Final Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project

August 2009

U.S. Department of the Interior
Bureau of Land Management
Ely District Office
Nevada

Cooperating Agency: Nevada Department of Wildlife

BLM

BLM Mission Statement

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

BLM/NV/EL/ES-GI08/05+1793

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
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TAKE PRIDE IN AMERICA

In Reply Refer To:
380910 NVL0100
N82888

Dear Interested Public:

Please find enclosed one copy of the Bald Mountain Mine, North Operations Area Project Final Environmental Impact Statement (FEIS), dated August 2009. This EIS evaluates the environmental impacts that would result from expanding and combining the existing Bald Mountain and Mooney Basin mines operated by Barrick Gold U.S. Inc. The project is located on public lands managed by the Egan Field Office, Ely District Bureau of Land Management (BLM) in northeast Nevada, approximately 65 miles northwest of Ely, White Pine County, Nevada. This document provides an evaluation of this proposed project in accordance with the National Environmental Policy Act of 1969 and associated regulations. The purpose of this document is to help the BLM Ely District Office and the cooperating agencies in their decision-making process.

The Proposed Action would result in combining the Bald Mountain Mine and Mooney Basin Plan of Operations boundaries to become the North Operations Area Project. The Proposed Action would result in an increase of disturbances from 4,160 acres to 8,085 acres. Existing facilities, including pits, rock disposal areas, heap leach pads, processing facilities, and interpit areas are proposed for expansion. New facilities under the Proposed Action would include one new pit, four new rock disposal areas, associated haul roads, topsoil stockpiles, and a remote truck shop facility.

Alternatives that were analyzed in this FEIS include the Proposed Action, No Action Alternative, Partial Backfill Alternative, and the Mooney Basin Heap Leach Pad Alternative. The Ely District's preferred alternative is the Partial Backfill Alternative because it meets the purpose and need while reducing environmental impacts.

The BLM compiled a Draft EIS that was issued to the public on December 19, 2008 with publication of the Notice of Availability (NOA) in the *Federal Register*. The NOA initiated a public comment period that ended on February 2, 2009. Public meetings were held on the Draft EIS in January 6-8, 2009 in Ely, Elko, and Eureka, Nevada. Individuals, public agencies, and non-profit organizations submitted 17 letters containing comments on the DEIS. The comments received and responses to these comments are contained in Appendix C of the FEIS. Some comments resulted in modifications to the EIS.

The publication of the NOA for the Final EIS in the Federal Register initiates a 30-day availability period. Following the 30-day availability period, the BLM may issue one or more Records of Decision based on the Final EIS. Persons wishing to provide BLM with comments

Lynn Bjorklund
Bureau of Land Management
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HC 33 Box 33500
Ely, Nevada 89301-9408

Email lynn_bjorklund@nv.blm.gov

Comments, including name and street addresses of respondents, will be available for public review at the Ely District Office during the regular business hours of 7:30 a.m. through 4:30 p.m., Monday through Friday, except holidays. You may request confidentiality if you are commenting as an individual, but you must state this prominently at the beginning of your written comments. Such requests will be honored to the extent allowed by law. Anonymous or illegible comments will not be considered. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be available for public inspection in their entirety.

If you have additional questions you can call Lynn Bjorklund at 775 289-1893.

Sincerely,

J. Weeks

Jeffrey A. Weeks
Field Manager
Egan Field Office

FINAL ENVIRONMENTAL IMPACT STATEMENT
BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT

LEAD AGENCY: U.S. Department of the Interior, Bureau of Land Management

COOPERATING AGENCIES: Nevada Department of Wildlife

JURISDICTION: White Pine County, Nevada

CONTACT INFORMATION: Correspondence on this Final Environmental Impact Statement should be directed to:

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ABSTRACT

This Final Environmental Impact Statement (EIS) evaluates the impacts on the environment that would result from the expansion of current mining operations at the Bald Mountain Mine. The proposed project would be located on public land located in White Pine County, Nevada, approximately 65 miles northwest of Ely, Nevada. The Proposed Action would include expansion of open pits, rock disposal facilities, heap leach facilities, and haul roads. The Proposed Action would also include development of one new pit and associated rock disposal facility, a truck shop, and top soil stockpiles. In addition, the Proposed Action would combine the existing Bald Mountain Mine Plan of Operations boundary and the Mooney Basin Operations Area boundary into one Plan of Operations, called the Bald Mountain Mine North Operations Area Project. This combined boundary would encompass 16,465 acres (approximately 16,392 acres are public land and approximately 73 acres are private land). The Proposed Action would result in an additional 3,920 acres of disturbance for a total of 8,085 acres of disturbance within the new Plan of Operations boundary.

Three alternatives were carried through in the analysis and include the No Action Alternative, Partial Backfill Alternative, and Mooney Basin Heap Leach Pad Alternative. The Ely District's preferred alternative is the Partial Backfill Alternative because it meets the purpose and need while reducing environmental impacts.

The BLM is responsible for administering mineral rights access on certain federal lands as authorized by the General Mining Law of 1872. The BLM Egan Field Office has the responsibility and authority to manage the surface and subsurface resources on public lands located within this division of the Ely District. The BLM must review the Plan of Operations to ensure use of public land in the Egan Resource Area is in conformance with BLM's Surface Management Regulations (43 Code of Federal Regulations 3809) and other applicable statutes, including the Mining and Mineral Policy Act of 1970 (as amended) and Federal Land Policy and Management Act of 1976 (as amended). This Final EIS satisfied the National Environmental Policy Act, which mandates that federal agencies analyze the environmental consequences of major undertakings.

Official Responsible for the Environmental Impact Statement:

Jeffrey A. Weeks — July 15, 2009
Field Manager, Egan Field Office — Date

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

SUMMARY

Barrick Gold U.S., Inc. (Barrick) proposes to expand current mining operations at several existing pits, rock disposal areas, heap leach pads, processing facilities, and interpit areas. The expansion would combine the existing Bald Mountain Mine (BMM) Plan of Operations boundary and the Mooney Basin Operations Area boundary into one Plan of Operations, called the BMM North Operations Area Project. In addition, new facilities under the Proposed Action would include a pit, rock disposal areas, haul roads, topsoil stockpiles, and a truck shop. The BMM North Operations Area Project is located in northeast Nevada, approximately 65 miles northwest of Ely, White Pine County, Nevada.

Barrick proposes to mine additional ore by expanding the existing pits, rock disposal areas, and associated facilities. New features include one additional pit, a remote truck shop, and an additional power line. All waste rock would be placed in expanded or new rock disposal areas. All ore would be trucked to one of two existing heap leach facilities for processing. Both heap leach facilities would be expanded under the Proposed Action.

The combined North Operations Area Project boundary would encompass 16,465 acres (approximately 16,392 acres are public land and approximately 73 acres are private land). Combining the two Plan of Operations boundaries would increase the existing plan boundaries by 3,738 acres. The current authorized disturbances for the BMM and Mooney Basin Operation Area projects are 3,418 acres and 742 acres, respectively. The Proposed Action would result in an additional 3,920 acres of disturbance for a total of 8,085 acres of disturbance within the new Plan of Operations boundary. All of the non-private land disturbed by the current project and proposed under the BMM North Operations Area Project is administered by the Bureau of Land Management (BLM).

Nine alternatives to the Proposed Action were identified and considered during the scoping process. Three of the nine identified alternatives were carried through the analysis. The six alternatives not carried through the analysis were eliminated because they did not meet the Purpose and Need, were not feasible, and/or did not provide an environmental benefit. The three alternatives carried through in the analysis included the Partial Backfill Alternative, the Mooney Basin Heap Leach Pad Alternative, and the No Action Alternative.

The Partial Backfill Alternative (Alternative A, BLM Preferred Alternative) would include partial backfill of up to six open pits. This would result in smaller rock disposal areas by reducing the quantity of material they would contain. All other operations would remain the same as identified in the proposed Plan of Operations Action. The Mooney Basin Heap Leach Pad Alternative (Alternative B) would include a redesign of the Mooney Basin leach pad to reduce the disturbance footprint. To accommodate the smaller footprint, the BMM pad would be modified to facilitate additional ore. All other operations under the proposed Plan of Operations Action would be the same. The No Action Alternative would result in operations continuing under the existing approved Plans of Operations. Under the current approved Plan of Operations, it is anticipated that activities would be completed in 2009 for both the BMM and Mooney Basin Operations Area.

The resources addressed in this Final Environmental Impact Statement (FEIS) are identified in the following sections, which include a summary of the important issues and impact conclusions for each resource. Additional details are provided in Chapters 3.0 and 4.0.

Water Resources

<u>Surface Water</u>

Surface water is limited in the Proposed Action area due to the lack of seeps and springs, low precipitation, and high evaporation rates. There are no perennial drainages within the Proposed Action boundary. All the drainages are ephemeral. In general, established background water quality levels are good with the exception of arsenic, which exceeds the 0.05 mg/l Nevada water quality standard.

Issues:

- Increases in wind and water erosion from disturbed areas leading to increased sedimentation of drainages;
- Potential drainage from rock disposal areas;
- Spring recharge reduction; and
- Contamination of surface water from chemical spills.

Conclusion:

Implementation of appropriate Best Management Practices such as interim seeding of stockpiles, diversion channels, straw bales, silt fences, and sediment ponds would eliminate or minimize the potential impacts associated with increasing sedimentation to the ephemeral drainages in the Proposed Action area.

The Proposed Action would include expansion of existing pits, with one new pit planned. Since the Proposed Action is primarily an expansion of existing pits, waste rock is expected to be similar in nature to waste rock that has previously been encountered. Ongoing monitoring under the existing Water Pollution Control Permit would continue to be used to characterize the waste rock from the open pits. Based on current testing, no impacts from water with low pH and/or high metals content seeping from the rock disposal areas are anticipated.

A decrease in recharge to one spring located within the Plan of Operations boundary may occur due to the placement of waste rock. A portion of the recharge area for Cherry Spring would be covered with waste rock. This may result in a reduction in the amount of recharge to Cherry Spring due to water entrained within the rock. This may lower the water level of the local aquifer feeding the spring. It is noted that recently no water has emanated from Cherry Spring and recent monitoring from a development pipe indicates water is well below the surface.

Current chemical handling practices used by Barrick would continue to be followed to assure proper handling of solvents, fuels, and other chemicals. In the event of a spill, the Spill Prevention Control and Countermeasures Plan would be followed to address emergency response, notifications, and cleanup of spilled material.

<u>Groundwater</u>

Two groundwater systems have been identified by Mine Mappers (2007): a local groundwater system including deep bedrock zones and an alluvial fill groundwater system located in the valleys. The groundwater quality is generally good with arsenic levels generally at or near applicable Nevada standards.

Issues:
- Increased withdrawal of groundwater for processing;
- Intersection of local groundwater by open pits; and
- Degradation of groundwater quality.

Conclusion:
The Proposed Action would result in an increase in the current groundwater production rates to meet the demand for processing water. The anticipated increase is approximately 250 acre-feet per year, for a total of approximately 550 acre-feet per year. The estimated radii of the cones of depression for the BMM and Mooney Basin wells are 202 feet and 138 feet, respectively. There are no other water users, seeps and springs, or other water features within the cones of depression for the water production wells; thus no impacts to other groundwater users would result from the proposed increase in water production. No impacts to groundwater associated with the Ruby Lake National Wildlife Refuge would occur as a result of the Proposed Action.

Interception of the deeper groundwater aquifer is not anticipated since the bottom of the open pits would lie above the identified potentiometric surface. The pits may encounter isolated occurrences of saturated material, but the amount of water is anticipated to be small. Characterization of pit wall rock has indicated that degradation of water contacting this wall rock would not occur. If water is encountered in saturated zones, the water would be pumped out of the pit and handled in a manner consistent with the Water Pollution Control Permit.

No impacts to water quality from the heap leach pads are anticipated as they are double lined with leak detection systems. Operations of the leach pads would be similar to current operations although the leach pads would be expanded.

Geology and Minerals
Mining has occurred in the Bald Mountain Area since the late 1800s. Minerals recovered include copper, antimony, silver, and gold. Most of the early mining occurred next to a small granitic intrusion south of Big Bald Mountain. Large-scale commercial gold mining began in the area in 1976 at the Alligator Ridge Mine. Previous and current mining operations have occurred in five areas resulting in 26 open pits, 30 rock disposal areas, 10 heap leach pads, and seven process ponds. Sedimentary rock in the Proposed Action area consists of Paleozoic limestone, dolomite, shale, quartzite, siltstone, and sandstone. These have been intruded by Mesozoic age granitic porphyry, which is directly associated with the districts wide alteration.

Issues:
- Removal of ore and waste rock; and
- Future availability of mineral resource.

Conclusion:
Approximately 200 million tons of ore and 830 million tons of waste rock would be removed during the expansion of the existing pits and creation of one new pit and the known gold reserve would be depleted. Waste rock would be permanently placed in one of the existing (expanded) or proposed new rock disposal areas or used to backfill portions of one or more of the open pits. The ore material would be permanently removed and placed on one of the two existing but expanded heap leach pads. The rock disposal areas and heap leach pads would be reclaimed following cessation of mining and processing operations.

Paleontology
No fossils have been identified in the BMM or Mooney Basin areas that have been classified as rare or important. The presence of fossils is uncommon in the vicinity of the Proposed Action

area, most likely due to the regional metamorphic activity. Fossils that have been discovered primarily include algae and invertebrates from the Cambrian period. Fossils in other period rocks include waterfleas, echinoderms, bryozoans, foraminiferans, and algae.

Issues:
- Loss of paleontological resources by removing rock containing fossils.

Conclusion:
No impacts to significant or critical fossil resources that require protection are anticipated with implementation of the Proposed Action, as none are known to exist in the area of the Proposed Action.

Soils
There are 16 soil associations present within the Proposed Action area, based on the Natural Resource Conservation Service Soil Survey of Western White Pine County (NRCS, 1998). The physical and chemical properties of the soils were evaluated to identify factors that may limit successful reclamation. It is estimated that 7.3 to 11.7 million cubic yards of growth medium would be available for salvage in the 3,920 acres to be disturbed under the Proposed Action.

Issues:
- Loss of productive topsoil in disturbed areas;
- Increased erosion from wind and water; and
- Contamination of soil from chemical spills.

Conclusion:
Approximately 3,920 acres of disturbance to soils would occur with approval of the Proposed Action. This disturbance would include removal of the salvageable growth medium, resulting in impedance of soil development and reduction or elimination of biological activity during stockpiling of the material. After placement of the salvaged soil during reclamation, soil biological activity would slowly increase to pre-disturbance levels. The original soil structure would be permanently altered; however, new soil profiles would develop over time.

Removal of soil and stockpiling the soil for use during reclamation would result in an increased risk of wind and water erosion. Use of appropriate Best Management Practices such as revegetation of stockpiles, silt fences, straw bales, and sediment basins would minimize soil losses from water and wind erosion. In addition, use of water or binding agents on disturbed areas (roads, rock disposal areas, etc.) would be used to minimize dust generation and off-site deposition.

Current chemical handling practices used by Barrick would continue to be followed to assure proper handling of solvents, fuels, and other chemicals. In the event of a spill, the Spill Contingency Plans and Emergency Response Plans would be followed to address emergency response, notifications, and cleanup of spilled material.

Vegetation Resources
Four vegetation community types were identified within the BMM North Operations Area Project boundary: pinyon-juniper woodland, big sagebrush, low sagebrush, and mountain brush. The most abundant communities within the plan of operations boundary are the pinyon-juniper (7,482 acres) and big sagebrush (7,940 acres). Approximately 2,131 acres of the plan of operations boundary has burned within the last eight years. No individuals or habitat for threatened, endangered, or sensitive plant species were identified in the Proposed Action area.

Issues:
- Removal of vegetation;
- Increase of vegetation diversity following reclamation;
- Increased potential for establishment of non-native invasive species;
- Short-term loss of forage for wildlife and livestock; and
- Increased potential for soil erosion.

Conclusion:
Direct impacts to vegetation would include the removal of approximately 3,920 acres of vegetation including 1,712 acres of pinyon-juniper woodland, 1,917 acres of big sagebrush, 72 acres of low sagebrush, and 219 acres of mountain brush. A majority of the disturbance area, with the exception of the pit disturbance (540 acres), would be reclaimed including seeding with the approved seed mix. With successful revegetation, the habitat diversity would increase since much of the reclaimed areas would be dominated by grasses and shrubs.

Indirect impacts associated with vegetation removal include the potential establishment of noxious and, non-native invasive species, short-term loss of forage for wildlife and livestock, and a potential increase in soil erosion.

Non-Native Invasive Species
Both noxious weeds and non-native invasive species are present within the Proposed Action area. Eight noxious weed species are currently present in and around the Proposed Action area. One species, spotted knapweed (*Centaurea stoebe*), is classified as a Class A species, for which the State of Nevada emphasizes complete control. Three species - musk thistle (*Carduus nutans*), Russian knapweed (*Acroptilon repens*), and Scotch thistle (*Onopordum acanthium*) - have a Class B rating, and the State of Nevada emphasizes control of population spread and decreased population size. Four species - black henbane (*Hyoscyamus niger*), salt cedar (*Tamarix* spp.), hoary cress (*Lepidium draba*), and Canada thistle (*Cirsium arvense*) - are Class C species, for which the State of Nevada emphasizes management to control population size. Non-native invasive species identified within the Proposed Action area include cheatgrass (*Bromus tectorum*), bull thistle (*Cirsium vulgare*), and Russian thistle (*Salsola kali*).

Issues:
- Increased potential for establishment of noxious weeds and non-native invasive species.

Conclusion:
The Proposed Action would increase the potential for noxious and non-native invasive weeds to become established in disturbed areas and eventually spread into undisturbed areas within the Proposed Action area. Impacts are anticipated to be negligible with continued implementation of applicant-committed environmental protection measures identified in Chapter 2.

Wildlife Resources
Wildlife present in the Proposed Action area is typical of species in the northern part of the Basin and Range physiographic province. Big game species are represented by mule deer, elk, and antelope, with mule deer the most abundant of the three. Game birds are represented by sage grouse, chukar, gray partridge, and mourning doves. There are numerous other species present in the area including a variety of birds, mammals, and reptiles. Although some amphibians may be present, habitat for amphibians is limited due to limited water resources.

Numerous migratory birds utilize habitat within the Proposed Action area. The avian composition and density varies with season and habitat type, with the highest density and diversity occurring in the spring and early summer.

No federally listed species are known to occur in the Proposed Action area. There are a number of state-protected and BLM sensitive species that have the potential to occur in the Proposed Action area. These include a variety of raptors and bats, pygmy rabbits, sage grouse, two reptile species, and a variety of other birds.

Issues:
- Loss of habitat;
- Injury or mortality from land-clearing activities and increased traffic;
- Displacement from habitat due to human activity;
- Hindrance to deer migration;
- Bird nests and or young being destroyed; and
- Creation of habitat (steep cliffs as a result of open pits) that is currently limited and conversion of habitat.

Conclusion:
Direct impacts to wildlife resources would include loss of habitat as a result of disturbance to an additional 3,920 acres. The majority of this disturbance would occur in the pinyon-juniper woodland and big sagebrush community types. Approximately 219 acres of mountain brush habitat, which is good deer-foraging and cover habitat, would be impacted by the project. Land-clearing activities could result in the mortality of smaller and less mobile animals. Indirect effects would include some species being forced to adjacent areas due to human presence and disturbance, thus increasing competition for resources in these areas.

The Nevada Department of Wildlife (NDOW) has expressed concern that the Proposed Action may restrict deer movement in the Ruby Mountains by constricting the migration corridor. This constriction would have the greatest potential to occur during winters with heavy snow accumulation, when deer move to wintering grounds in the Little Antelope Summit area. To date, no obvious barriers to deer movement have been observed during the current operations.

Conversion of pinyon-juniper habitat to grass-shrub habitat after reclamation would provide better forage habitat for some species of wildlife.

The Proposed Action would result in the loss of 3,920 acres of vegetation that would be unavailable to nesting birds during operation. Reclamation of disturbed areas would return the area to productive nesting habitat. To avoid direct impacts to migratory birds, Barrick would conduct land-clearing activities outside of the avian breeding season or conduct nesting bird surveys immediately prior to land-clearing activities. If occupied nests are identified, disturbance would be avoided or a buffer zone around the nest would be established until the young have fledged.

Because no threatened or endangered animal species, or habitat for these species, have been identified in the Proposed Action area, no impacts are anticipated. There are a number of Nevada state-protected animal species and BLM sensitive animal species that have potential to occur within the Proposed Action area. The majority of these species are bats and birds, including all raptors (eagles, hawks, and owls). Other sensitive species include the pygmy rabbit (*Brachylagus idahoensis*) and sage-grouse (*Centrocercus urophasianus*).

The Proposed Action could result in the loss of foraging habitat and roosting habitat for tree-roosting bats, some of which are listed by the State as protected or by the BLM as sensitive. Underground workings, as well as cliffs, are limited in the Proposed Action area, but several bats such as the pallid bat (*Antrozous pallidus*) and Townsend's big-eared bat (*Corynorhinus townsendii*), which are strong fliers, may lose a limited amount of foraging habitat. No raptor nests were identified in the Proposed Action area; thus impacts to diurnal raptors, owls, and turkey vultures would be limited to the loss of foraging grounds due to land-clearing activities and the presence of humans. Following cessation of mining activities, pit highwalls would provide nesting habitat for some raptors and roosting habitat for bats.

Potential habitat for pygmy rabbits, a BLM-sensitive species, exists primarily in the western part of the Proposed Action area, which has been previously disturbed by the BMM Heap Leach Pad and processing facilities. Additional disturbance would occur in pygmy rabbit habitat near the existing 2/3 Heap Leach Pad. Areas with pygmy rabbit habitat would be surveyed prior to disturbance. The BLM sensitive species ferruginous hawk (*Buteo regalis*) and burrowing owl (*Speotyto (Athene) cunicularia*) are known to nest in the vicinity but not within the Proposed Action area. Vegetation removal would reduce the foraging habitat for these species. The removal of pinyon-juniper trees would also reduce the nesting habitat for the pinyon jay (*Gymnorhinus cyanocephalus*), juniper titmouse (*Baeolophus ridgwayi*), and other woodland-dependent and cavity-nesting species.

Steep hillsides and cliffs are limited in the area, thus limiting nesting and roosting habitat for a number of bird species and bats. The creation of pits during mining would increase the availability of steep slopes and cliffs in the Proposed Action area.

Wetlands, Riparian Zones, and Waters of the U.S.
There are few small isolated wetland areas that are associated with seeps and springs within and near the Proposed Action area. No riparian zones or jurisdictional waters of the U.S. (including jurisdictional wetlands) were identified within the Proposed Action area. Therefore, no impacts would occur to riparian zones and waters of the U.S.

Issues:
- Potential destruction of isolated wetlands;
- Increase sedimentation from erosion; and
- Alteration of recharge areas to wetland areas.

Conclusion:
Disturbance to all seeps and springs identified in the Proposed Action area would be avoided by design; thus no direct disturbance to wetlands would occur with implementation of the Proposed Action. Land-disturbing activities upgradient of wetland areas would use proper Best Management Practices such as sediment traps, straw bales, or silt fences to minimize sedimentation to downgradient areas.

Alteration of recharge areas is discussed in the water resources section. Since wetlands do not exist at the Cherry Spring site, no impacts would occur to wetland areas as a result of alterations to this recharge area.

Range Resources
The Proposed Action area lies wholly within the existing Warm Springs livestock grazing allotment. The existing Warm Springs allotment is 330,966 acres in size. The allotment is currently categorized as "I," which indicates "improve the current unsatisfactory condition." The Warm Springs Allotment is managed for an active grazing preference of 7,709 animal unit months. Successful reclamation would result in improved forage areas as much of the area would be reclaimed to grass and shrub vegetation.

Issues:
- Loss of forage;

- Restricted access; and
- Improved forage following reclamation.

Conclusion:
Disturbance of 3,920 acres of the allotment would result in a temporary loss of 98 animal unit months. This represents less than two percent of the active grazing preference of the Warm Springs Allotment. With reclamation, a permanent loss of 28 animal unit months would result from the expansion of the pits and pit berms.

Wild Horses
The Proposed Action area lies within the Triple B Herd Management Area. Wild horses generally use the Buck and Bald mountains as summer range while moving into Newark, Long, and Huntington valleys during the winter months.

Issues:
- Loss of forage;
- Displacement as a result of human activity;
- Mortalities due to collision with vehicles; and
- Improved forage following reclamation.

Conclusion:
Impacts to wild horses in the Buck and Bald Herd Management Area are expected to be minimal. Approximately 3,920 acres would be disturbed with implementation of the Proposed Action. This loss of forage would occur during the life of the project. Successful reclamation would result in improved forage areas as much of the area would be reclaimed to grass and shrub vegetation. Short-term displacement of horses would occur in the vicinity of Proposed Action as a result of human activity. It is likely that wild horses would become accustomed to the activity prior to cessation of operations. Mortalities due to collisions with vehicles may also occur. Vehicular impacts with wild horses should be minimal with enforced speed limits and minimized traffic through the use of buses to transport mine employees.

Land Use and Access
Land uses in and around the Proposed Action area consist primarily of ranching (livestock grazing), wildlife habitat, mineral exploration, mining, and recreation (hunting, etc.). There are several rights-of-way for power lines, roads, and pipelines in the area. The White Pine County Land Use Plan, the purpose of which is to coordinate planning on public lands with federal land management agencies, specifically encourages mineral exploration and development on public lands.

Issues:
- Conflicts with existing land use authorizations;
- Restricted access; and
- Increased traffic on roads.

Conclusion:
The Proposed Action would result in combining and expanding the existing BMM and Mooney Basin Operations Plans of Operations boundaries by 3,738 acres, thus potentially removing the land from public use during active mining and reclamation. There are existing land use authorizations including rights-of-way, roads, communications sites, oil and gas leases, and water facilities (troughs, pipelines, storage tanks) within the Proposed Action area. Conflicts with existing land use authorizations would be resolved through consultation with the holders of those land use authorizations.

Public access would be restricted in areas of active mining and processing for the life of the mine. Access to all areas, except the 540 acres associated with the open pits, would be restored following completion of reclamation. Effects associated with increased traffic are expected to be minimal as Barrick buses most employees to the mine site. Barrick anticipates that only one additional bus would be needed to accommodate the additional workers under the Proposed Action. It is anticipated that additional deliveries would be needed to supply the expanded activities. With the increase in deliveries, an estimated 1,500 trips per year would occur, which is a 10 to 15 percent increase from current deliveries.

It is anticipated that this slight increase in traffic on the access roads would have only a minimal impact on the condition of the state and county roads. Barrick proposes to continue its program of maintenance of unpaved access roads for the life of the mine.

Recreation

For the fiscal year ending September 30, 2007, there was an estimated 297,895 visitor days to public land in the BLM Ely District. Most recreational activities consist of dispersed uses such as off-highway vehicle use, hunting, fishing, camping, cross country skiing, horseback riding, caving, rock climbing, and mountain biking. Recreational usage of public lands in the BLM Ely District has been increasing, partly because of population growth in both the BLM district and in Las Vegas.

Issues:

- Restricted access.

Conclusion:

The existing Plans of Operations area would expand from 12,727 acres to 16,465 acres. This would result in restricted access for hunting and other recreation activities from active mining acres for the life of the mine. This restriction is expected to have negligible adverse impact to recreation activities because current levels of recreation in the area are low and there is an abundant amount of open public land in the BLM Ely District. No impacts would occur to access to facilities around the Proposed Action area such as Ruby Lake National Wildlife Refuge.

Air Quality

The direct impact analysis area for air quality includes a zone around the current and proposed mining activity defined by a 12-mile radius and a 200-yard-wide corridor along the primary access routes to the Proposed Action area. The entire analysis area is currently in attainment or unclassified for all criteria air pollutants. The closest sensitive receptor to the Proposed Action area is the Ruby Lake National Wildlife Refuge, which is approximately 25 miles north of the Proposed Action area. Current operations and emissions qualify the facility as a Nevada Class II source. The nearest Class I airshed is the Jarbidge Wilderness area, which is 130 miles to the north near the Idaho border. The existing BMM is operated as a Class II source with emissions below the Prevention of Significant Deterioration major source threshold.

Issues:

- Impacts to air quality.

Conclusion:

With implementation of the Proposed Action, emissions from the operations would remain a Class II source with emissions below the Prevention of Significant Deterioration major source threshold. Based on the potential to emit values from the stationary sources, the Proposed Action would qualify as a Nevada Class II source. Dispersion modeling was conducted for the four criteria air pollutants (PM_{10}, carbon monoxide, nitrogen oxide, and sulfur dioxide) to determine the dispersion of these pollutants and potential impacts beyond the Proposed Action area. The dispersion model indicated that all predicted maximum impacts would occur within the Proposed Action area, miles short of the nearest residence or area of regular human activity. In addition, the furthest extent of significant contributions from the Proposed Action ended well short of the Jarbidge Wilderness and all other Class I areas.

Mercury emissions would result from fugitive dust generated during mining and processing activities and through thermal sources, primarily from the two refining processes. Mercury emissions would continue to be controlled as required by the Nevada Mercury Control Program. The mine's estimated mercury emissions from the existing thermal sources are 57.7 pounds per year. Annual mercury emission from fugitive dust is estimated at 0.27 pound per year.

Impacts to air quality from operational activities are expected to be similar to those of the existing operations. There would be a slight change in the location of activity and emissions across the mine property. Ambient air quality standards would be met everywhere at and beyond the project ambient air boundary. Additional supply vehicles could result in slight increases in tailpipe emissions of organic volatile compounds, carbon monoxide, and nitrogen oxide.

Visual Resources
The Proposed Action area is bound by Newark Valley and Huntington Valley on the west and by Long Valley on the east. Vegetation consists primarily of gray-green sagebrush in the low elevations and dark green (pinyon-juniper woodland) vegetation in the higher elevations. Past mining activity in the area has created areas of contrast to the surrounding landscape with disturbance visible from valleys to the east and west of the existing operation.

Four Key Observation Points were identified to determine the visual impact from the Proposed Action: (1) the intersection of the Pony Express Trail with State Route 892 (west of the Proposed Action), (2) near the Pony Express Trail north of the slopes of Big Bald Mountain approximately three miles from the Proposed Action, (3) Ruby Marsh Road approximately 2.2 miles east of the Proposed Action, and (4) Ruby Marsh Road inside the eastern boundary of the Proposed Action near the existing Mooney Basin Heap Leach Pad.

Issues:

- Changes in line, form, color, and texture from mine-related disturbance.

Conclusion:
During active mining, views from all Key Observation Points would not meet management objectives because of moderate contrast with the existing landscape. Following successful reclamation, contrast would be reduced, disturbed areas would not attract the attention of viewers, and management goals would be met.

Noise and Vibration
The primary natural noise source in the area of the Proposed Action is wind. This noise, with the addition of the man-made noise associated with the current mining operation, constitutes the baseline condition. There are few receptors within audible range of the existing mine. Intermittent blasting is typically the only noise that can be faintly heard by the closest human receptors at residences.

Issues:

- Increased noise and vibration from earth moving, blasting, drilling, and increased traffic.

Conclusion:
Noise from construction and operational activities is not expected to differ significantly from existing operations. The Proposed Action would result in a minimally different noise profile from current on-site activities. The noise profile would be expected to be unnoticeable or minor at the closest residence as a result of the distance from the mine.

Socioeconomics
The three primary areas identified for the socioeconomic analyses are White Pine, Elko, and Eureka counties, all of which are predominantly rural and without large urban centers. The economies of these counties tend to follow the cycle of the precious metal mining industry. Elko is the largest with regard to land and population of the three counties. Employees at the existing operation live primarily in the towns of Elko, Ely, and Eureka.

Issues:
- Changes in employment;
- Changes in income; and
- Increased demand for housing and services.

Conclusion:
The staffing level of the Proposed Action is expected to increase to a maximum of about 325 employees, which represents a 50 percent increase over current employment. White Pine County would be the recipient of the mine's ad valorem tax payments and would receive a share of the net proceeds tax. This additional source of income would assist White Pine County in stabilizing its finances. All three counties (White Pine, Eureka, and Elko) would benefit from local spending by residents employed by the mine. Modeling indicates that with 110 additional employees, an additional 33 indirect and 50 induced jobs would be created in the three-county area. The model indicates that the value of the direct, indirect, and induced annual labor income would be $9.9 million in 2006 dollars.

New employees are assumed to be distributed among the three closest cities (Ely, Eureka, and Elko) depending mainly on the availability of housing. If all 110 new employees came from outside the three counties, which is unlikely, the population could increase by approximately 330 persons. Because few new employees are likely to find housing in Eureka, the majority of the new employees would reside in either Ely or Elko. It is anticipated that the majority of employees from outside the area would likely reside in Elko. With this scenario, the effect on housing and county infrastructure demand would be manageable.

Environmental Justice
Analysis of the minority population and low-income population indicate that there is no meaningful difference between these populations in the three counties (White Pine, Eureka, and Elko) and the State of Nevada.

Issues:
- Disproportionate effect on minorities and low income populations; and
- Undue burden on children.

Conclusion:
Initial analysis of the potential effects of the Proposed Action would not be expected to have a disproportionate effect on any particular population nor place any undue burden on children. In addition, no traditional cultural properties or sites meeting the criteria of Executive Order 13007 (Indian Sacred Sites) were identified in the Proposed Action area.

Cultural Resources (Prehistoric and Historic)
A Programmatic Agreement was developed to assist BMM, the BLM, and the Nevada State Historic Preservation Office with identifying, evaluating, and treating cultural resources when necessary. Of the proposed 3,920 acres of new disturbance, the location for 100 acres of exploration disturbance has not been identified, leaving a total of 3,820 acres of identified disturbance. Of these 3,820 acres, only 503 acres remain unevaluated, while 2,198 acres were surveyed within the last ten years and 1,119 acres were surveyed more than ten years ago.

Previous surveys have identified 270 prehistoric sites within the Proposed Action area with 95 of those sites within the proposed disturbance area of the Proposed Action. Previous surveys also identified 109 historic sites within the Proposed Action area with 30 of those sites within the proposed disturbance area of the Proposed Action.

Issues:
- Disturbance to both prehistoric and historic sites leading to loss of cultural resources.

Conclusion:
All eligible sites that would be impacted by the Proposed Action would be treated in accordance with the Programmatic Agreement between the BMM, BLM Egan Field Office, and Nevada State Historic Preservation Office.

Native American Religious Concerns
No traditional cultural properties or sites meeting the definition identified in Executive Order 13007 (Executive Order on the Indian Sacred Sites) have been identified within the Proposed Action area. Therefore, no impacts affecting Native American Religious concerns are anticipated from implementation of the Proposed Action.

Hazardous and Solid Waste/Hazardous Materials
A number of fuels and reagents are transported to the site, stored on site, and used on-site for mining and processing ore. These include diesel fuel, ethylene glycol, methanol, propane, sodium cyanide, ammonium nitrate, fuel oil, sodium hydroxide, calcium oxide, and hydrochloric acid. Transport, storage, and use of these chemicals are regulated by federal, state, and local laws and statutes. As part of the current operations, BMM has existing Spill Contingency Plans and Emergency Response Plans that address response to hazardous material spills, notification procedures, and spill cleanup procedures. Previous spills at the BMM and Mooney Basin Operations Area have been reported to the appropriate regulatory agencies and properly cleaned up as per the Emergency Response Plans, Spill Contingency Plans, and other requirements from the regulatory agencies.

Non-hazardous, solid waste is currently managed on-site in a Class III–waivered landfill. This facility was constructed and is managed in accordance with all applicable state regulatory requirements. A new Class III–waivered landfill would be constructed on a portion of the Saga rock disposal area.

Issues:
- Accidental release during on-site storage, use, or transportation to or from the site.

Potential resources that could be affected by an accidental spill of hazardous materials or solid and hazardous waste include air, water, soil, and biological resources. The chemicals currently being used at the existing operation are the same as those identified to be used with the Proposed Action. Deliveries of the chemical materials and waste would primarily be via State

Route 278 from Carlin to Eureka, to U.S. Highway 50 to State Route 892, or U.S. Highway 50 to Ruby Marsh Road.

The existing Class III–waivered landfill would continue to be used with a second Class III landfill proposed in the Mooney Basin area. Class III–waivered landfills can accept only non-hazardous waste generated by the mine. All other waste would be recycled off-site or disposed of at a licensed facility.

Conclusion:
The probability of an accident involving hazardous materials or hazardous waste was calculated using the national accident statistics for truck shipments of hazardous materials, haul distances, and the number of deliveries per year. The probability of an accident is as follows: sodium cyanide – 44.5 in 1,000; diesel fuel – 162.6 in 1,000; hydrochloric acid – 0.4 in 1,000. These numbers represent the number of spills estimated per 1,000 deliveries. These results indicate a low probability of an accidental release during transport of these materials during the life of the Proposed Action. There is a limited distance along the transportation route (approximately one mile) of sensitive receptors (wetlands, streams, etc.); thus a release into these areas is not likely. The environmental effects of a release would depend on the substance, quantity, timing, and location. The range of effects would be minor for a spill at the project site (equipment immediately available to limit spill) to a large spill during transport that could immediately impact water quality and aquatic life, if spilled into a flowing stream. Considering the transport routes and their limited extent within range of sensitive receptors, the likelihood of a major spill into a flowing stream is considered low.

BLM Preferred Alternative
The BLM's preferred alternative, based on the information from the scoping process and information contained within this FEIS, is the Partial Backfill Alternative (Alternative A) as described in Section 2.5.2. The selection of this alternative is the one that the BLM believes best fulfills the agency's statutory requirements and responsibilities. The selection of this alternative takes into consideration environmental, economic, and technical factors.

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

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Chapter 1
Introduction

1.1 Overview

A Plan of Operations for the proposed Bald Mountain Mine - North Operations Area Project has been submitted by Barrick Gold U.S., Inc. (Barrick) to the Bureau of Land Management (BLM) Egan Field Office, in compliance with 43 Code of Federal Regulations Subpart 3809. The Plan of Operations details the proposed expansion of the existing Bald Mountain Mine (hereafter referred to as BMM) and Mooney Basin operations including the expansion of six open pits, the addition of rock disposal areas, a truck shop, and growth medium stockpiles. In addition, the Plan of Operations proposes to combine the existing Plans of Operations for the BMM and the Mooney Basin Operations Areas. The BMM and Mooney Basin Operations Areas are located approximately 65 air miles northwest of the town of Ely, Nevada, in White Pine County (Figure 1-1). The Proposed Action area encompasses portions of Townships 23 and 24 North, Ranges 56, 57, and 58 East.

This Environmental Impact Statement (EIS) is being prepared in compliance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality regulations for implementing NEPA (40 Code of Federal Regulations 1500 – 1508) and in accordance with the BLM NEPA Handbook H-1790-1 (BLM, 2008) and applicable instruction memoranda.

Chapter 1 explains the Purpose and Need for the Proposed Action, the issues surrounding the action, and other introductory information. It also discusses how the project relates to the *Ely District Record of Decision and Approved Resource Management Plan* (BLM, 2008), NEPA, and the authorities guiding the EIS process. **Chapter 2** describes the Proposed Action and alternatives including the No Action Alternative. The No Action Alternative would continue the management direction established by the *Bald Mountain Mine Expansion Project Final Environmental Impact Statement* prepared in September 1995 (BLM, 1995a) and subsequent approved Record of Decision (BLM, 1995b), as well as final Environmental Assessments for expansions of Mooney Basin (BLM, 2003a) and BMM (BLM, 2005b). **Chapter 3** describes the affected environment and predicts the direct and indirect environmental consequences of the Proposed Action and each management alternative that are likely to occur. Cumulative impacts are described in **Chapter 4**. **Chapter 5** provides the consultation and coordination information used in preparation of this document, as well as a list of FEIS preparers. **Chapter 6** contains the list of references cited, abbreviations, and acronyms. **Appendices** include Appendix A - a list of relevant plans, statutes, regulations, executive orders, and management plans; Appendix B - public scoping documents; Appendix C – Public Comments and Response to Comments; Appendices D - Standard Bureau of Land Management Best Management Practices; Appendices E through I - supporting analysis information; Appendix J - Programmatic Agreement for Cultural Resource Protection at Mine Sites.

This FEIS describes the environmental consequences of implementing the Proposed Action and the identified alternatives.

1.2 Project History

Between 1869 and 1956 the Bald Mountain Mining District produced gold, silver, copper, antimony, and tungsten. Larger scale exploration and mining activities began in the 1970s within the BMM area and Mooney Basin Operations Area. In 1976, Placer Dome U.S. acquired an option on claims within the Bald Mountain Mining District and initiated exploration for precious metals. A pilot-scale heap leach project was initiated at BMM in 1983 and was upgraded to a commercial heap leach facility in 1985. Large scale activities at BMM have been expanded periodically since the commercial processing facility was initiated. In September 1995, the BMM EIS was finalized for the expansion of pits, rocks disposal areas, roads, and ore-processing facilities (BLM, 1995a). Approved Plan of Operations amendments during the period from 1997 to 2005 included new/expanded pits, rock disposal areas, haul roads, and the Top Area underground facilities (Table 1-1).

The original Plan of Operations for the Mooney Basin Operations Area was submitted to the BLM in March 1994 and approved in 1995 (BLM, 1995a). Approved facilities include a heap leach pad and process facilities, rock disposal areas, pits, haul roads, and exploration disturbance. Several amendments were completed during the period from 1998 to 2005, including a 2005 Mooney Basin amendment for an expansion and modification to the heap leach facility and haul roads (Table 1-1).

TABLE 1-1 PROJECT NEPA HISTORY

PROJECT	3809/NEPA ACTIONS ENVIRONMENTAL ASSESSMENTS/EIS	APPROVAL DATE	NEPA DOCUMENT NO.
Bald Mountain (N-68193)	Bald Mountain Mine Expansion Project EIS	September 1995	NV-040-1995 FEIS
	1995 Plan of Operations (LJ Ridge)	March 1997	NV-040-97-12
	2005 Bald Mountain Mine Expansion Environmental Assessment	November 2005	NV-040-006-005 N-78825
Mooney Basin (N-78822)	Bald Mountain Mine Expansion Project EIS	September 1995	NV-040-1995 FEIS
	2003 Mooney Basin Expansion Environmental Assessment	March 2004	NV40-03-032
	2005 Plan of Operations and Reclamation Permit Amendment	March 2005	N-78822

The existing BMM and Mooney Basin Operations Area projects have been previously analyzed under the BMM EIS (BLM, 1995a), the *Mooney Basin Expansion Project Environmental Assessment* (BLM, 2003a), the *Final Bald Mountain Mine 2005 Expansion Environmental Assessment*, and a 2005 Plan of Operations and Reclamation Permit Amendment (Table 1-1). Previous NEPA actions authorized the disturbance of 3,418 acres within the BMM Plan of Operations boundary and 747 acres within the Mooney Basin Operations Area Plan of Operations boundary (a total of approximately 4,165 acres). Figure 1-2 shows the BMM and Mooney Basin Operations Area Plans of Operations boundaries and existing approved facilities.

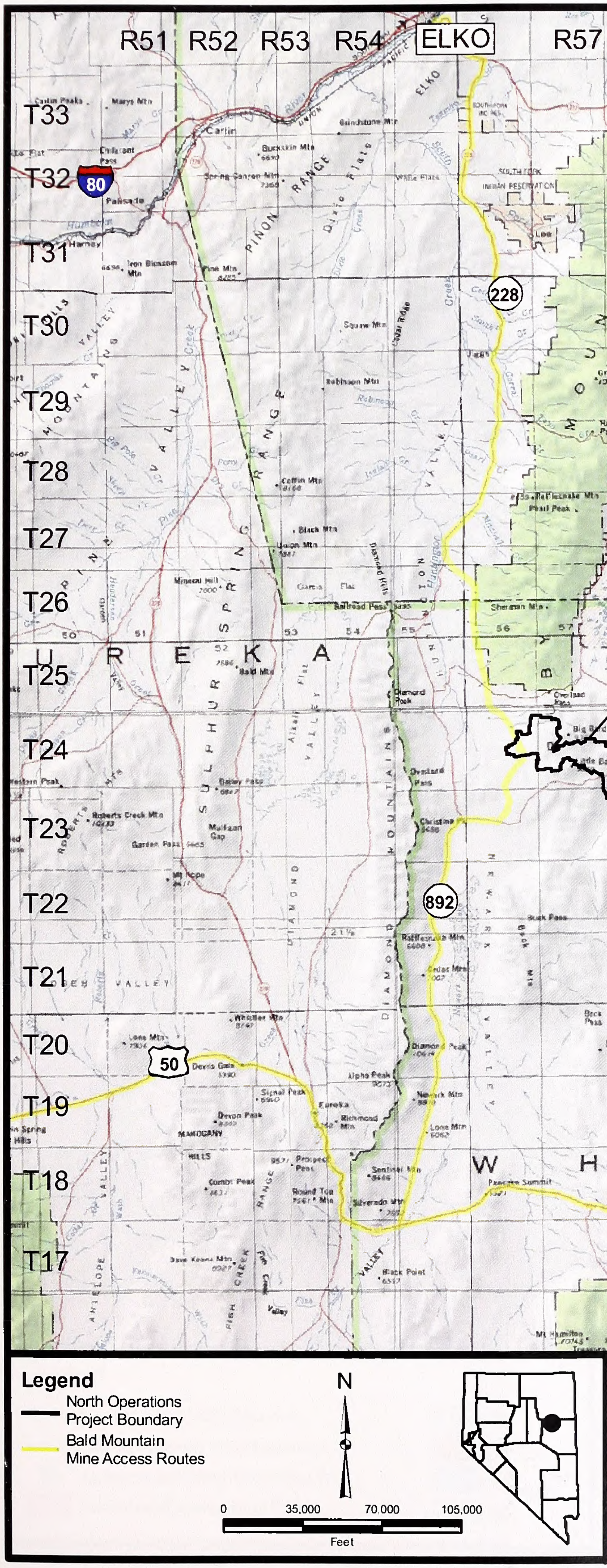
1.3 Purpose and Need for Action

1.3.1 Introduction

Council on Environmental Quality regulations state that the document shall briefly specify the underlying purpose and need to which the agency is responding. The applicant's purpose and need must not be confused with the BLM purpose and need for the action. The PURPOSE is the goal or objective that would be achieved through the Proposed Action or alternatives. The NEED is the underlying problem or opportunity.

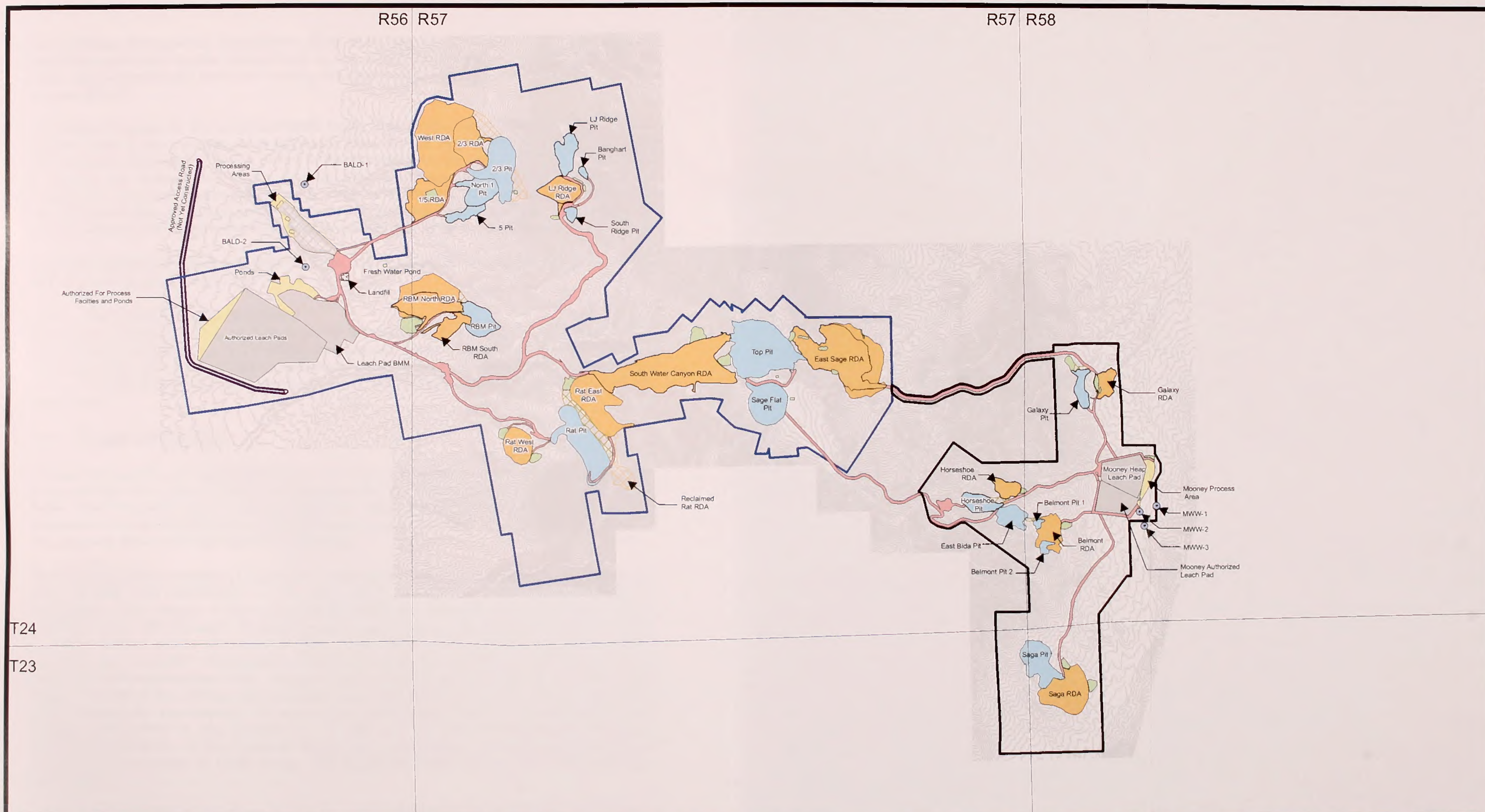
1.3.2 BLM's Purpose and Need

The BLM is responsible for authorizing mineral rights access on certain federal lands as authorized by the General Mining Law of 1872 as amended. The BLM also has the responsibility to protect surface resources of BLM-administered lands to the extent practicable.



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 1-1
GENERAL LOCATION



Legend

- Existing BMM POO Boundary
- Existing Mooney POO Boundary
- Authorized/Existing Monitoring Well
- Authorized/Existing Haul Road
- Authorized/Existing Leach Pad
- Authorized/Existing RDA
- Authorized/Existing Pit
- Authorized/Existing Growth Media Stockpile
- Approved Access Road
- Reclaimed RDA
- Process Facilities and Ponds
- Interpit Area
- Landfill
- Reclaimed Leach Pad

N

0 2,500 5,000 7,500

Feet

1:60,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 1-2
EXISTING AND PREVIOUSLY AUTHORIZED BMM AND MOONEY BASIN OPERATIONS AREA FACILITIES

BLM Surface Management Regulations state that "Anyone intending to develop mineral resources [authorized by the mining laws] on the public lands must prevent unnecessary or undue degradation of the land and reclaim disturbed areas" (43 Code of Federal Regulations Subpart 3809.1).

The BLM's Purpose for the proposed BMM North Operations Area Project is to authorize a legitimate use of the public lands which would allow Barrick to continue to profitably recover gold resources from federal mining claims in the Proposed Action area. The BLM would strive to balance the financial and social benefits from this Proposed Action while preventing unnecessary or undue degradation of public lands and ensuring future post-mining land use. The BLM would then meet its mission statement to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

The BLM's Need is to respond to Barrick's Plan of Operations in compliance with the 43 CFR 3809 regulations and other statutes.

1.3.3 Barrick's Purpose and Need

The purpose of Barrick's Plan of Operations for the BMM North Operations Area Project is to expand mining opportunities at the BMM and Mooney Basin Operation, while consolidating these two mines into one new Plan of Operations called North Operations Area. The need is to continue to profitably recover gold resources from federal mining claims within the Proposed Action area.

1.4 Proposed Action

To meet the purpose and need, Barrick has submitted a proposal to the BLM Egan Field Office to expand and consolidate the Plans of Operations for the BMM and Mooney Basin Operations Areas. The Proposed Action would consolidate the existing BMM (N-68193) and Mooney Basin Operations Area (N-78822) Plans of Operations into one unified Plan of Operations identified as the proposed BMM North Operations Area Project.

The Proposed Action consists of expanding existing open pits, rock disposal areas, and heap leach facilities and constructing a new truck shop, as well as continuing the operation, reclamation, and closure of the consolidated BMM and Mooney Basin Operations Area (including mine offices, truck shops/warehouse, haul roads, ore stockpiles, access roads, diversion ditches, power transmission lines, water wells and pipelines, process solution pipelines, and a landfill). The proposed expansion would be primarily on unpatented mining claims on BLM-administered land. Project access would continue to be via existing public roads. The life of the existing mine operation (currently estimated to end in mid to late 2009) would increase by approximately 10 years under the Proposed Action. The Proposed Action includes 3,920 acres of new disturbance. A total of 4,165 acres of disturbance has been previously authorized. If the Proposed Action was implemented, the authorized disturbance footprint would increase to 8,085 acres. The Proposed Action also includes reclamation of disturbance.

Combining the Mooney Basin Operations Area and the BMM into one project area would result in the new BMM North Operations Area Project Plan of Operations boundary being expanded to include an additional 3,738 acres of public land. The original operational boundaries of the two mines encompassed 12,727 acres of public and private land. The Proposed Action area boundary for the BMM North Operations Area Project would encompass a total of 16,465 acres of public and private land, although only 8,085 acres within this boundary would be disturbed. The new proposed consolidated Plan of Operations boundary is shown on Figure 1-3.

Nearly all of the proposed mining activities are located on public land and are therefore subject to review and approval by the BLM pursuant to the Federal Land Policy and Management Act of 1976, as amended, and corresponding surface management regulations (43 Code of Federal Regulations Subpart 3809). These activities and their approval by the BLM pursuant to the Federal Land Policy and Management Act constitute a federal action and are thus subject to NEPA. The BLM has determined that the Proposed Action constitutes a major federal action and that an EIS must be prepared to fulfill the requirements of NEPA.

The Proposed Action is discussed in further detail in Chapter 2.

1.5 Existing Analysis Documents Used for This Statement

This FEIS incorporates by reference the following existing environmental analyses:

Bureau of Land Management (BLM). 1995. *Bald Mountain Mine Expansion Project Final Environmental Impact Statement*. U.S. Department of the Interior, Bureau of Land Management, September 1995.

______. 2003. *Mooney Basin Expansion Project Environmental Assessment* (NV040-03-032), December 2003.

______. 2004. *Bald Mountain Mine Exploration Program Programmatic Environmental Assessment* (NV040-04-023), October 2004.

______. 2005. *Bald Mountain Mine 2005 Expansion Environmental Assessment* (NV040-006-005), November 2005.

_______. 2006. *Placer Dome U.S., Inc. Bald Mountain Mine, Little Bald Mountain Mine, Underground Mining and Haul Road Environmental Assessment* (NV040-06-035), September 2006.

These documents are included in the Administrative Record and are available for review at the BLM Egan Field Office.

1.6 Relationship to Agency and Other Policies and Plans

The BLM is responsible for administering mineral rights access on certain federal lands as authorized by the General Mining Law of 1872. Under the law, qualified prospectors are entitled to reasonable access to mineral deposits on public domain lands that have not been withdrawn from mineral entry.

The BLM Ely District has the responsibility and authority to manage the surface and subsurface resources on public lands located within the Ely District. Barrick's use of public land in the Ely District requires compliance with BLM's Surface Management Regulations (43 Code of Federal Regulations 3809) and other applicable statutes, including the Mining and Mineral Policy Act of 1970 (as amended) and Federal Land Policy and Management Act of 1976 (as amended). The BLM must review Barrick's plan for mining and development to ensure the following:

- Adequate provisions are included to prevent unnecessary or undue degradation of federal lands and to protect the non-mineral resources of the federal lands;

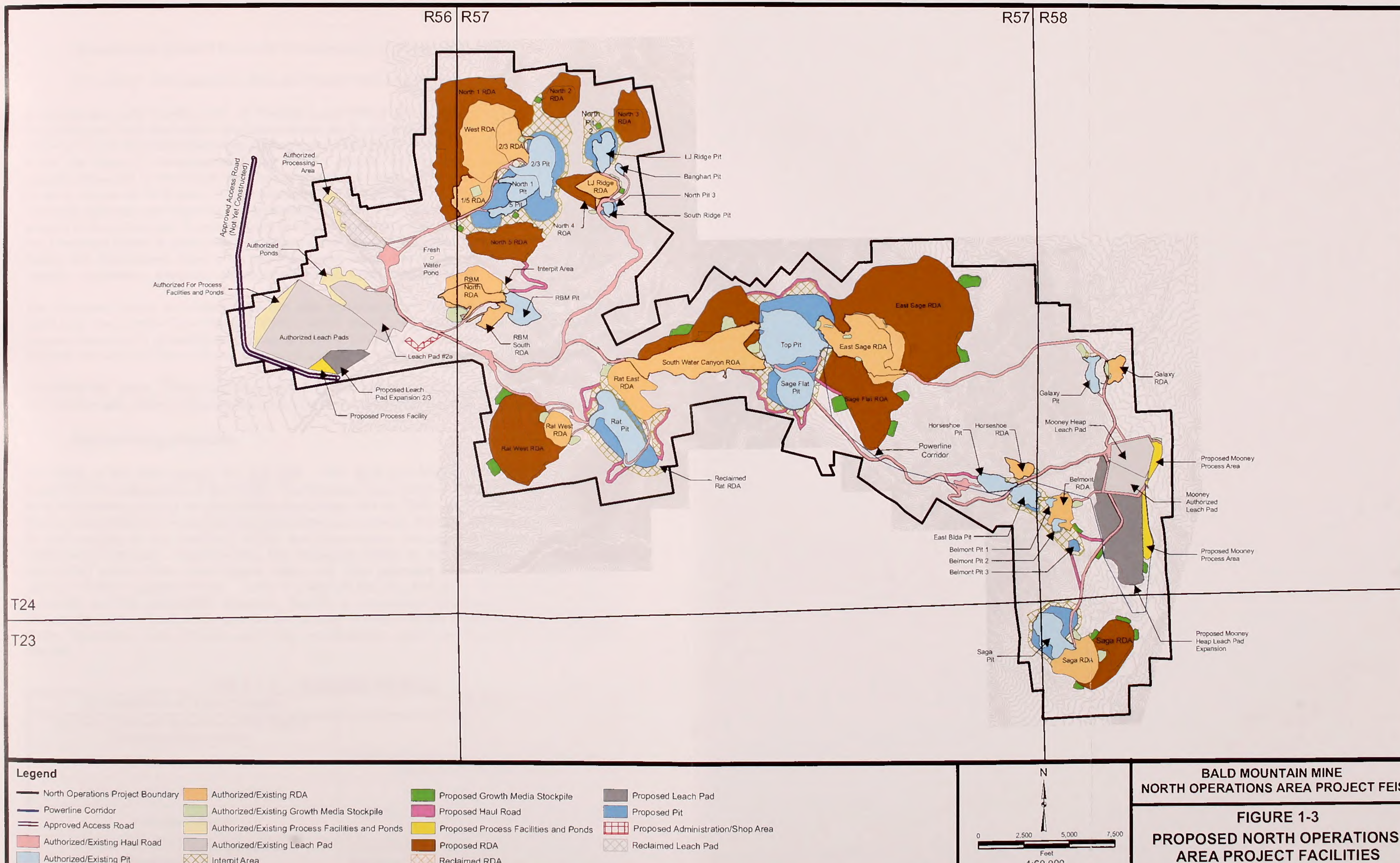


FIGURE 1-3
PROPOSED NORTH OPERATIONS AREA PROJECT FACILITIES

- Measures are included to provide for reclamation of disturbed areas; and
- Compliance with applicable state and federal laws is achieved.

In accordance with Section 202 of Federal Land Policy and Management Act of 1976 (as amended), the Proposed Action and alternatives are in conformance with the Ely District Record of Decision and Approved Resource Management Plan (BLM, 2008). The objective for minerals in the Ely Resource Management Plan is, "To provide for the responsible development of mineral resources to meet local, regional, and national needs, while providing for the protection of other resources and uses." The Management Action for locatable minerals is to, "Allow locatable minerals development on approximately 9.9 million acres of Federal mineral estate, subject to the prevention of unnecessary or undue degradation of public lands." The location of the Proposed Action is within the 9.9 million acres open to locatable minerals. The Proposed Action and alternatives have also been analyzed within the scope of other relevant plans, statutes, regulations, executive orders, and manuals listed in Appendix A.

The Proposed Action and alternatives are also consistent with the *White Pine County Public Land Use Plan* (White Pine County, 1998b), which specifically recognizes that development of mineral resources is desirable and necessary to the State and the nation. The Plan also states that it is the policy of White Pine County to encourage mineral exploration and development.

The BMM EIS (BLM, 1995a) and the supporting cumulative impacts analysis in Appendix B of the EIS were also used to the extent practicable in the preparation of this document.

1.7 Authorizing Actions

The BLM is the lead agency for this EIS. The BLM Ely District Manager is the official responsible for preparation of this FEIS. The Nevada Department of Wildlife (NDOW) is serving as a cooperating agency for preparation and review of this FEIS. NDOW is the State agency directly responsible for managing fish and wildlife resources in Nevada. The BLM is responsible for the analysis of the Proposed Action and alternatives, document preparation, and public review and comment. Implementing the Proposed Action or the alternatives would require authorizing actions from other federal, state, and local agencies with jurisdiction over certain aspects of the Proposed Action. Table 1-2 lists all the required state and federal permits or approvals and the responsible agencies. Barrick is responsible for applying for and acquiring the permits listed. Most of the permits are already in place for the existing BMM and Mooney Basin Operations Area projects, and only modifications would be required for the existing permits.

TABLE 1-2 REQUIRED PERMITS

AUTHORIZING ACTION / PERMIT	AGENCY
43 Code of Federal Regulations 3809 Plan of Operations Authorization	BLM
Air Quality Operating Permit	Nevada Division of Environmental Protection, Bureau of Air Pollution Control
Hazardous Materials Storage Permit	Nevada State Fire Marshal
Explosives Permit	U.S. Department of the Treasury, Bureau of Alcohol, Tobacco, and Firearms
Water Pollution Control Permit and Reclamation Permit	Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation

AUTHORIZING ACTION / PERMIT	AGENCY
General Permit for Storm Water Discharges Associated with Industrial Activity from Metals Mining	Nevada Division of Environmental Protection, Bureau of Water Pollution Control
General Permit to Operate Septic Systems	Nevada Division of Environmental Protection, Bureau of Water Pollution Control
Jurisdictional Delineation Report Concurrence	U.S. Army Corps of Engineers
Permit to Appropriate Water	Nevada Division of Water Resources
Solid Waste Class III Wavered Landfill Authorization	Nevada Division of Environmental Protection, Bureau of Waste Management
EPA ID Number (RCRA)	U.S. Environmental Protection Agency
County Special Use Permit	White Pine County
Hazardous Materials Transportation Permit	Nevada Department of Transportation.
Public Water System Permit	Nevada Division of Environmental Protection, Bureau of Safe Drinking Water
Industrial Artificial Pond Permit	Nevada Department of Wildlife

1.8 Summary of Public Scoping Process

A Notice of Intent to prepare an EIS for the BMM North Operations Area Project was published in the Federal Register on March 30, 2007. The Notice of Intent announced scoping meetings to be held in the neighboring communities of Ely, Elko, and Eureka, Nevada, and invited scoping comments to be submitted to the BLM. The duration of the public scoping period was 56 days, closing on May 25, 2007 (Appendix B).

The original project mailing list (Appendix B) for this was generated by the BLM Egan Field Office in March 2007, and represented individuals, agencies, or organizations who had expressed interest in similar projects. A scoping letter was prepared and sent to all parties on the mailing list. This letter provided an overview of the Proposed Action; identification of preliminary issues; the times, dates, and locations of public scoping meetings; a request for written comments; directions on how to submit scoping comments; and identification of BLM contacts (Appendix B).

A legal notice of the Proposed Action was prepared by the BLM and published in the *Elko Daily Free Press* and *Ely Daily Times* and distributed to public posting locations in Ely, Elko, and Eureka. A news release was also distributed to the local media. The legal notice and each news release informed the public of BLM's intention to prepare the BMM North Operations Area Project EIS, a description of the Proposed Action, the dates and times of the three scoping meetings, and methods for providing comments (Appendix B).

Scoping meetings were held in Elko, Ely, and Eureka, Nevada, on May 7, 8, and 9, 2007, respectively. The meetings were informal and held in an open-house format where information on the NEPA process and project specifics was displayed with posters, handouts, and presentations. Representatives of BLM, NDOW, and Barrick attended the meetings. Public attendees at the meetings were asked to sign a register and invited to provide scoping comments. These were made part of the administrative record, which is available at the BLM Egan Field Office.

1.9 Issues

Issues were raised both internally (see Chapter 2 for discussion of internally generated issues) and externally. All comments received during public scoping were recorded. Issues and concerns that were raised included potential impacts on Ruby Valley and the Ruby Lake National Wildlife Refuge, located approximately seven air miles north of the Proposed Action area. Additional comments included concerns about increased traffic, increased vehicle speed, increased water use, loss of wildlife habitat (mule deer winter range in particular), air quality, land use access, visual aesthetics, potential economic impacts, and mercury deposition. Table 1-3 provides a list of the individuals who provided comments during the public scoping period for the Proposed Action including these comments and concerns. Although these were considered during the NEPA process, not all concerns warrant analysis in the EIS. Key issues of analysis that came from the internal and external scoping process are the potential changes to groundwater quality and quantity, change in water discharge and recharge that may affects seeps and springs, loss of cultural resources, the potential for increased mercury and particulate pollutants in the air, the potential for spread of non-native invasive species, the potential effect on pygmy rabbit and sage grouse habitat, the reduction of transitional wildlife habitat, specifically mule deer, and the potential for mine activities and structures to adversely affect migratory deer movement. These and other issues for analysis are summarized in the Summary under each resource.

TABLE 1-3 PUBLIC COMMENT INFORMATION

NAME	ORGANIZATION	COMMENT
Martha Collins	Refuge Manager, Ruby Lake National Wildlife Refuge	- Increased traffic through Ruby Valley and refuge. Safety concern. - Hearing rumors of paving Ruby Valley Road (not in favor). - Increased use of water. Concern with pumping and effect on refuge habitat.
Tom Bath	Bath Lumber Co.	Meetings were very informative. Fully supports project.
George Fennemore	Barrick Gold Corporation Cortez Gold Mines	Please consider the socioeconomic value of high wage mining jobs for the workforces in Elko, Spring Creek, Ely, Eureka, and other communities in northeast Nevada.
Don Harris	Midway Gold Corp.	- Bald Mtn has been an excellent neighbor especially w/blading main road between Jiggs and Mine. - Concern over wildlife habitat loss, especially mule deer which use the south Rubies as winter range. - Fugitive Dust - Increased water use with expansion in a dry area.
Anonymous		- Main concern with more vehicles on road and speed they travel. Sees traffic speeding on road. - Worried about the environment, wildlife, air quality, aesthetics, land use access.
Anonymous		- Increased dust particulates. - Potential mercury deposition (effects on refuge wildlife). - Generally, please thoroughly discuss impact of expanded operations on the refuge. - Does increased area mean increased mining activity?

NAME	ORGANIZATION	COMMENT
Jeanne Geselbracht	Environmental Protection Agency	Environmental Protection Agency's recommendations for inclusion in this EIS. - Purpose and Need Statement - Alternatives Analysis - Water Resources - Air Quality - Hazardous Air Pollutants - Vegetation and Wildlife - Mining Waste Management and Land Reclamation - Environmental Justice - Government to Government Consultation - Land Use - Pollution Prevention - Cumulative Impacts
Gosia Sylwestrzak	Nevada State Clearinghouse	- Indicating the Division of Water Resources supports the proposal as written.

1.10 Summary of DEIS Public Comment Period

The BMM North Operations Area Project Draft Environmental Impact Statement (DEIS) was made available for public comment on December 19, 2009. The public comment period lasted 45 days from December 19, 2009 until February 2, 2009. Three public comment meetings were held during the public comment period. These meetings were held in Ely, Nevada on January 6, 2009; Elko, Nevada on January 7, 2009; and in Eureka, Nevada on January 8, 2009. Project information was presented in an open-house format at these meetings with BLM and Barrick representatives present to discuss concerns and answer questions.

Individuals, public agencies, and non-profit organizations submitted 17 letters containing comments on the DEIS. The comments received and responses to these comments are contained in Appendix C. Additional information about public scoping is presented in Chapter 5 Consultation and Coordination.

Chapter 2
Existing Operations, Proposed Action, and Alternatives

2.1 Introduction

This chapter describes and compares the Proposed Action, two action alternatives, and the No Action Alternative, as required by 40 Code of Federal Regulations 1502.15 (d). Alternatives are in comparative form to inform the public and other agencies and to provide a basis for a decision by the responsible official (40 CFR 1502.14). For a complete discussion of the effects used to compare alternatives, consult Chapter 3, "Affected Environment and Environmental Consequences."

Each component or area of expansion is described in sufficient detail to facilitate understanding of the Proposed Action and alternatives. Figures that clearly show the current operations and proposed expansion of the facilities are included.

In addition to the Proposed Action, three alternatives are analyzed in the FEIS. The two action alternatives are based upon issues identified by the BLM, Barrick, and public comments received during the public scoping process. These alternatives are intended to reduce or minimize potential impacts associated with the Proposed Action and be responsive to the key issues. Descriptions of additional alternatives that were initially considered are provided, as well as the rationale for why they were eliminated from detailed analysis. A No Action alternative is also analyzed.

A description of existing operations at the BMM and Mooney Basin Operations Area is provided to facilitate a better understanding of the Proposed Action, as the Proposed Action is primarily an expansion of existing facilities including pits, waste dumps, and processing components. This chapter is organized to provide a description of the existing operations first, followed by a description of the Proposed Action, and, finally, a description of the alternatives, including those carried forward in the analysis and those that were eliminated from detailed analysis.

2.2 Existing Operations

This section describes the existing and authorized mining, processing, and exploration operations in the BMM and Mooney Basin Operations Area Plans of Operations. Section 2.2.1 describes the BMM, and Section 2.2.2 describes the Mooney Basin Operations Area. Existing and authorized disturbance totals are shown in Table 2-1. The content of this section is presented only as background information. Existing and previously authorized disturbance is not part of the Proposed Action, nor is it being analyzed in this FEIS.

TABLE 2-1 SURFACE DISTURBANCE SUMMARY

MINE	AUTHORIZED[1] (ACRES)	EXISTING[2] (ACRES)
Bald Mountain[3]	3,418	3,058
Mooney Basin[4]	747	510
Total	**4,165**	**3,568**

Sources: Enviroscientists, 2006; BLM, 2005b; BLM, 2005c; BLM, 1995a; BMM, 2009.
[1] Includes authorized exploration.
[2] Includes exploration and reclaimed acres that have not yet been released from bond requirements.
[3] Authorized acres per 2006 BMM North Area Amendment to Plan and Three-Year Reclamation Bond Update. Existing acres are bonded acres from the 2006 BMM North Area Amendment to Plan and Three-Year Reclamation Bond Update.
[4] Disturbance at Saga and Belmont facilities has been authorized, but facilities have not been fully constructed. 2005 proposed acres not included in existing disturbance.

2.2.1 Bald Mountain Mine

The existing BMM facilities include open pits, rock disposal areas, roads, an administrative/shop complex, and process facilities including heap leach pads, ponds, and associated buildings. The BLM has authorized approximately 3,418 acres of disturbance associated with these facilities (Table 2-2). Although authorized, the mill and tailings facilities have not been constructed. The current BMM operation, as shown on Figure 1-2, consists of four general areas: the Process Area, the North Area Complex, the Top/Sage Area, and the Rat/RBM Area. The existing and approved activities associated with these areas, as well as exploration activities, are described in this section.

TABLE 2-2 BALD MOUNTAIN MINE AUTHORIZED DISTURBANCE

PROJECT COMPONENT	AUTHORIZED DISTURBANCE IN MAY 2006 (ACRES)
Pits and Related Disturbance	
North Pit 1 (1, 2, 3, and 5)	159
North Pit 2 (LJ Ridge)	52
RBM	55
Rat	116
Top/Sage Complex (Top and Sage Flats Combined)	263
Top Underground	0
Subtotal	**645**
Ore and Process Facilities	
Pad #1	65
2/3 Pad	229
BMM Process	114
Tailings & Leach Pad Expansion[1]	333
Subtotal	**741**
Rock Disposal Areas	
North 1 (One, Two, Three, Five, West Combined)	343
North 4 (Formerly LJ Ridge)	51
Rat East[2]	133
Rat West	51
RBM North	133
RBM South	30
East Sage	250
South Water Canyon (formerly Top)	263
Subtotal	**1,310**

PROJECT COMPONENT		AUTHORIZED DISTURBANCE IN MAY 2006 (ACRES)
Support Facilities		
	Soil Stockpiles	47
	Ancillary Facilities/Roads	50
	Haul Roads	233
	Interpit Areas	47
	Subtotal	**408**
Total Mine and Process Area Disturbance		**3,104**
Other Areas of the Project		
	Exploration	314
	Subtotal	**314**
Total BMM Area Disturbance		**3,418**

Source: BMM, 2009.

[1] Acres removed from 1995 tailings expansion authorization and placed into proposed 2/3 Pad Expansion (BLM, 1995a).

[2] Pit Expansion removes 15.6 acres of reclaimed rock disposal area.

Process Area

The existing process area at BMM consists of two heap leach facilities, process ponds, process and administrative buildings, utilities, and support facilities. The existing and authorized disturbance for the process area is shown on Figures 1-2, 2-1, and 2-2. Heap Leach Pad No.1 has been closed and reclaimed and is currently under post-closure monitoring. Leaching activities are ongoing at the 2/3 Heap Leach Pad. In addition, the BMM EIS (BLM, 1995a) analyzed a new ore process facility within the Plan of Operations boundary on the east side of the 2/3 Heap Leach Pad. The facility included milling facilities, an expanded heap leach pad, a tailings impoundment, haulage and access corridors, and other support facility disturbance. The milling facilities, expanded heap leach pad, and tailings impoundment have not been constructed.

North Area Complex

The existing and authorized facilities in the North Area Complex include the West Rock Disposal Area, 1/5 Rock Disposal Area, LJ Ridge Rock Disposal Area, six open pit areas, an interpit area (i.e., the area around pits and dumps with intermittent disturbance for access roads, safety berms, etc.), haul roads, exploration roads, secondary roads, and growth medium stockpiles. These facilities are shown on Figure 2-3. In May 2006, the BLM authorized expansion of the North 2/3 Pit to the east and west. The BLM also authorized expansion and combining of the North 1 Rock Disposal Area and the 2/3 Rock Disposal Area to form the West Rock Disposal Area, and development of interpit road areas at the North A Pit (BLM, 2005b). The North Area Complex is not currently being mined although exploration activity continues in this area. The LJ Ridge area is located east of Heap Leach Pad No. 2/3 (Figure 1-3) and consists of the LJ Ridge Pit, South Ridge Pit, Banghart Pit, LJ Ridge Rock Disposal Area, and a haul road. The LJ Ridge area is currently inactive.

Top/Sage Flat Area

The Top/Sage Flat Area includes the Top Pit, Sage Flat Pit, South Water Canyon Rock Disposal Area, East Sage Rock Disposal Area, and various haul roads and exploration disturbance. Existing and authorized activities are shown on Figure 2-4. The Top Pit and South Water Canyon Rock Disposal Area were approved as described in the BMM EIS (BLM, 1995a). The East Sage Rock Disposal Area has been authorized as described in the approval of the Amendment to the BMM Plan of Operations (BLM, 2005b). All waste rock has been placed in the South Water Canyon Rock Disposal Area. Associated haul roads are included in the Top/Sage Flat Area disturbance.

The Top Underground project has been authorized through approval of an Environmental Assessment (BLM, 2006c). To date, no underground mining activities have been initiated.

Rat/RBM Area
The Rat/RBM Area consists of an open pit, interpit areas, rock disposal areas, and haul roads as authorized by the BLM (BLM, 1992a). Existing and authorized disturbance is shown on Figure 2-5. The rock disposal areas are located east and west of the pits. The Rat Pit haul road intersects the Top Pit haul road in order to access support and process facilities.

Expansion of the Rat Pit to the north, south, east, and west, as well as at depth, has been previously authorized, as well as moving a portion of the reclaimed Rat East Rock Disposal Area to the east to accommodate the pit expansion. The reclaimed area shown on Figure 2-5 has not been released from bonding requirements. Currently, Barrick is conducting activities under the 2005 authorization.

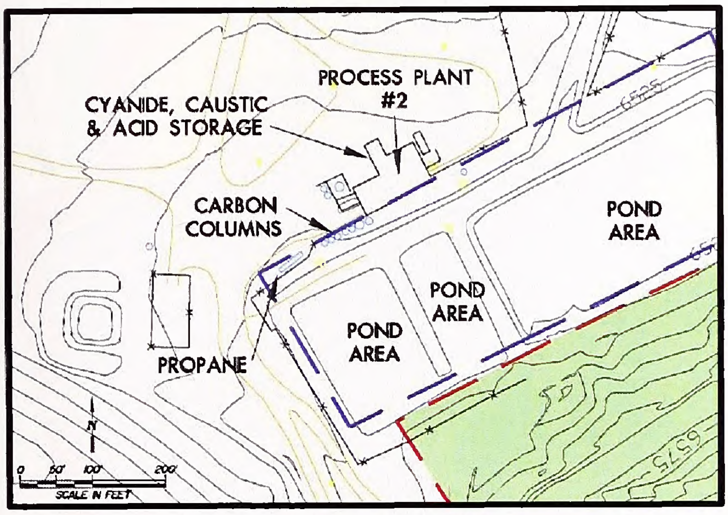
The RBM Area is located northeast of the office complex and is also currently active. The RBM Area consists of a pit, two rock disposal areas, a haul road, and exploration disturbance. The current RBM Pit and the RBM North Rock Disposal Area were previously authorized by the BLM (BLM, 1992a). The rock disposal area has been authorized to disturb 68 acres of previously reclaimed area, which has not been released from bonding requirements. Interpit disturbance areas have been authorized between the RBM Pit and associated rock disposal areas (BLM, 2005b).

Exploration Areas
Exploration areas are widely distributed throughout the existing Plan of Operations boundary, with highest densities proximal to proposed or active pits. Barrick maintains an ongoing effort to reclaim inactive exploration roads and sites within the Plan of Operations boundary. Up to 314 acres of exploration disturbance are authorized within the BMM Plan of Operations (BLM, 1995a).

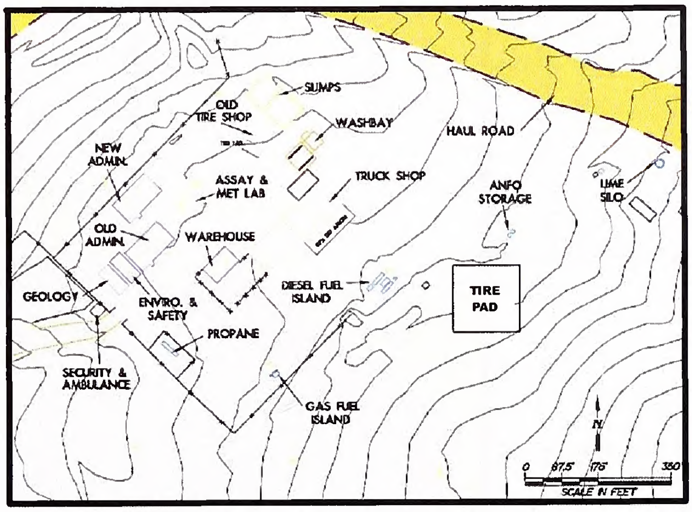
Roads
As previously authorized the Elko public access road would be re-routed to follow the western boundary of the existing BMM process and ancillary disturbance area shown in Figure 1-3. The current running width of 25 feet would be maintained with an average proposed disturbance width of 50 feet. The additional disturbance width would be used for berms, stormwater diversion ditches, and road cuts, where required by existing topography.

2.2.2 Mooney Basin Operations Area
As shown on Figure 1-2, the Mooney Basin Operations Area is located approximately two miles east of the current BMM Plan of Operations boundary. The BLM has authorized approximately 747 acres of disturbance associated with pits, rock disposal areas, heap leach and recovery facilities, roads, growth medium stockpiles, utilities, and support facility disturbance (Table 2-3). Existing and authorized facilities are shown in Figure 2-6. Operational pit areas include the Bida and Belmont pits, Galaxy Pit, Horseshoe Pit, and Saga Pit. Barrick has previously mined from the Galaxy and Horseshoe pits, and mining is currently active in both the Bida and Belmont pits and the Saga Pit. Waste rock is stored in the Horseshoe, Saga, Bida, and Galaxy rock disposal areas, and ore is hauled to the Mooney Basin Heap Leach Pad from these pits. Partial backfill of the Horseshoe Pit has also been completed.

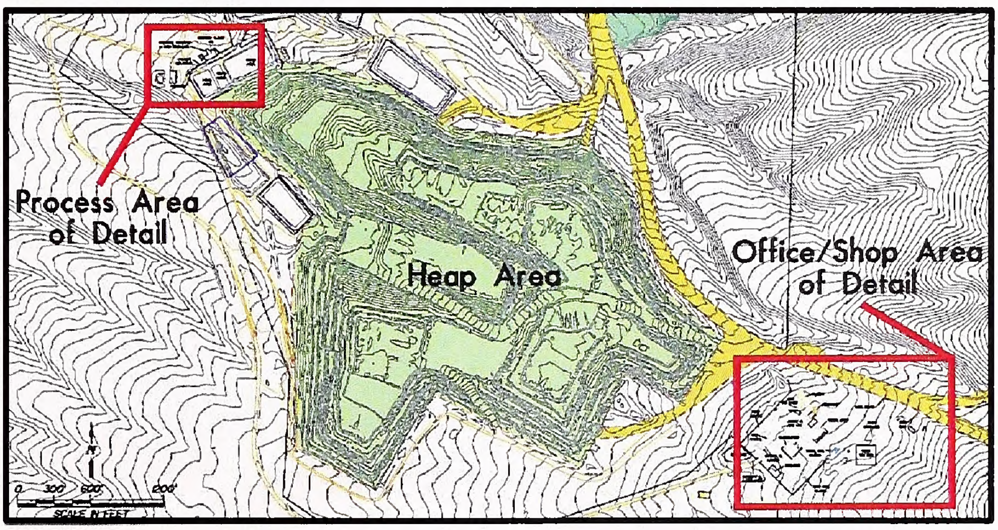
In 2005, the existing Mooney Basin Heap Leach Pad was approved for a 56.2-acre expansion to the south of the existing facility. A new haul road from the Galaxy Pit to the Top Pit (BLM, 2003a) and a leach pad expansion that covered part of the Horseshoe and Saga haul roads



Process Area Detail



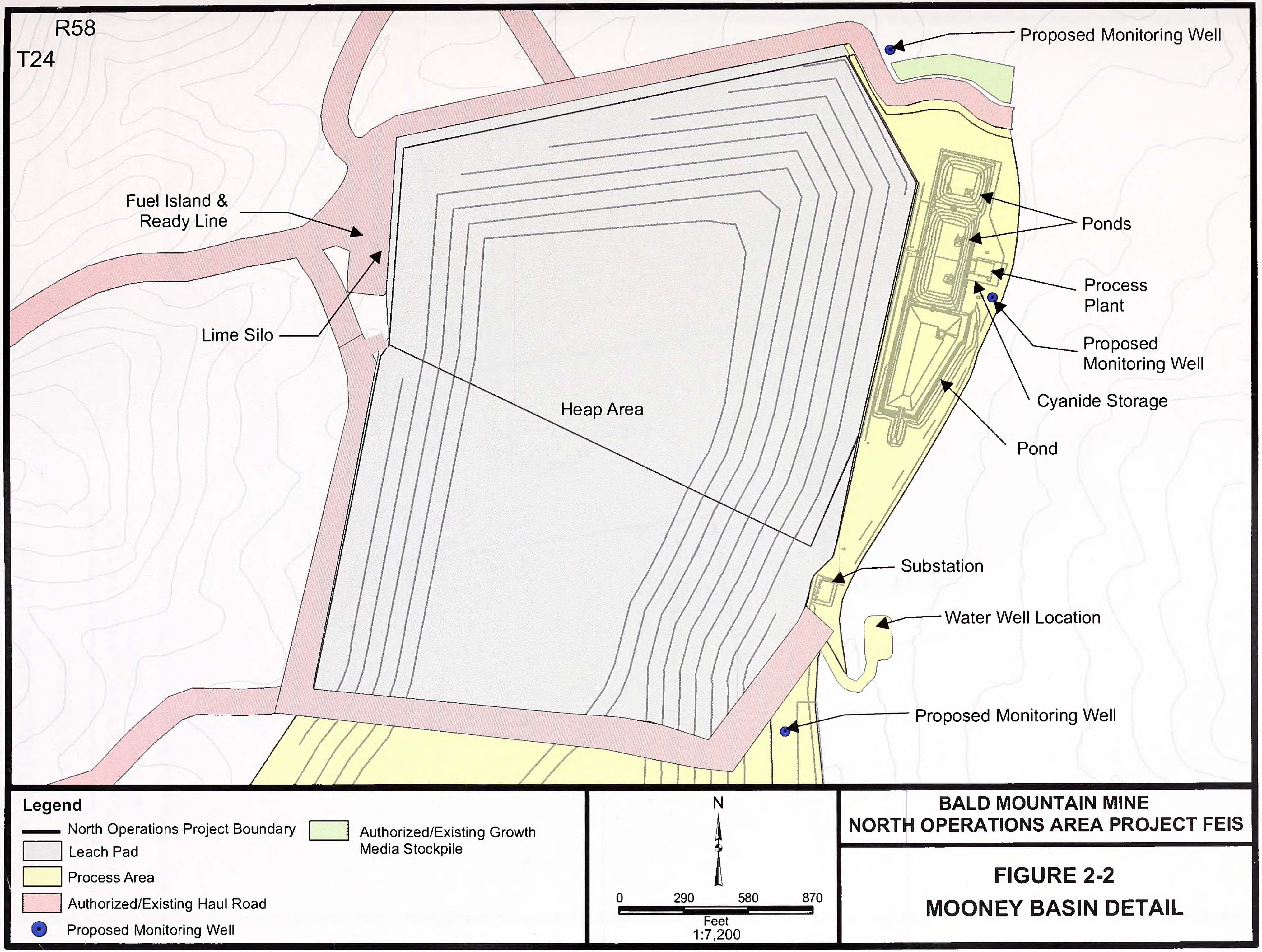
Office/Shop Area Detail



Bald Mountain Mine General Site Location Map

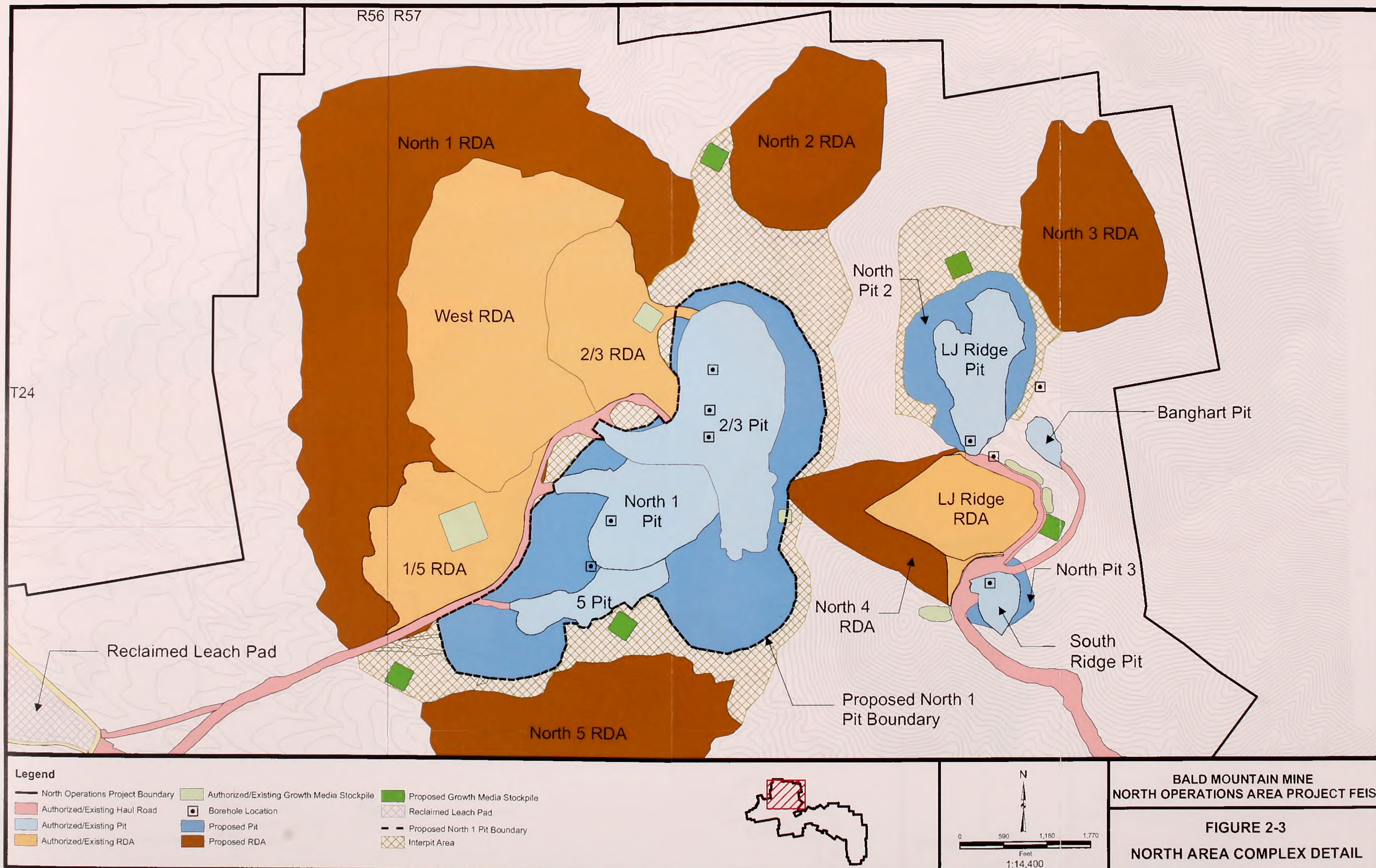
BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-1
BMM PROCESS AND
ADMINISTRATION AREA DETAIL



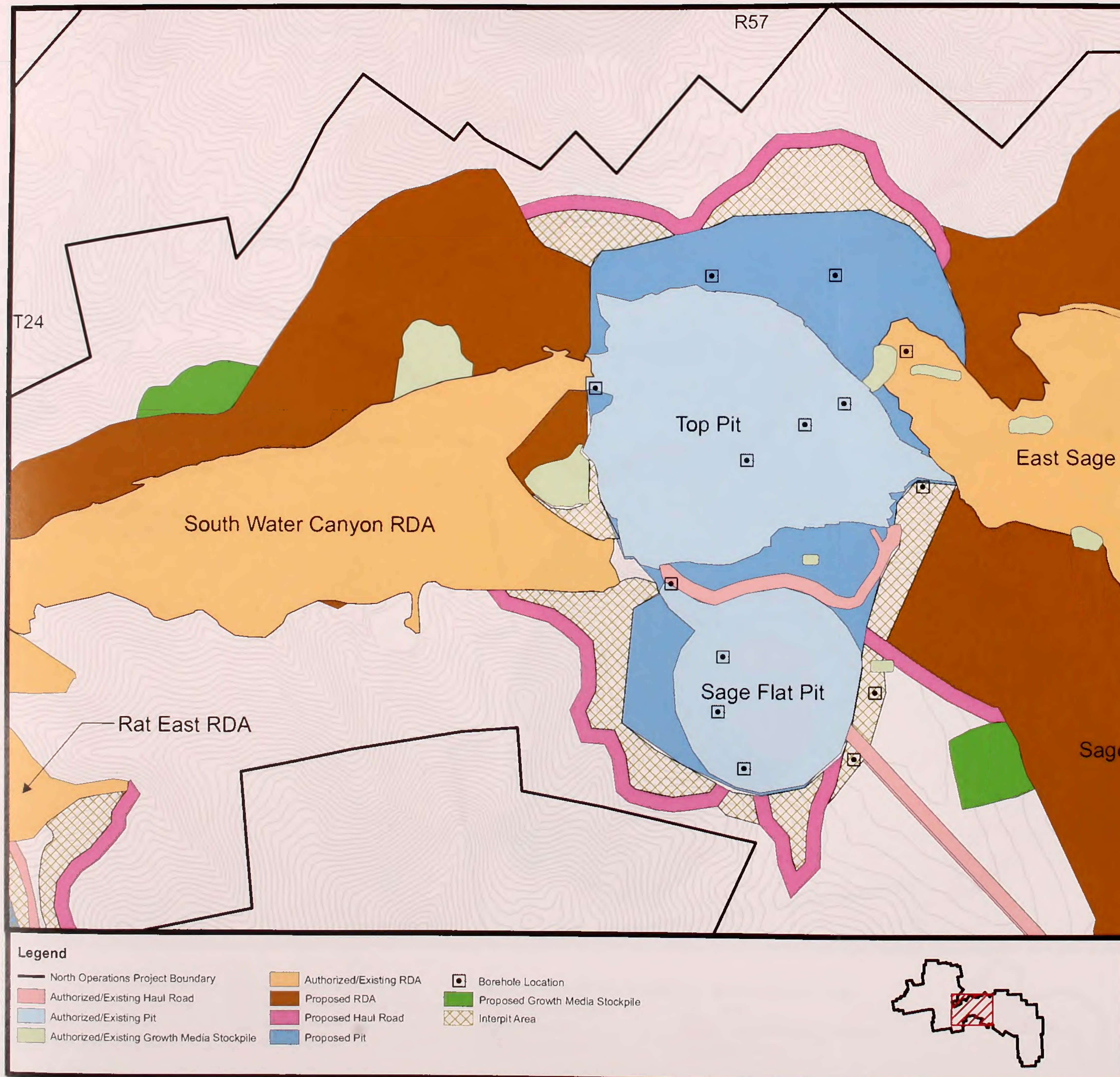
BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-2
MOONEY BASIN DETAIL



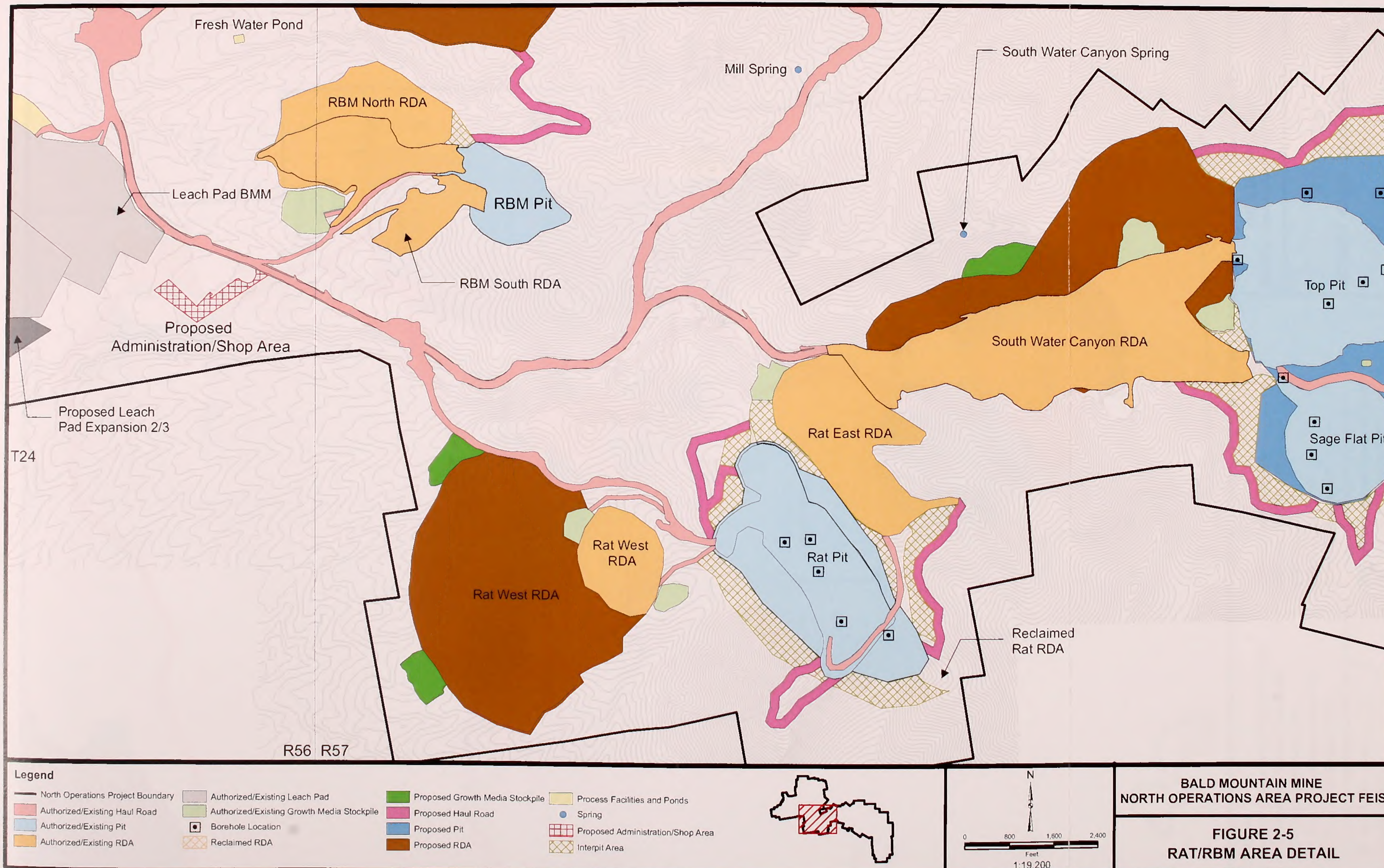
BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-3
NORTH AREA COMPLEX DETAIL



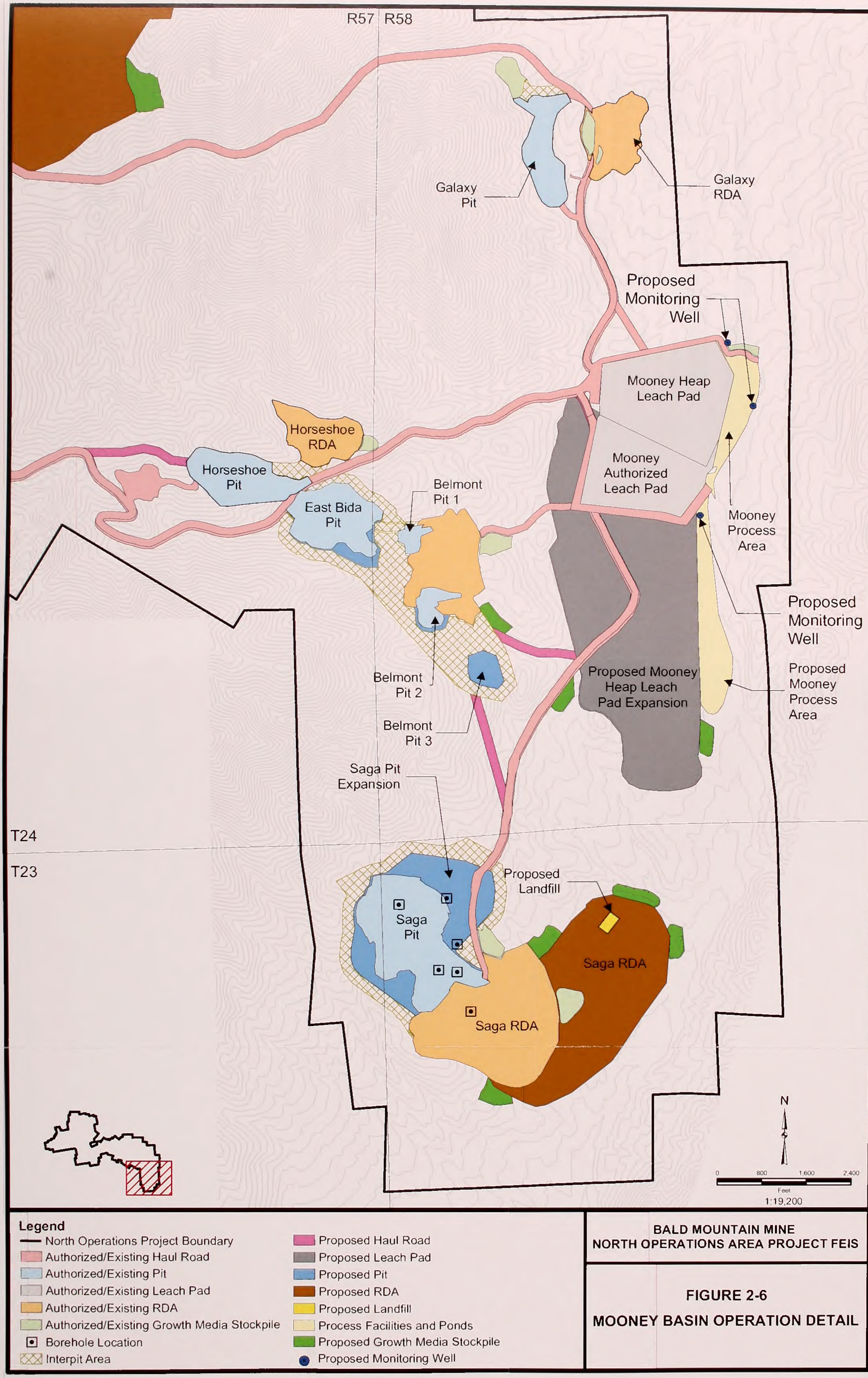
BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-4
TOP/SAGE FLAT AREA DETAIL



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-5
RAT/RBM AREA DETAIL



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-6

MOONEY BASIN OPERATION DETAIL

were also approved and constructed. Other changes to the heap leach facilities included adding a stormwater diversion ditch and a stormwater/freshwater pond.

Exploration activities are also ongoing within the existing Mooney Basin Operations Area Plan of Operations boundary.

TABLE 2-3 MOONEY BASIN AUTHORIZED DISTURBANCE

PROJECT COMPONENT		AUTHORIZED DISTURBANCE IN 2005 (ACRES)
Pits and Related Disturbance		
	Horseshoe	33.0
	East Bida	34.8
	Galaxy and Galaxy II	31.2
	Saga	70.0
	Belmont (1, 2, 3)	11.6
	Subtotal	**180.6**
Ore and Process Facilities		
	Pad	137.2
	Process	11.8
	Subtotal	**149.0**
Rock Disposal Facilities		
	Horseshoe	24.9
	Galaxy	29.9
	Saga	98.5
	Belmont[1]	42.7
	Subtotal	**196.0**
Support Facilities		
	Soil Stockpiles	15.5
	Interpit Areas	0
	Existing Ancillary Facilities	28.6
	Water Well #3	1.1
	Leach Pad Diversion Ditch	1.4
	Galaxy Pit Shortcut	2.8
	All Haul Roads	121.8
	Secondary Roads/Pit Ramps/ Floors[2]	11.2
	Landfill	0
	Power Line to Top/Sage Complex[3]	0
	Borrow Pits[4]	5.7
	Subtotal	**188.1**
Total Mine and Process Area Disturbance		**713.7**
Other Areas of the Project		
	Exploration	33.6
	Subtotal	**33.6**
Total Mooney Basin Area Disturbance		**747.3**

Source: BMM, 2009.

[1] The Belmont Pit 2 expansion removes 3.7 acres of previously authorized rock disturbance area.

[2] Secondary roads category was moved to the Interpit Areas category.

[3] Total power line length is 34,157 feet, of which 9,035 feet is on previously authorized disturbance. Disturbance width is 25 feet.

[4] Borrow pits and landfills were removed by the Mooney Basin Heap Leach Pad Expansion.

2.3 Proposed Action

The Proposed Action would unify the BMM and Mooney Basin Plans of Operations into one Plan of Operations entitled *Bald Mountain Mine - North Operations Area*. Barrick proposes to expand the existing gold mining and recovery operations, as well as develop new gold mining and recovery operations and continue exploration within a unified BMM North Operations Area Project Plan of Operations boundary, hereafter referred to as the Proposed Action area. The Proposed Action area encompasses 16,465 acres, of which 8,085 acres would be disturbed. The proposed disturbance is shown on Figure 2-7. The BLM has previously authorized the disturbance of 3,418 acres within the BMM Plan of Operations boundary and 747 acres within the Mooney Basin Operations Area boundary for a total of approximately 4,165 acres, also shown on Figure 2-7. As stated earlier in this chapter, the proposed disturbance is associated with pits, rock disposal areas, heap leach and recovery facilities, roads, growth medium stockpiles, and exploration (Table 2-4). Table 2-4 provides the authorized disturbance acreage for each facility and the Proposed Action disturbance acreage with the expansion of the facilities and development of the new facilities. This FEIS analyzes only the effects of the Proposed Action and does not address previously authorized actions (the existing BMM and Mooney Basin operations).

TABLE 2-4 SUMMARY OF PROPOSED DISTURBANCE WITHIN THE PLAN OF OPERATIONS BOUNDARY

COMPONENT	AUTHORIZED DISTURBANCE (ACRES)	PROPOSED ACTION DISTURBANCE (ACRES)	TOTAL DISTURBANCE (ACRES)[1]
Open Pits			
North Pit 1 (combines existing North 1, 2/3, and 5 pits)	159	171.5	330.5
North Pit 2 (existing LJ Ridge)	52	21.4	73.4
North Pit 3 (existing South Ridge)	--	20.8	20.8
RBM	55	--	65
Rat	116	76.8	192.8
Top/Sage Flat Pit Complex	263	173	436
Horseshoe	33	--	33
East Bida	34.8	4.3	39.1
Galaxy and Galaxy II	31.2	--	31.2
Saga	70	60.1	130.1
Belmont (1,2, and 3)	11.6	12.6	24.2
Total Pit Disturbance	**825.6**	**540.5**	**1366.1**
Process Facilities[2]			
Leach Pad 1	65	--	65
Leach Pad 2/3	229	121.3	350.3
Mooney Basin Pad	137.2	272.1	409.3
BMM Process	114	16	130
Mooney Basin Process	11.8	32.9	44.7
Tailings and/or Leach Pad	333	-63.1[4]	269.9
Total Process Disturbance	**890**	**379.2**	**1269.2**
Rock Disposal Areas			
North 1 (One, Two, Three, Five, West Combined	343	333.9	676.9
North 2	--	90.4	90.4
North 3	--	97.4	97.4
North 4 (formerly LJ Ridge)	60	41.4	101.4

COMPONENT	AUTHORIZED DISTURBANCE (ACRES)	PROPOSED ACTION DISTURBANCE (ACRES)	TOTAL DISTURBANCE (ACRES)[1]
North 5	--	141.1	141.1
Rat East	180	-15.6[4]	164.4
Rat West	51	299.5	350.5
RBM North	133	--	133
RBM South	30	--	30
East Sage	250	646.8	896.8
Sage Flat	--	259.1	259.1
South Water Canyon (formerly Top)	263	206.3	469.3
Horseshoe	24.9	--	24.9
Galaxy	29.9	--	29.9
Saga	98.5	121.4	219.9
Belmont	42.7	-3.7[4]	39
Total Rock Disposal Area Disturbance	**1056**	**2218**	**3724**
Support Facilities[3]			
Soil Stockpiles	62.5	93.7	156.2
Ancillary Facilities	78.6	--	90.6
Haul Roads	354.8	159.3	514.1
Interpit Areas	78	420.1	498.1
Water Well #3	1.1	--	1.1
Leach Pad Diversion Ditch	1.4	--	1.4
Galaxy Pit Shortcut	2.8	--	2.8
Secondary Roads/Pit Ramps/Floors	11.2	-11.2[4]	0
Borrow Pits	5.7	-5.7[4]	0
Power Line to Top/Sage Complex	0	14.4	14.4
Landfill	0	0	0
Total Support Facility Disturbance	**596.1**	**682.6**	**1278.7**
Exploration			
Exploration	347.6	100	447.6
Total Exploration Disturbance	**347.6**	**100**	**447.6**
Total Disturbance	**4,165.3**	**3,920.3**	**8,085.6**

[1] Includes BMM and Mooney Basin.
[2] Includes heap leach facilities and process facilities.
[3] Includes interpit areas, temporary roads within the interpit areas, stormwater controls, secondary roads, haul roads, growth medium stockpiles, borrow pits, landfills, power lines, fresh water lines, wells, etc.
[4] Negative numbers indicate that proposed disturbance would take place in an area already authorized to be disturbed; therefore, there would be no net increase in total disturbance for these categories as a result of the Proposed Action.

The following sections describe the components of the Proposed Action. The proposed disturbance areas are designed to accommodate projected disturbance related to the existing operations and the proposed expansions, as well as potential variations resulting from design modifications (i.e., engineering adjustments to the open pit perimeter, haul/access road realignments, and growth medium stockpiles).

The expected mine life for the proposed expansion is approximately 10 years (current operations estimated to end in 2009). Ore processing would continue for approximately three years after active mining operations cease. Reclamation, site closure activities, and post-closure fluid monitoring would continue for a minimum of five years for each closed component. Reclamation monitoring would be conducted for a minimum of three years for each reclaimed area or until vegetative stability is established.

2.3.1 Access

As shown on Figure 1-1, there are three main access routes to the BMM North Operations Area Project:

- From Elko via State Highway 228 (Jiggs Highway) south;
- From Ely and Eureka via U.S. Highway 50 to State Highway 892 (Strawberry Highway); and
- From U.S. Highway 50 to Long Valley Road.

2.3.2 Proposed Action Area

The Proposed Action would unify the BMM and Mooney Basin Plans of Operations Area. The individual Plan of Operations boundaries would be expanded in several directions to accommodate the proposed expansion and associated development of facilities. As shown on Figures 1-2 and 1-3, the two Plans of Operations boundaries would merge where existing haul roads currently connect the BMM and Mooney Basin Operations Area.

The previously authorized Plans of Operations boundaries for both the BMM and Mooney Basin Operation Area encompass 12,727 acres. Expanding and merging the Plans of Operations boundaries would increase the authorized Plan of Operations area by 3,738 acres for a new BMM North Operations Area Project Plan of Operations boundary encompassing 16,465 acres. The total authorized disturbance within this new Plan of Operations boundary would be 8,085 acres (Table 2-4).

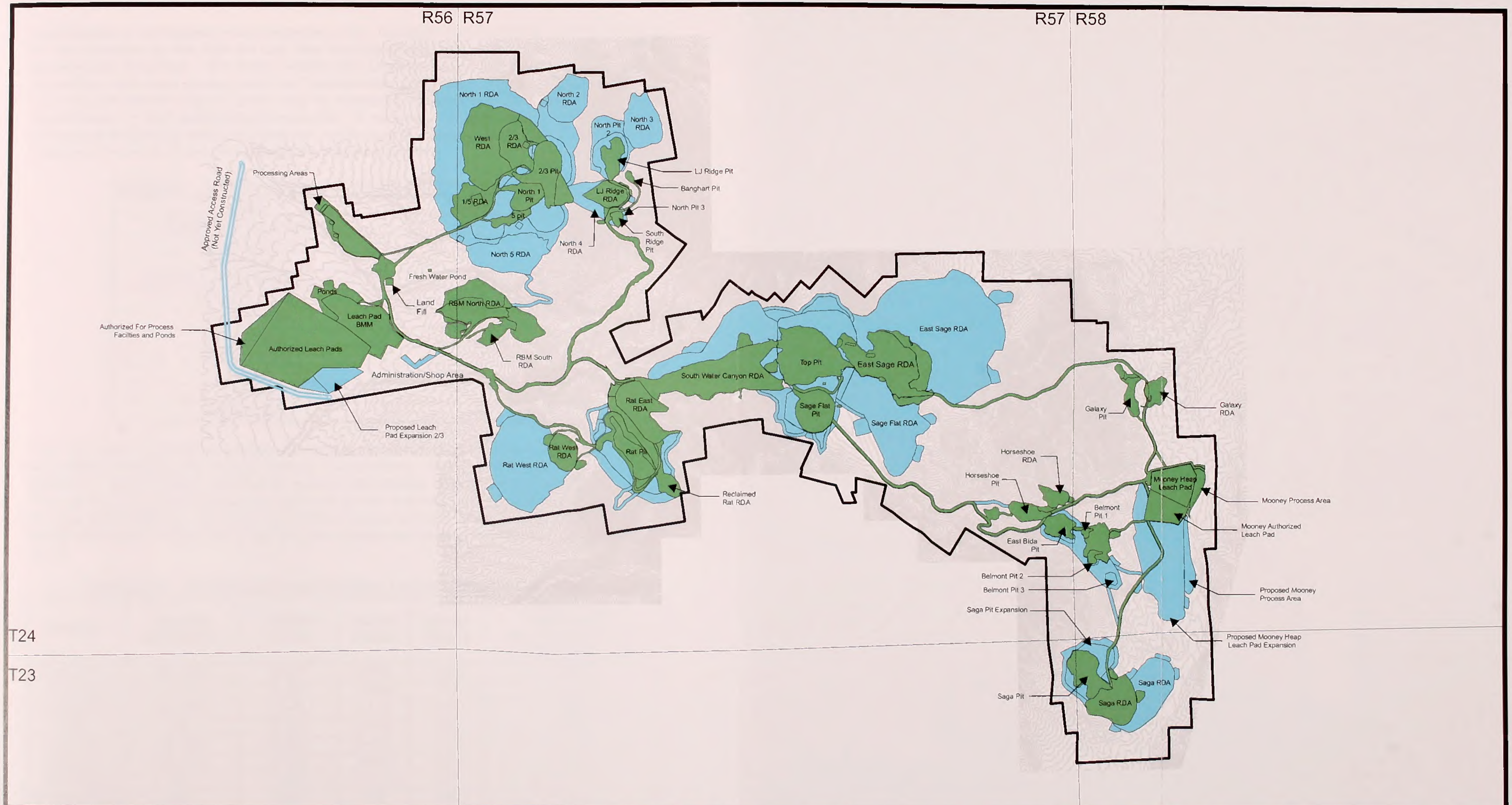
2.3.3 Open Pits

Conventional open pit mining methods (truck and shovel/loader) would continue to be used to extract ore and waste from the proposed open pit expansions. Rock would be drilled and blasted using ammonium nitrate and fuel oil or other appropriate blasting agents as determined by the rock characteristics. All explosives would be handled in accordance with Mine Safety and Health Administration and Bureau of Alcohol, Tobacco, and Firearms regulations. It is anticipated that one blast in each of the active pits would occur each day. The amount of explosive used would vary depending on the size of the working face of the pit. Barrick anticipates two or three pits would be active at any one time.

Trucks would be used to haul ore to the heap leach facilities and waste rock to the rock disposal areas. Low-grade ore material may also be temporarily staged on a selected portion of the rock disposal areas for later transport and processing.

Mining would be conducted 24 hours per day, 7 days per week, as with current operations. A list of the anticipated mining equipment requirements at peak operations within the proposed Plan of Operations boundary is provided in Table 2-5. The equipment indicated in Table 2-5 is an increase from the equipment currently being used.

Geological, geotechnical, and safety constraints have and would continue to dictate the ultimate pit designs. Overall pit slope angles in the existing pits range from approximately 38 degrees to 56 degrees but may vary with pit location and the individual geotechnical and safety constraints for each pit. Based on exploration drilling, no new geologic formations are expected to be encountered under the Proposed Action. Slope angles for the expanded portions of the pits are expected to remain within the same range as the current pit angles. Barrick proposes to mine pits on benches 20 to 25 feet high; however, bench heights may vary based upon mining



Legend

EXISTING/AUTHORIZED DISTURBANCE AREA

PROPOSED DISTURBANCE AREA

NORTH OPERATIONS PROJECT AREA BOUNDARY

N

0 2,500 5,000 7,500

Feet

1:60,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-7
EXISTING/APPROVED AND PROPOSED DISTURBANCE

requirements or rock geotechnical properties. The Top/Sage Flat Pit Complex benches would be approximately 50 feet high but may also vary depending upon mining requirements or rock geotechnical properties. Pit bench widths and intervals would vary by pit and would be dependent upon local geology and rock geotechnical properties. Catch-bench intervals are nominally two bench heights, which may be increased or decreased depending upon mining requirements or rock geotechnical properties. A summary of basic design parameters and dimensions for the pits within the Proposed Action area is shown in Table 2-6. Detailed design parameters for each pit are discussed in the following sections.

TABLE 2-5 LIST OF PROPOSED MOBILE SURFACE EQUIPMENT

UNIT	QUANTITY
Electric Wire Rope Shovels	2
Hydraulic Shovel	2
Wheel Loaders	2
Haul Trucks (150- to 240-ton class)	17
Production Drills	2
Pre-Split Drills	2
Track Dozers	4
Wheel Dozers	1
Graders	3
Trackhoe	1
Water Trucks	3

Open pit design is based on review of previous pit mining data combined with the results of geotechnical testing and surface mining industry/Mine Safety and Health Administration standards. Barrick would continue to monitor wall stability throughout the active life of each open pit according to the parameters set forth by the licensed professional engineer providing pit slope stability design. Monitoring generally includes periodic surveying of pit wall surfaces to identify movement or deflection relative to benchmarks set outside the geotechnical influence of the pit.

TABLE 2-6 PIT DESIGN PARAMETERS AND DIMENSIONS SUMMARY

OPEN PIT	SLOPES (DEGREES)	LENGTH (FEET)	WIDTH (FEET)	DEPTH (FEET)	PIT BOTTOM ELEVATION (FEET ABOVE MEAN SEA LEVEL)
North Pit 1	40 – 50	6,620	3,500	1,100	6,625
North Pit 2	40 – 50	2,460	1,790	775	7,775
North Pit 3	40 – 50	1,130	1,010	625	7,750
Rat	50	4,930	2,190	650	7,625
Top Pit	38 – 56	3,880	3,740	1,725	6,500
Sage Pit	38 – 56	2,445	2,140	1,075	7,150
East Bida	50	1,875	1,190	450	7,050
Belmont Pit 2	50	835	715	275	7,050
Belmont Pit 3	50	665	575	275	6,925
Saga	50	3,000	2,465	700	6,425

Based on extensive area drilling information, Barrick does not anticipate intercepting the groundwater table while mining in the pits located within the Proposed Action area, and no dewatering activities are planned. As is the case with current operations, if any isolated, perched saturated zones are encountered, diversion ditches and sumps would be installed as necessary to maintain safe operating conditions within the pit.

A summary of the mine ore and waste production amounts is presented in Table 2-7. Mined material is currently evaluated, and would continue to be, through quarterly sampling under Nevada Division of Environmental Protection Water Pollution Control Permit requirements. No new rock types or sulfide deposits are anticipated as part of the pit expansions under this Proposed Action. Barrick proposes to continue the current approved waste rock management practice of commingling all waste rock material due to the lack of sulfide content and leachable metalloid and metal contents (BMM, 2009).

TABLE 2-7 ESTIMATED PRODUCTION SUMMARY BY OPERATION AREA

MINE AREA	ORE (MILLION TONS)	WASTE (MILLION TONS)	TOTAL (MILLION TONS)
BMM	130	784	914
Mooney Basin	70	46	116
Total	**200**	**830**	**1,030**

Under the Proposed Action (and as authorized by the State General Stormwater Permit), stormwater would be diverted around the pits, rock disposal areas, and growth medium stockpiles and returned to natural drainages. Stormwater collection trenches would direct stormwater from disturbed areas to collection ponds where stormwater would be evaporated or used in process or mining activities.

North Pits

Exploration is currently the only activity in the vicinity of the proposed North Pit 1. The proposed pit expansion (approximately 172 acres) would merge the existing pits (2/3 Pit, North Pit, and 5 Pit) as shown on Figure 2-3 and described below. Ore would be hauled to the BMM process facilities, and waste rock would be hauled to one of the nearby proposed rock disposal area expansions.

North Pit 2 (formerly the LJ Ridge Pit) would be expanded by approximately 21 acres as shown on Figure 2-3. A typical pit cross-section for the North Pit 2 is shown in Figure 2-8. Ore would be hauled to the BMM process facilities, and waste rock would be hauled to a nearby proposed rock disposal area expansion.

North Pit 3 (formerly the South Ridge Pit) would be expanded by approximately 21 acres as shown on Figure 2-3. Approximately 1.6 acres of the existing LJ Ridge Rock Disposal Area (shown as the North 4 Rock Disposal Area) would be relocated with the proposed pit expansion, and approximately 5.6 acres of existing haul road would be excavated with the proposed pit expansion. Ore would be hauled on the existing haul road to the BMM process facilities, and waste rock would be hauled on the existing haul road to a nearby proposed rock disposal area expansion.

Top and Sage Flat Pit Complex

The Top and Sage Flat pits are currently being actively mined. The Top Pit would be expanded by approximately 173 acres and would merge with the proposed pit limits for the Sage Flat Pit as shown on Figure 2-4. The Sage Flat Pit would also be expanded as shown on Figure 2-4. As in current operations, ore would continue to be hauled to the Mooney Basin process facilities, and waste rock would be hauled to one of the nearby proposed rock disposal area expansions. Weather and/or processing capacity considerations could necessitate periodic

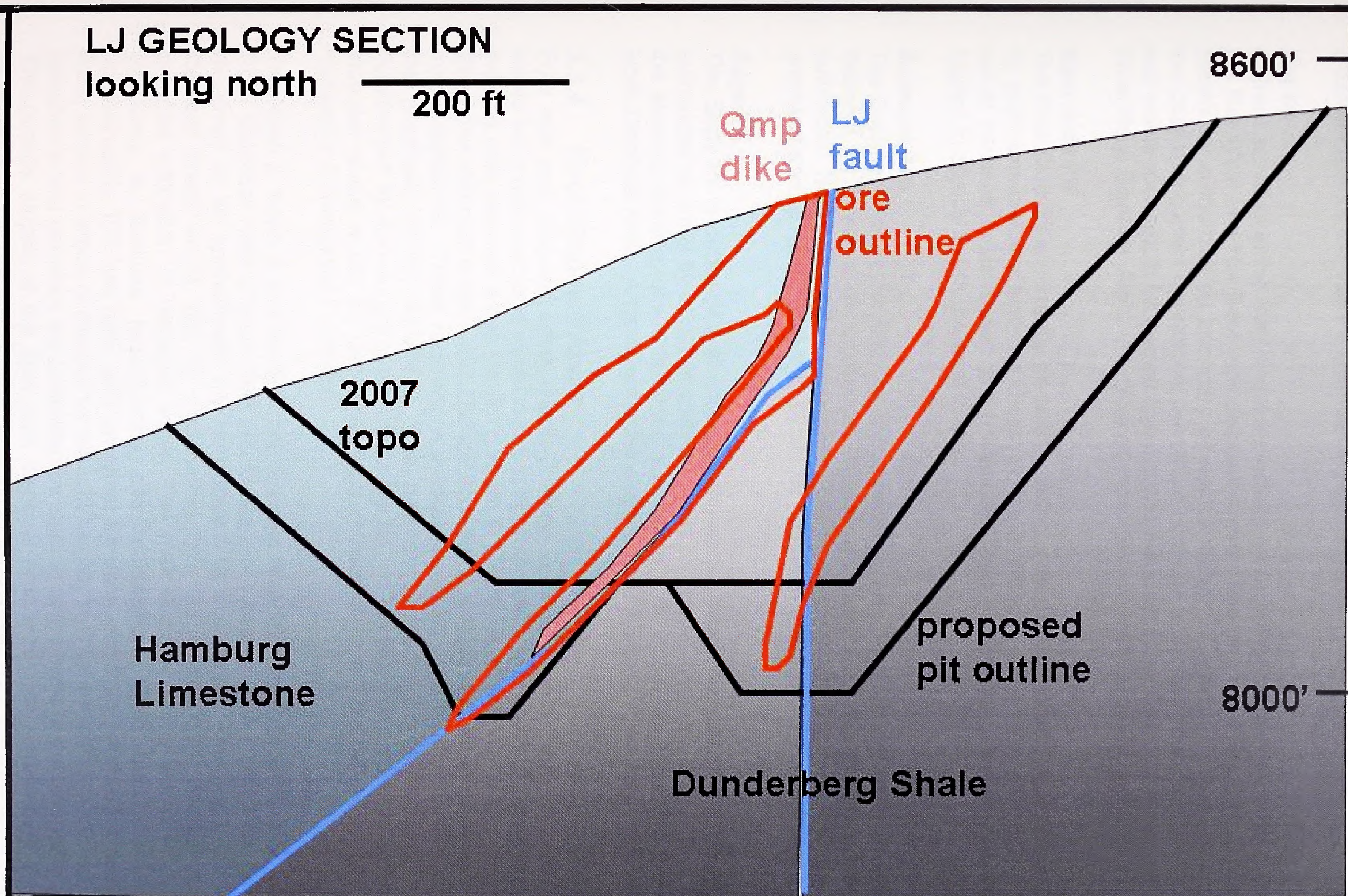


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FIGURE 2-8
OPEN PIT CROSS-SECTION
LJ PIT

deliveries of ore from Top and Sage Pit Complex to the BMM process facility. A typical pit cross-section for the Top Pit is shown in Figure 2-9.

Rat Pit

Current activities in the Rat Pit vicinity include mining of the pit and depositing of waste rock into the Rat West and Rat East rock disposal areas. The proposed Rat Pit boundary expands the previously authorized pit boundary by approximately 77 acres as shown on Figure 2-5. As is the case with current operations, ore would continue to be hauled to the BMM process facilities, and waste rock would be hauled to either the Rat East Rock Disposal Area or the proposed Rat West Rock Disposal Area. A typical pit cross-section for the Rat Pit is shown in Figure 2-10.

East Bida Pit

The East Bida Pit is currently an active mining area. The proposed design would expand the pit by approximately four acres as shown in Figure 2-6. As is the case with current operations, ore would continue to be hauled to the Mooney Basin process facilities and waste rock would be hauled to adjacent rock disposal areas.

Belmont Pits

The Belmont Pits are currently an active mining area. The Belmont Pit 2 would expand and the Belmont Pit 3 would be created as shown in Figure 2-6. No expansion of the previously authorized Belmont 1 pit is proposed. Ore is proposed to be hauled to the Mooney Basin process facilities, and waste rock would be hauled to a nearby rock disposal area.

Saga Pit

The Saga Pit is currently and active mining area. The proposed pit design would expand the authorized pit limits by approximately 60 acres as shown in Figure 2-6. Ore would be hauled to the Mooney Basin process facilities, and waste rock would be hauled to the proposed Saga Rock Disposal Area. A typical pit cross-section for the Saga Pit is shown in Figure 2-11.

2.3.4 Rock Disposal Areas

Four new rock disposal areas (North 2, North 3, North 5, and Sage Flat rock disposal areas) would be constructed and would result in approximately 588 acres of new disturbance. The six existing rock disposal areas (North 1, North 4, Rat West, South Water Canyon, East Sage, and Saga rock disposal areas) would be expanded and would result in approximately 1,649 acres of new disturbance. These rock disposal areas would be used to store waste rock generated by the proposed mining activities. The new and expanded rock disposal areas would be constructed by end-dumping from haul trucks. In general, and as per current practice, rock disposal areas would be developed and reclaimed to an overall slope of 2.5 Horizontal:1 Vertical or 3 Horizontal:1 Vertical.

The North 2, North 3, and North 4 rock disposal areas (Figure 2-3) and the South Water Canyon Rock Disposal Area (Figure 2-4) are located in steeper terrain, and thus portions would be reclaimed to an approximate 2.5 Horizontal:1 Vertical slope. The Saga, Bida, and Top rock disposal areas would also be constructed to a 2.5 Horizontal:1 Vertical slope to limit the potential infiltration of meteoric water. The rock disposal areas would be built as benched structures to facilitate recontouring and reclamation. Each bench would be designed approximately 100 feet high, with an offset for each bench to provide for overall final regrade lines, except in areas of steeper terrain. Lift heights may be as high as 200 feet in steep terrain. Benches would generally be completed by starting at the base of the slope and working upward. The outside slopes of the final rock disposal area would be constructed such that variable topography would result during reclamation sloping. Basic rock disposal area design parameters are summarized in Table 2-8, and additional design details are discussed in the following sections.

Waste rock would be hauled to either the proposed expanded rock disposal areas or to the proposed new rock disposal areas near the pit locations. Figure 1-3 shows the locations of the proposed existing/expanded and new rock disposal areas.

As with current operations, stormwater run-on from undisturbed areas upgradient of disturbed areas would be diverted around the rock disposal areas and returned to natural drainages during operations. Stormwater run-off from disturbed areas would continue to be collected in diversion channels and routed to stormwater collection ponds, where applicable. The diversions would be designed to handle the 100-year, 24-hour storm event. Upon rock disposal area reclamation, diversions may be maintained to provide erosional stability. Rock disposal areas would not be located on any seeps or springs.

TABLE 2-8 ROCK DISPOSAL AREA DESIGN PARAMETERS SUMMARY

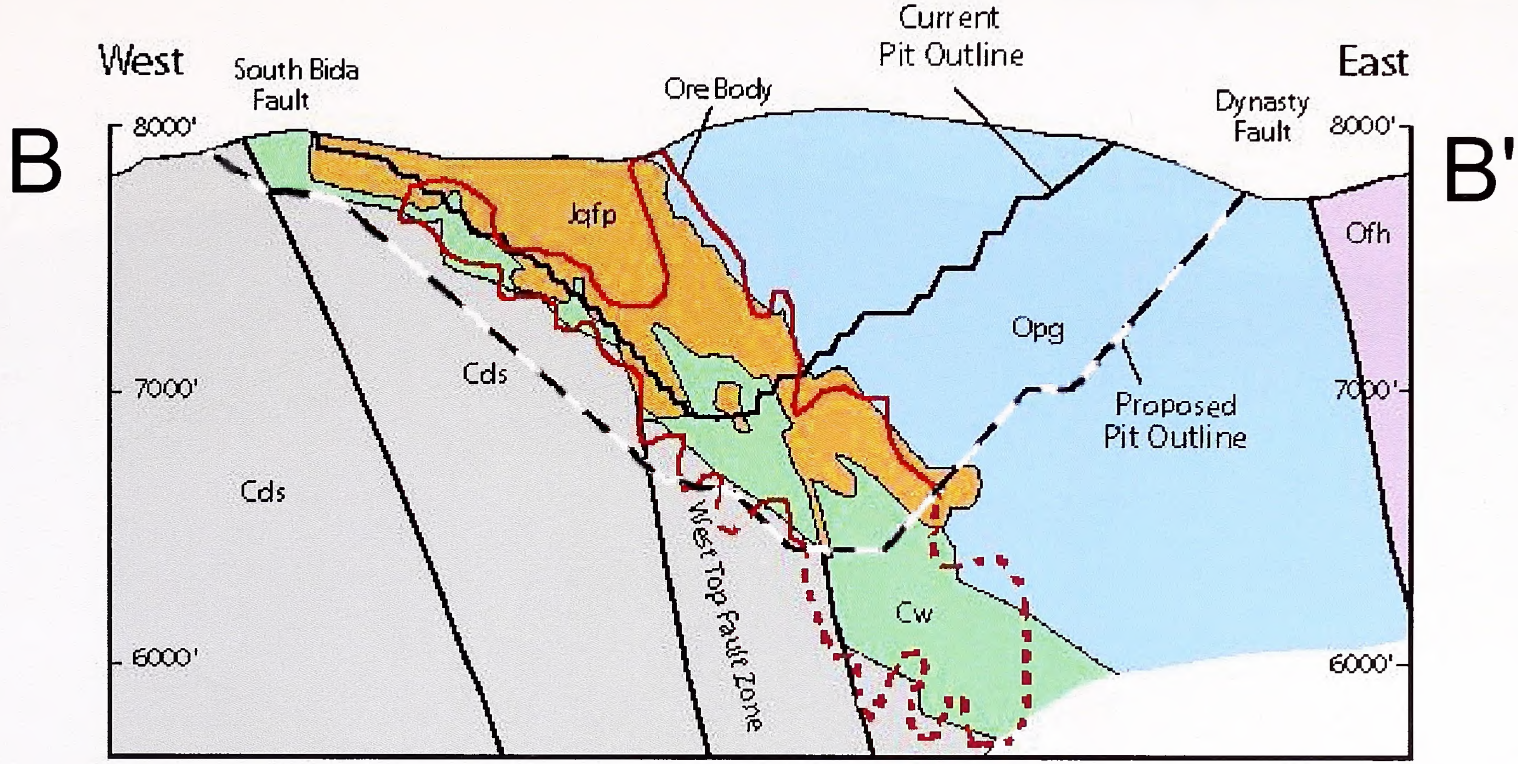
ROCK DISPOSAL AREA	HEIGHT (FEET)	CREST ELEVATION (FEET ABOVE MEAN SEA LEVEL)	INCREMENTAL CAPACITY (MILLION TONS)
North 1	575	7,275	344
North 2	545	7,700	
North 3	670	8,225	
North 4	985	8,335	
North 5	485	7,300	
Rat West	645	7,500	96
South Water Canyon	750	8,175	95
East Sage	1,100	8,100	605
Sage Flat	540	8,000	40
Saga	340	7,000	50

Note: Capacity is incremental capacity for rock disposal area expansions.

Prior to use, the proposed rock disposal area footprints would be cleared of vegetation, and growth medium would be salvaged and placed in proposed or existing growth medium stockpiles. Growth medium includes all salvaged material to be used for covering facilities during reclamation. To facilitate concurrent reclamation, salvageable growth medium would be stockpiled as close to the place of use as possible, including direct placement on top of rock disposal areas. Proposed and existing growth medium stockpile locations are shown in Figure 2-7.

Rock disposal area material would be managed in accordance with the Waste Rock Management Plan (BMM, 2009). Barrick would continue to conduct quarterly geochemical evaluations of the waste rock in accordance with the approved Waste Rock Management Plan and applicable Water Pollution Control Permits. The geochemical characterization program provides representative information from the Meteoric Water Mobility Procedure, total sulfur, and acid base accounting analyses to evaluate the potential to degrade waters of the State.

No new rock types or sulfide deposits are anticipated to be excavated as part of this Proposed Action, and Barrick proposes to continue the current approved waste rock management practice of comingling all waste rock material. Should any unanticipated sulfide/acid-generating material be encountered late in a mining sequence that would limit or preclude effective comingling, neutralizing waste rock from another mining area would be rehandled as necessary and placed both beneath and over the sulfide material in a minimum 50-foot thickness.



TOP PIT GEOLOGY SECTION

Looking North

Legend

Jqfp	Quartz feldspar porphyry	Cds	Dunderburg Shale
Ofh	Fish Haven Dolomite	- - -	Proposed Pit Outline
Opg	Pogonip Group	—	Ore Body Outline
Cw	Windfall Formation		

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FIGURE 2-9
OPEN PIT CROSS-SECTION
TOP PIT

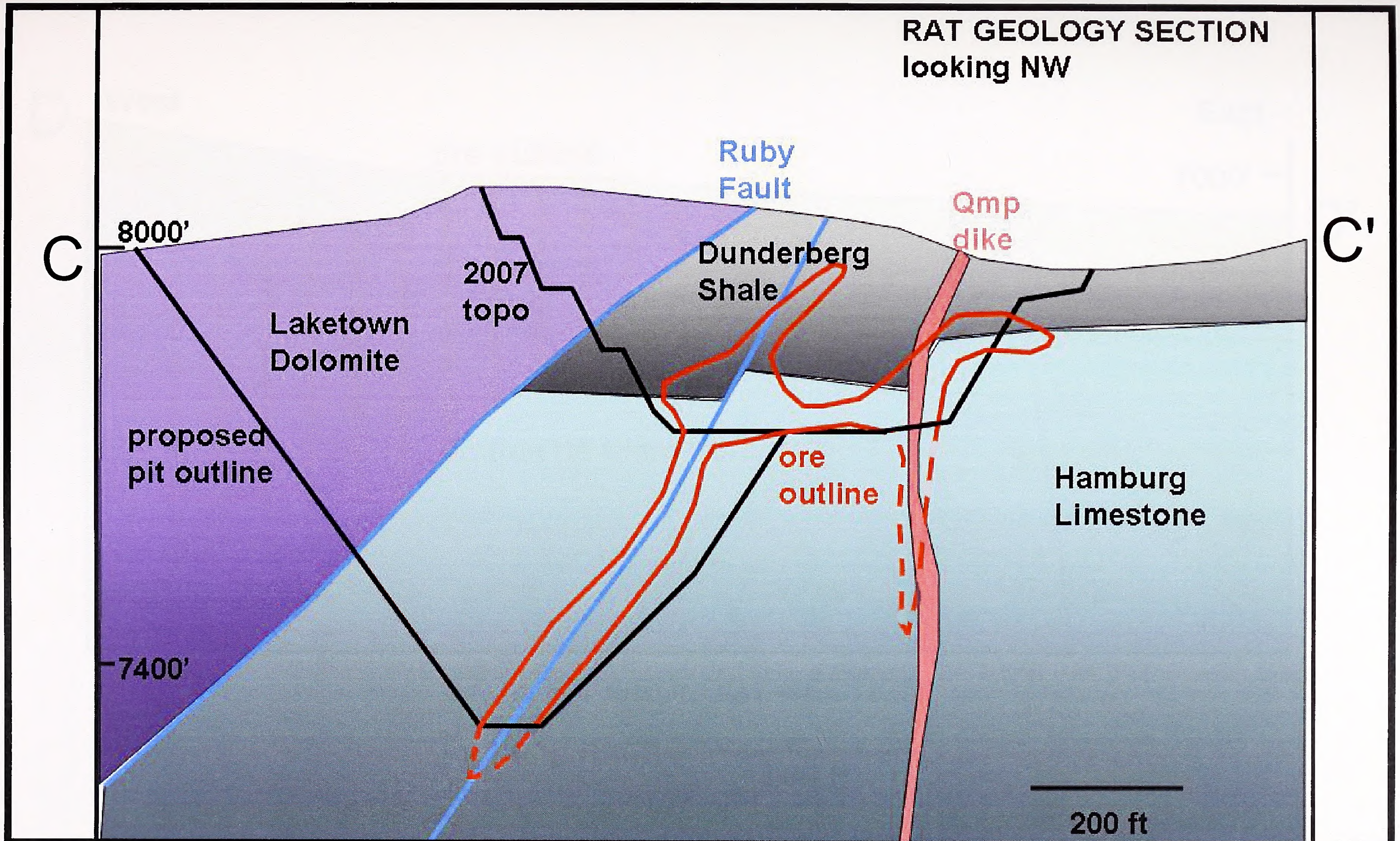

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FIGURE 2-10
OPEN PIT CROSS-SECTION
RAT PIT

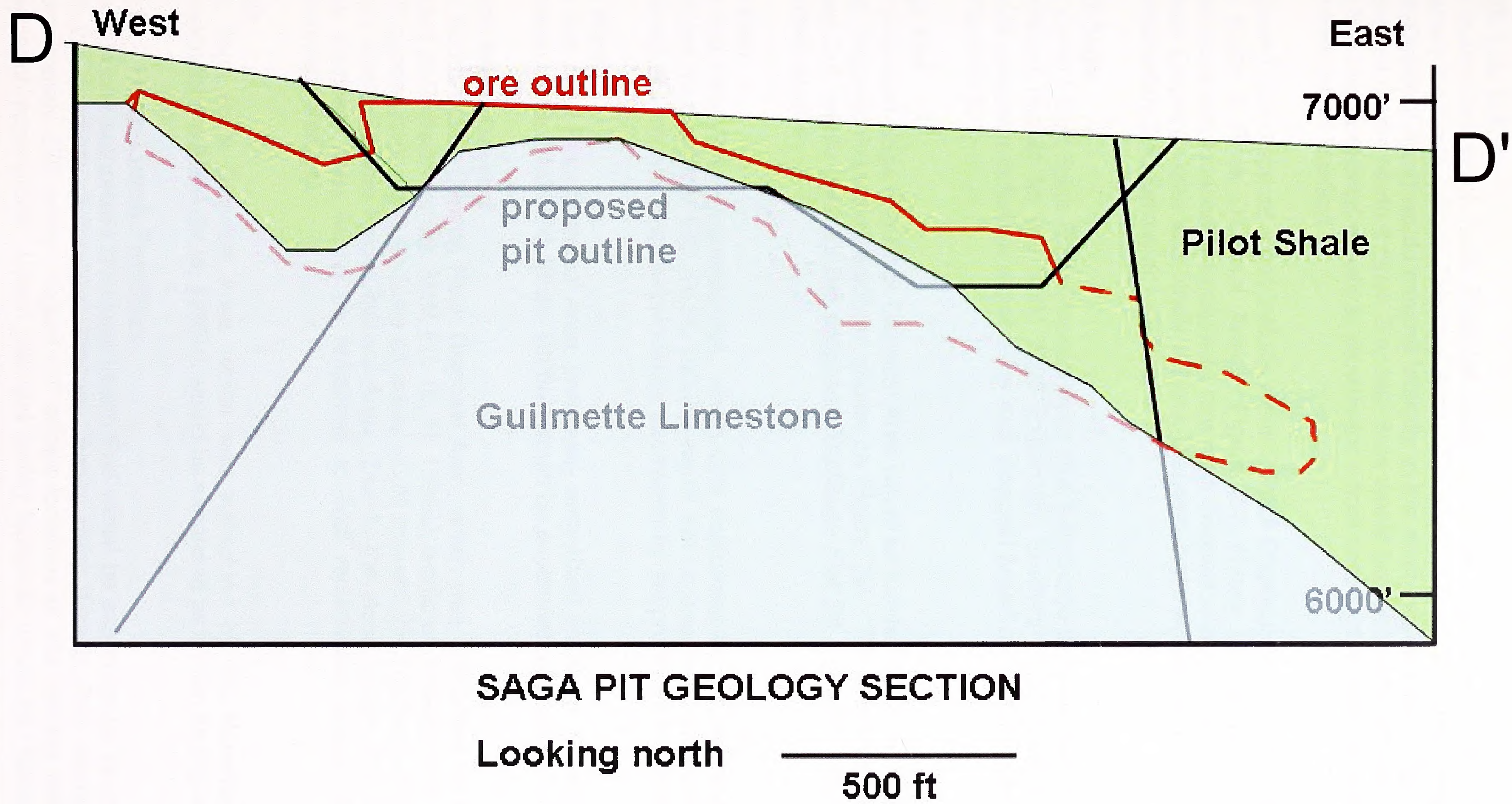

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FIGURE 2-11
OPEN PIT CROSS-SECTION
SAGA PIT

North 1, 2, 3, 4, 5
The authorized West Rock Disposal Area would be expanded to the north and west and renamed the North 1 Rock Disposal Area. The North 4 Rock Disposal Area (formerly LJ Ridge Rock Disposal Area) would expand laterally to the west and vertically (Figure 2-3). Waste rock placement on the North 4 Rock Disposal Area would be completed with bench heights of 100 to 200 feet and horizontal offsets to provide for a final constructed average slope of approximately 2.5 Horizontal:1 Vertical.

Proposed rock disposal areas include North 2 Rock Disposal Area, North 3 Rock Disposal Area, and North 5 Rock Disposal Area. Figure 2-3 shows the proposed rock disposal area expansions and locations of proposed new rock disposal areas. Due to the steep terrain, North 2 Rock Disposal Area and North 3 Rock Disposal Area would have final reclaimed slopes of approximately 2.5 Horizontal:1 Vertical.

East Sage
The current East Sage Rock Disposal Area was authorized by a Decision Record/Finding of No Significant Impact for the BMM 2005 Expansion Environmental Assessment (BLM, 2005b). Barrick proposes to further expand the rock disposal area both laterally and vertically as shown on Figure 2-4.

Sage Flat
The proposed Sage Flat Rock Disposal Area would be located south of the proposed East Sage Rock Disposal Area expansion as shown on Figure 2-4. The proposed haul road, shown on Figure 2-4, would connect the proposed Top/Sage Flat Pit Complex with the Sage Flat Rock Disposal Area.

Rat East
The Rat East Rock Disposal Area, which was authorized by the November 1995 Record of Decision for the BMM EIS (BLM, 1995a), would not be expanded under the Proposed Action; however, a portion of Rat East would be excavated by the proposed expansion of the Rat Pit.

Rat West
The Rat West Rock Disposal Area, previously authorized under the November 1995 Record of Decision for the BMM EIS (BLM, 1995a), would be expanded as shown on Figure 2-5.

South Water Canyon
The South Water Canyon Rock Disposal Area, which was authorized by the November 1995 Record of Decision for the BMM EIS (BLM, 1995a), would be expanded as shown on Figure 2-5. Proposed haul roads and interpit areas would connect the Top/Sage Flat Pit Complex to the South Water Canyon Rock Disposal Area. Due to the steep terrain, the South Water Canyon Rock Disposal Area would be reclaimed to final reclamation slopes of approximately 2.5 Horizontal:1 Vertical.

Saga
The Saga Rock Disposal Area, which was authorized by the November 1995 Record of Decision for the BMM (BLM, 1995a), would be expanded as shown on Figure 2-6.

2.3.5 Heap Leach Facilities
The currently authorized 2/3 Heap Leach Pad would be expanded by approximately 121 acres and the currently authorized Mooney Basin Heap Leach Pad would be expanded by approximately 272 acres. Figure 2-7 shows locations of the existing facilities and proposed heap leach expansions. Leach pad and facility footprints would be cleared of vegetation, and

growth medium would be salvaged and placed in growth medium stockpiles as close to the place of use as possible.

In general, ore would be end-dumped by haul trucks on the leach pads in 10- to 30-foot lifts. If conditions warrant, leach material may also be crushed followed by placement of the ore on the heaps using conveyors and a radial stacker. The need for crushing the ore would be based on future material testing. Seismic analysis and engineering principles would determine the appropriate placement of leach pad catch benches, lift height, maximum heap height, and overall foundation and pad slopes as per State of Nevada requirements. To maintain the reclaimed pad within the perimeter berm, the design would incorporate the principle of constructing the heap leach benches and setbacks or bench widths at an overall angle of 3 Horizontal:1 Vertical. Basic heap design parameters are consistent with existing, approved operations and are shown in Table 2-9. Detailed heap leach facility design is discussed in the following sections.

TABLE 2-9 HEAP LEACH PAD DESIGN PARAMETERS SUMMARY

LEACH PAD	HEAP HEIGHT (FEET)	CREST ELEVATION (FEET ABOVE MEAN SEA LEVEL)	INCREMENTAL CAPACITY (MILLION TONS)
BMM (2, 3, 4, 5)	250	6,810	94
Mooney Basin	250	7,195	124

2/3 Heap Leach Pad

The currently active 2/3 Heap Leach Pad was authorized by the November 1995 Record of Decision for the BMM EIS (BLM, 1995a) for 229 acres of disturbance. The proposed expansion of approximately 121 acres is shown in Figure 1-3.

Approximately 333 acres of disturbance was authorized by the Record of Decision for the 1995 BMM EIS (BLM, 1995a) for development of a tailings storage facility near the 2/3 leach pad. Although the tailings facility was never constructed, the disturbance has been authorized. The proposed expansion of the 2/3 leach pad would disturb approximately 63 acres of this previously authorized disturbance. Thus, Table 2-4 indicates a reduction in total acreage of leach pad disturbance under the Proposed Action.

Mooney Basin Heap Leach Pad

The Mooney Basin Heap Leach Pad and process facilities are currently authorized for 149 acres of disturbance. The proposed expansion of the currently authorized Mooney Basin Heap Leach Pad would disturb approximately 272 acres in the area shown in Figure 2-6. Final design of the proposed process components would be similar to that currently used for the existing leach pads and in accordance with State of Nevada Water Pollution Control Permit requirements.

Design and Operation

The expanded heap leach facilities would be designed to contain leach material and solution in accordance with Nevada Administrative Code 445A.432. Facilities would employ the design principle of 100 percent containment (zero-discharge design) under both normal operating and specific emergency conditions. Solution ponds are ponds that contain the barren and pregnant (gold-bearing) cyanide solution. As with existing facilities, new solution ponds and collection ditches would be double-lined with synthetic liners and would incorporate continuous leak collection and recovery systems between the liners. The solution ponds would be sized and operated to withstand and fully contain all process fluids as well as projected accumulations from a 25-year, 24-hour storm event and sustained power outage. Solution that could be toxic to wildlife and domestic animals would be fenced and covered to prevent access, as required by the NDOW Industrial Artificial Pond Permit.

Before placement on the heap, ore would be amended with lime for pH control as necessary. Either dilute sodium cyanide or dilute calcium cyanide solution would be applied to the ore on the pad. Solution would percolate through the ore to the synthetic liner, flowing via pipes and ditches to a lined pregnant solution pond. The pregnant solution would then be recovered and pumped through carbon columns to load gold onto carbon. Cyanide would be added to the barren solution, which would be re-circulated back to the heap to continue the leaching process.

Loaded carbon would be managed at either BMM or Mooney Basin process facilities or transported to off-site refining facilities. On-site refining entails stripping gold from the carbon in pressure strip vessels and then washing the stripped carbon with acid prior to reactivation in a kiln. The stripped gold is plated onto cathodes in electrowinning cells and these cathodes are placed into a doré furnace. The molten metal is poured into gold doré bars, which are shipped off-site for further refining.

2.3.6 Monitoring Wells

BMM currently has six monitoring wells Bald 1, Bald 2, MWW 1, MWW 1R, MWW 2, and MWW 3. An additional eight wells are proposed to monitor groundwater quality around the site. This includes three wells at proposed Mooney Basin Heap Leach Pad, two wells at Saga rock disposal area, one well at East Sage rock disposal area, and two wells at North 1 rock disposal area. The locations of the existing and proposed monitoring wells are shown on Figure 2-12.

2.3.7 Roads

Roads within the Proposed Action area include existing and proposed haul roads and access roads as shown on Figure 1-3. Roads used for exploration activities have been previously authorized by the BLM, and new exploration access roads within the Proposed Action boundary would continue to be evaluated for potential site specific impacts on cultural resources, wildlife resources, and noxious weeds as they are proposed. Some existing exploration roads would be incorporated into proposed pit expansions; thus there would be a reduction in secondary road disturbance of 11.2 acres, as indicated in Table 2-4. Stormwater and erosion control features for proposed roads would be implemented in accordance with the Stormwater Pollution Prevention Plan (BMM, 2009) that has been prepared in compliance with the Nevada Mining General Stormwater Permit, NVR300000. See Table 2-13 for design features (applicant-committed environmental protection measures).

Public Access

Barrick would restrict public access on existing roads that cross active mining areas in the Proposed Action area, as per Mine Safety and Health Administration requirements. The Proposed Action area would encompass 16,465 acres, an expansion of 3,738 acres from the current BMM and Mooney Basin Plans of Operation boundaries. Public access would be controlled through the guard shack, with fences and locked gates or other physical methods. Once reclamation is complete, public access roads would be re-established for general use.

Haul Roads

The Proposed Action includes widening existing haul roads and developing new haul roads within the Plan of Operations boundary, as shown in Figure 1-3. Maximum running widths (road utilization) would be 110 feet with average total surface disturbance widths of approximately 165 feet. The actual road disturbance width (running width plus berms and cut-fill areas) would vary depending on topography. Approximately 159 acres of disturbance would result from construction of new haul roads and expansion of existing haul roads. Haul road berms would be designed to facilitate mule deer migration, as identified as a key issue for wildlife.

Haul roads that are shown in interpit areas have been included with the surface disturbance associated with those facilities. Portions of the existing haul road, such as that between the North 1 Pit and the heap leach facilities, would become part of proposed rock disposal area disturbance (Figure 1-3). Haul roads that cross rock disposal areas, or are ultimately covered by reclaimed rock disposal areas, are included in the rock disposal area surface disturbance acreage.

2.3.8 Employment

Barrick presently employs approximately 180 to 210 full-time and 50 to 100 contract employees at the BMM. This Barrick staffing level is expected to increase approximately 50 percent under the Proposed Action with only a minor increase in contract employees (5 to 10). The total work force under the Proposed Action would be approximately 275 to 325 at peak levels.

2.3.9 Transportation

Employees would continue to be transported in buses and/or vans to the mining areas from Elko, Ely, and Eureka via the access routes shown in Figure 1-1. It is anticipated that one bus would be added to the fleet of two buses currently used. The additional bus would likely be added to the Elko route. The mine's Employee Handbook strongly encourages employees to use company-provided transportation to the mine instead of personal vehicles. In practice, employees rarely use personal vehicles unless they miss the bus or van. The high cost of personal transportation is a strong incentive to use company-provided transportation.

Bulk chemicals and supplies would typically be transported to the site on trucks via one of the following access routes:

- From Ely or Eureka via U.S. Highway 50 to State Highway 892 (Strawberry Highway) to the BMM operations; or
- From Ely via U.S. Highway 50 to Long Valley Road to the Mooney Basin Operations Area.

Bulk chemicals and supplies are not typically transported from Elko via Highway 228. There are no current restrictions on delivery times, and no restrictions are proposed. It is estimated that deliveries would increase 10 to 15 percent, to 1,500 trips per year.

2.3.10 Support Facilities

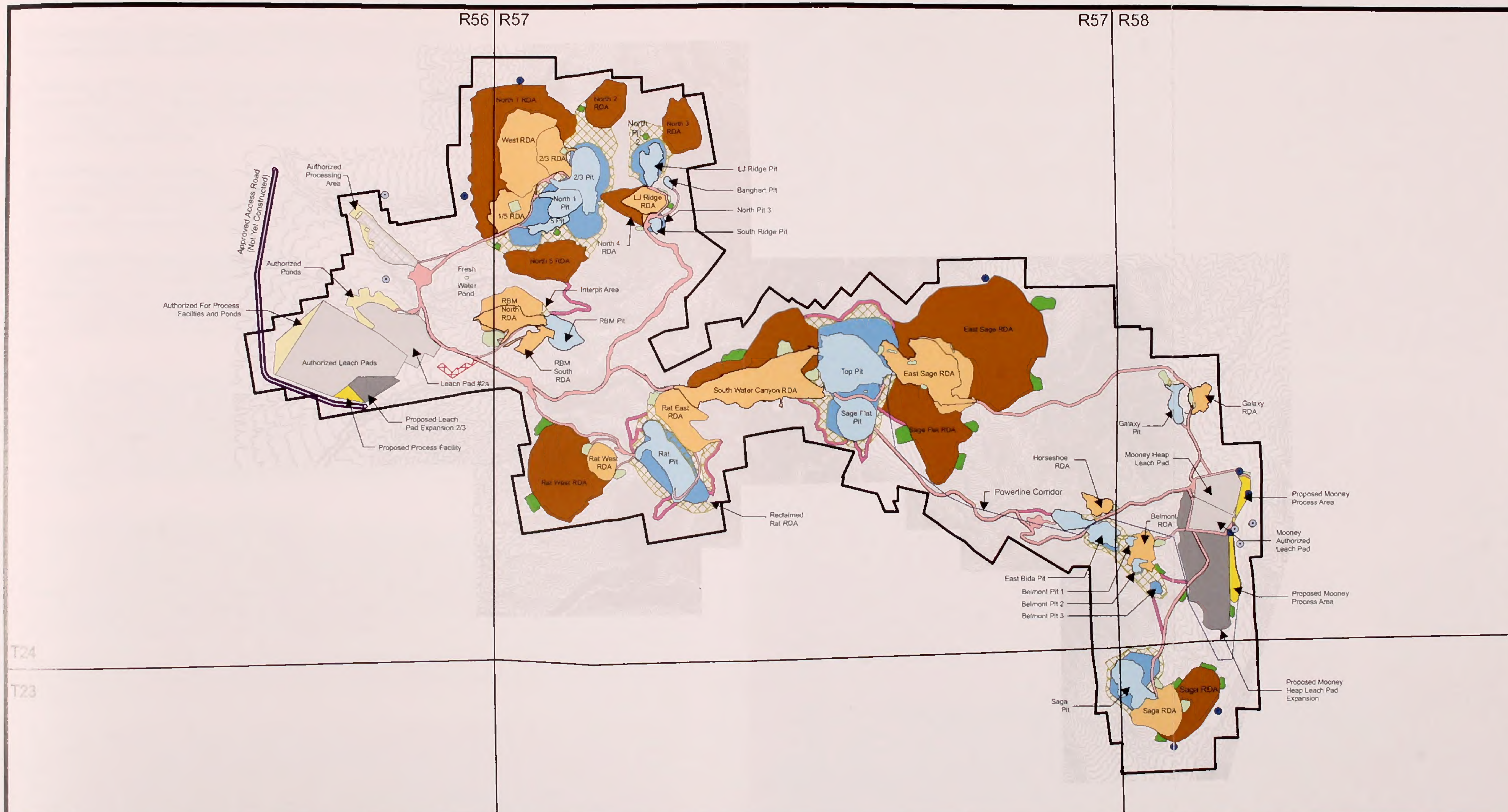
Surfaces for the support facilities described below would be grubbed (removal of vegetation) and cleared. Salvageable growth medium would be stockpiled in nearby existing or proposed stockpiles for use in reclamation when the facilities are no longer needed.

Power Lines and Substations

A new power line is proposed from the substation near the Mooney Basin process facilities to the Top/Sage Pit Complex area (Figure 1-3), resulting in 14.4 acres of disturbance. A substation would be located near the Top Pit haul road intersection, and line power would be run to the Top/Sage Pit Complex for mining/equipment needs and the proposed maintenance shop.

Freshwater Supply

BMM would continue to utilize existing water wells (Figure 1-2) located on-site for fresh and potable water supplies. BMM would install a treatment system to treat groundwater produced



Legend

- North Operations Project Boundary
- Powerline Corridor
- Approved Access Road
- Authorized/Existing Haul Road
- Authorized/Existing Pit
- Authorized/Existing RDA
- Authorized/Existing Growth Media Stockpile
- Authorized/Existing Process Facilities and Ponds
- Authorized/Existing Leach Pad
- Authorized/Existing Monitoring Well
- Proposed Growth Media Stockpile
- Proposed Haul Road
- Proposed Process Facilities and Ponds
- Proposed RDA
- Reclaimed RDA
- Proposed Monitoring Well
- Proposed Leach Pad
- Proposed Pit
- Proposed Administration/Shop Area
- Reclaimed Leach Pad
- Interpit Area

N

0 2,500 5,000 7,500
Feet
1:60,000

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FIGURE 2-12
MONITORING WELL LOCATIONS

from an existing well in order to provide drinking water for the site. There would be an increase of approximately 250 acre-feet per year of ground water pumping.

Additional permits for water systems would be acquired, as needed, for supply and distribution systems that meet or exceed State standards for the number of users or number of connections. Depending on existing well productivity, new wells could be developed to insure adequate supply for site operations.

Growth Medium Stockpiles
Where possible, growth medium stockpiles would be located within interpit areas or on the top of existing rock disposal areas. Alternatively, stockpiles could be located at the base of proposed rock disposal areas and heaps as shown on Figure 1-3.

Yards (Shop Areas and Storage Areas)
A shop area is proposed within the existing East Sage Rock Disposal Area boundary on the southern edge; thus, no new disturbance would result. The shop would accommodate three to four large pieces of equipment and include an oil/lube storage area and fuel island. Existing shop facilities at BMM would also be expanded or modified to accommodate new equipment sizes.

2.3.11 Hazardous Materials

This section describes the quantities of additional mine process chemicals and fuel, transportation of these materials, and on-site storage. Emergency response procedures for transport accidents and for release from storage and processing facilities are also discussed. Types, quantities, and disposal methods for hazardous materials and other wastes that would be generated under the Proposed Action are expected to be similar to current amounts and procedures.

Chemical Transportation and Storage
As described in the draft Spill Contingency Plan (BMM, 2009), the primary chemicals and fuels to be used as part of the Proposed Action consist of sodium or calcium cyanide, diesel fuel, ammonium nitrate, sodium hydroxide, propane, lime, gasoline, carbon, and anti-scalant. These chemicals do not differ in type from those currently utilized at the existing operations, but there would be larger quantities (Table 3-34). Trucks transport chemicals to the BMM and Mooney Basin Operations Area sites on an as-needed basis.

The transportation routes for chemicals and petroleum products to the BMM North Operations Area Project would remain unchanged from current delivery routes, which are identified in Section 2.3.9.

Currently approved staging facilities, safety measures, transportation, and handling requirements that are already in use would continue to be utilized. Any new storage areas would be constructed as authorized with 110 percent secondary containment, where appropriate. Sodium cyanide is and would continue to be stored in areas that are physically separated from acid storage areas. Chemical storage areas are shown on Figure 2-1. Blasting agents and explosives would continue to be stored and used on-site in accordance with Mine Safety and Health Administration (30 Code of Federal Regulation 56E) and Bureau of Alcohol, Tobacco, and Firearms regulations.

Emergency Planning and Response
The transportation, storage, and use of fuels, explosives, and reagents require adherence to applicable regulations and guidelines established and enforced by the Nevada Division of

Environmental Protection, U.S. Department of Transportation, Nevada Department of Transportation, Bureau of Alcohol, Tobacco, and Firearms, Department of Homeland Security, and Mine Safety and Health Administration. The site Emergency Response Plan (BMM, 2009) has been updated for the existing approved plans for the BMM and Mooney Basin Operations Area. The purpose of an Emergency Response Plan is to establish responsibilities and guidelines for actions to be taken by mine personnel in the event of an emergency at the mine. The plan identifies potential sources of spills, establishes measures of prevention, and defines control, cleanup, and reporting procedures in the event of a hazardous material spill, petroleum release, or natural disaster. The plan contains procedures for response to on- and off-site incidents.

A fluid management plan is required by the Nevada Division of Environmental Protection for each Water Pollution Control Permit. This plan provides designs and operational descriptions of the fluid management systems in place for process facilities that provide containment of process fluids during normal and unusual natural or operational events. These plans are currently in place and would be updated as part of the Nevada Division of Environmental Protection permitting process for any new process components associated with the Proposed Action.

Reporting and Notification

BMM and Mooney Basin Operations Areas have currently approved Emergency Response Plans. The updated site plan would be submitted to the applicable agencies for approval prior to commencement of expanded process operations. With an approved plan, state and federal reporting requirements for qualifying releases consist of notification by telephone no later than 5 p.m. of the next regular work day from the time of the incident to:

- Nevada Division of Environmental Protection's 24-hour emergency notification number at 888-331-6337;

- Nevada Division of Emergency Management at 775-687-4240 during normal working hours or at 775-687-5300 after hours;

- Local Emergency Planning; and

- National Response Center at 800-424-8802.

Waste Management

No change to the existing non-hazardous solid waste streams (types and sources of non-hazardous waste) would occur as a result of the Proposed Action. The currently authorized BMM Class III waivered landfill location would continue to be utilized for the Proposed Action, and an additional landfill site may be developed in the Mooney Basin Operations Area to accommodate expanded operations. The new landfill location is in a previously disturbed area associated with the Saga rock disposal area and is shown on Figure 2-6. When an appropriate site has been finalized, a permit application for the landfill would be submitted for approval by the Nevada Division of Environmental Protection. The landfills can accept approved non-hazardous wastes including glass, plastics, waste paper, wood, scrap metal, used tires, and non-hazardous laboratory wastes. An approved management plan for the landfill lists the allowable materials types, weekly maintenance programs, inspection programs, and closure requirements. Maintenance activities include weekly cover of the waste material. Inspections are conducted weekly to insure adequate cover placement, containment of waste material, and control of stormwater.

The Nevada Division of Environmental Protection, Bureau of Waste Management regulates the hazardous waste program in the State of Nevada. Its role, as defined in Nevada Revised Statutes 459.400, is "to protect human health, public safety and the environment from the effects of improper, inadequate or unsound management of hazardous waste; establish a program for regulation of the storage, generation, transportation, treatment and disposal of hazardous waste; and ensure safe and adequate management of hazardous waste." The Nevada Division of Environmental Protection hazardous waste program is responsible for permitting and inspecting hazardous waste generators and disposal, transfer, storage, and recycling facilities. It is also responsible for enforcing State hazardous waste statutes and regulations and is authorized to enforce Federal hazardous waste regulations in lieu of the Environmental Protection Agency. The State of Nevada has adopted by reference, with certain modifications, the Federal hazardous waste regulations.

Hazardous waste management is subject to specific requirements that are dependent upon the amount of hazardous waste produced at a facility in a calendar month. The BMM and Mooney Basin Operations Areas are currently classified as a Small Quantity Generator of hazardous waste as defined by the Resource Conservation and Recovery Act. Facilities with this classification generate less than 1,000 kilograms (2,200 pounds) of hazardous waste in a month. No change in classification is expected due to the Proposed Action.

No new hazardous waste streams would be generated as part of the Proposed Action. The practice of recycling used oil, antifreeze, solvents, and batteries would continue under the Proposed Action. Currently authorized temporary on-site hazardous waste storage areas would be utilized for any hazardous waste generated under the Proposed Action. All off-site, manifested transfers to treatment, storage, and disposal facilities would continue in accordance with the Resource Conservation and Recovery Act, Nevada Division of Environmental Protection, and Nevada Department of Transportation regulations.

2.3.12 Public Safety

The Proposed Action boundary is only partially fenced due to existing topography and the size of the Proposed Action area. Barrick currently utilizes and will continue to provide public safety controls for the mine site to limit public access to the extent possible. Public safety measures used at the facility include security fences located at the two entrances to the mine site, fencing around potentially hazardous areas such as the heap leach pads, process ponds, and process buildings, and construction of berms along haul roads to prevent access to these roads. All chemicals on-site are stored in secure buildings at locations throughout the mine site.

Other general safety measures used at the mine site include the following:

- Speed limits are posted and enforced on access routes and on roads throughout the project site;
- Warning signs are posted in areas where flammable materials and hazardous materials are stored and in areas where conditions warrant posting of signs;
- Training is conducted for all employees as required by the Mine Safety and Health Administration;
- All other Mine Safety and Health Administration training and safety requirements are followed and enforced by Barrick.

2.3.13 Building Inventory

There are numerous buildings associated with the existing operation. These buildings would remain in place and be used for the same purposes as with the existing operation. Only one new structure is planned with the Proposed Action. As part of the Proposed Action, a new vehicle maintenance building would be constructed in the Top Pit area. In addition, the maintenance building at BMM would be expanded to allow maintenance of the larger equipment planned under the Proposed Action. The following provides a list of the current structures at the site.

Bald Mountain Buildings

- Main Office
- EHS Office
- Geology Office
- Truck Shop/Warehouse
- Main Process
- Process Trailer #1
- Process Trailer #2
- Mine Operations Office
- Geology/Core Shed
- Guard Shack/Ambulance Bay
- Assay Lab
- Wash Bay
- Tire Pad/Shop
- Electrical Shop
- Mobile Storage Trailers (10 total)

Mooney Basin Buildings

- Main Process
- Mooney Process Trailer #1
- Mooney Process Trailer #2
- Communications Center

All of these structures meet the "Reasonably Incident" definition in 43 CFR 3715.0 – 5, and the activities that are the reason for occupancy as specified in 43 CFR 3715.2.

2.3.14 Reclamation Plan

Reclamation activities described in this section would be implemented for the facilities or disturbance associated with the Proposed Action. Reclamation of current or existing facilities has been addressed and approved under the previously approved Plans of Operations and reclamation permit. Reclamation of disturbed areas resulting from activities associated with the Proposed Action would be completed in accordance with BLM and Nevada Division of Environmental Protection regulations. BLM Surface Management Regulations, 43 Code of Federal Regulation 3809, establish procedures and standards for prevention of unnecessary or undue degradation of public lands by operations authorized by the mining laws and provide for the maximum possible coordination with appropriate State agencies to avoid duplication. The State of Nevada requires that a reclamation plan be developed for any new mining projects or expansion of existing operations (Nevada Revised Statute 519A). The BMM North Operations Area Project Reclamation Plan (BMM, 2009) incorporates previously authorized reclamation plans and addresses activities associated with the Proposed Action.

The objectives of the proposed reclamation program are as follows:

- To provide a stable post-mining landform that supports defined land uses;
- To minimize erosion damage and protect water resources through control of water run-off and stabilization of components;
- To establish post-reclamation surface soil conditions conducive to the regeneration of a stable plant community through stripping, stockpiling, and reapplication of soil material;
- To revegetate disturbed areas with a diverse mixture of plant species in order to establish productive plant communities compatible with existing land uses;
- To maintain public safety by stabilizing or limiting access to mine features that could constitute a public hazard; and
- To minimize impacts to visual resources.

Schedule
Under the Proposed Action, the BMM North Operations Area Project would be active for approximately 10 years. The combined life of the current and Proposed Actions, including mining, ore processing, and most reclamation, is estimated to extend to the year 2020. Closure activities, final reclamation, and post-closure monitoring may extend several years beyond that date. The projected reclamation schedule is provided in the BMM Plan of Operations (BMM, 2009).

Concurrent reclamation would occur when practical and safe. Concurrent reclamation would involve contouring and revegetating the permanently inactive areas during operations. Upon completion of mining, final recontouring and seeding would be completed pursuant to the Reclamation Plan and Final Permanent Closure Plan as approved by the Nevada Division of Environmental Protection and BLM.

Post-Mining Land Use
The post-mining land use would be consistent with pre-mining land uses, including mineral exploration and development, livestock grazing, wildlife habitat, and dispersed recreation. Barrick would work with the agencies and local governments to evaluate alternative land uses that could provide other socioeconomic benefits from the mine infrastructure. The proposed reclamation activities and post-mining land uses are designed to be in conformance with the approved Ely District Record of Decision and Approved Resource Management Plan (BLM, 2008) and with White Pine County zoning ordinances.

Post-Mining Topography
Large constructed topographic features, such as rock disposal areas and heap leach pads, may have rounded crests and variable slope angles to resemble natural landforms, as well as interspersed rock piles or rock features. The final reclamation configuration would provide a stable post-mining landform as determined by both seismic and erosional performance (Figure 2-13). Slopes would be regraded to either 2.5 Horizontal:1 Vertical (in select cases) or 3 Horizontal:1 Vertical or shallower. To limit erosion, growth medium would be placed on the regraded surface and the surface would be seeded. The open pits would remain as open pits with safety berms to preclude vehicular access to the pits. Post-reclamation topography is provided in the BMM (2009) Plan of Operations.

Growth Medium Management

Growth medium would be salvaged prior to construction of any proposed mine component, including pits. The growth medium would be recovered where available, targeting minimum reclamation cover volumes for nearby components. The targeted depth of growth medium on reclaimed surface will be dependent on the specific component. Minimum depths for growth medium placed on reclaimed surfaces range from six (six to 12 inches on waste rock areas) to 24 (heap leach pads) inches. It is anticipated that all areas affected by the Proposed Action, except areas limited by topography, would have available growth medium removed and placed into stockpiles. All salvageable growth medium would be removed from these areas. The growth medium would be placed in segregated stockpiles located near the components for which the material would be used and in such a manner as to reduce degradation of the material by wind and water erosion. Stockpiles that would remain in place throughout a growing season would be seeded with an interim seed mixture (Table 2-10) to help stabilize the material and minimize non-native species establishment.

TABLE 2-10 INTERIM SEED MIXTURE FOR GROWTH MEDIUM STOCKPILES

SPECIES	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
Agropyron smithii	Western wheatgrass	3.0
Elymus trachycaulus ssp.	Slender wheatgrass	1.0
Melilotus officinalis	Yellow sweetclover	3.0
Onobrychis viciifolia	Remont sainfoin	1.0
	Total	**8.0**

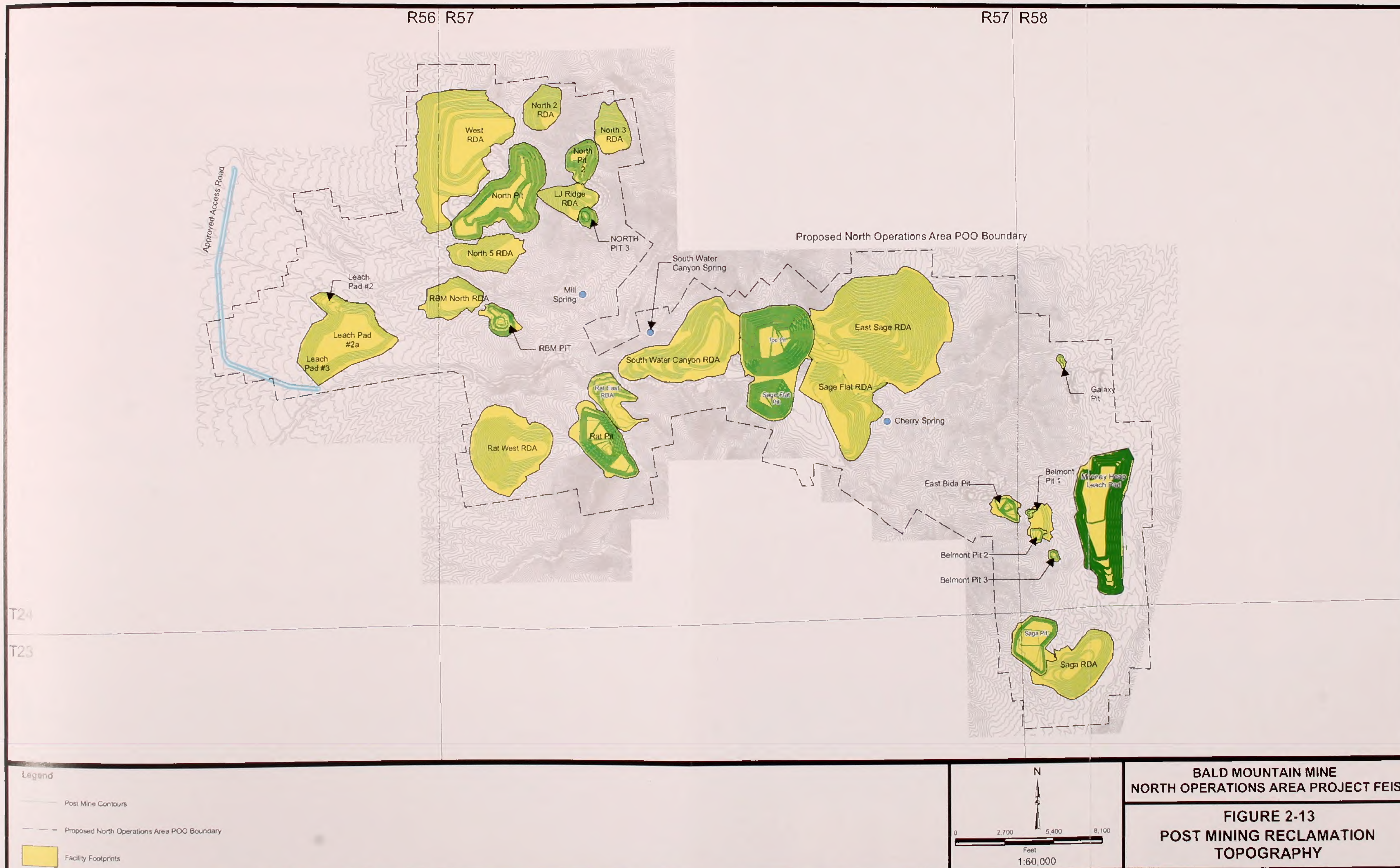
Revegetation

Reclaimed surfaces would be revegetated to reduce run-off and erosion, provide forage for wildlife and livestock, control invasive weeds, and reduce visual impacts. Seed would be applied with a rangeland drill, hydroseeder, or mechanical broadcaster and harrow, depending upon accessibility. Seedbed preparation and seeding would typically take place between the BLM-recommended dates of October 1 and March 15 of each year after grading and growth medium placement activities are complete. Seeding outside these dates may occur depending on weather conditions.

Two reclamation seed mixtures and application rates have been approved by the BLM for the authorized facilities: one for elevations above 7,000 feet and a second for elevations below 7,000 feet, as shown in Tables 2-11 and 2-12. The plant species in these seed mixtures have the ability to grow within the constraints of the low annual precipitation experienced in the region and are suitable for the site elevation, soil types, and aspects. The plants also provide erosion protection as well as forage and cover characteristics similar to the pre-disturbance conditions, thus facilitating post-mining land use.

The proposed seed mixtures and application rates would be subject to modification based upon the actual results of concurrent reclamation within the Proposed Action area, revegetation test plots, or changes by the BLM to the seed mix recommendations.

Revegetation monitoring has been ongoing at the existing, authorized facilities to evaluate and select successful, site-specific reclamation measures that would achieve the reclamation standards or to demonstrate the need to plant species mixes that would be adaptable to different geomorphic settings expected within the reclaimed Proposed Action area, including different aspects and soil or growth medium amendments. Various surface preparation techniques would continue to be evaluated for their success in promoting plant establishment and resistance to soil erosion. This program has been implemented in the past in coordination



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-13
POST MINING RECLAMATION TOPOGRAPHY

with BLM and Nevada Division of Environmental Protection, and results from this program would be used in determining proper revegetation methods for approved and proposed disturbance.

TABLE 2-11 RECOMMENDED SEED MIXTURE BELOW 7,000 FEET

SPECIES	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
Pseudoroegneria spicata spp. spicata	Bluebunch wheatgrass	1.0
Agropyron smithii	Western wheatgrass	1.5
Leymus cinereus	Great Basin wildrye	1.0
Achnatherum hymenoides	Indian ricegrass	0.5
Elymus lanceolatus spp. lanceolatus	Thickspike wheatgrass	1.5
Elymus elymoides	Bottlebrush squirreltail	0.5
Poa secunda	Sandberg's bluegrass	0.1
Linum lewisii	Appar blue (Lewis') flax	0.5
Onobrychis viciifolia	Remont sainfoin	2.0
Penstemon palmeri	Palmer's penstemon	0.1
Atriplex confertifolia	Shadscale	1.0
Atriplex canescens	Fourwing saltbush	1.0
Chrysothamnus viscidiflorus	Douglas' rabbitbrush	0.1

Note: The above is a list of BLM-approved reclamation species; the actual seed mix would vary from one area to another. BLM and NDOW would approve the actual seed mix before seeding of a particular area.

TABLE 2-12 RECOMMENDED SEED MIXTURE ABOVE 7,000 FEET

SPECIES	COMMON NAME	PURE LIVE SEED (POUNDS PER ACRE)
Artemisia tridentata ssp. *vaseyana*	Mountain big sagebrush	0.1
Purshia tridentata	Antelope bitterbrush	0.5
Linum lewisii	Appar blue (Lewis') flax	0.1
Balsamorhiza sagittata	Arrowleaf balsamroot	0.5
Penstemon palmeri	Palmer's penstemon	0.1
Pseudoroegneria spicata spp. spicata	Bluebunch wheatgrass	2.0
Elymus trachycaulus ssp.	Slender wheatgrass	1.0
Elymus lanceolatus ssp. *lanceolatus*	Thickspike wheatgrass	1.0
Poa canbyi	Canby's bluegrass	0.1
Leymus cinereus	Great Basin wildrye	1.0
Achnatherum hymenoides	Indian ricegrass	0.5
Elymus elymoides	Bottlebrush squirreltail	0.5

Note: The above is a list of BLM-approved reclamation species; the actual seed mix would vary from one area to another. BLM and NDOW would approve the actual seed mix before seeding of a particular area.

Revegetation efforts would be determined to be successful and complete upon demonstrating compliance with Nevada Guidelines for Successful Reclamation (NDEP, 1998) and upon approval by the BLM and Nevada Division of Environmental Protection. The results of revegetation monitoring would be used in conjunction with these guidelines to determine applicable vegetation release criteria under the Proposed Action.

Surface Water and Sediment Control
Surface water would be diverted around mine features through primary stormwater diversions, culverts, and secondary perimeter berms and/or ditches. Silt fences, sediment traps, and/or other erosion control measures would be used to prevent migration of sediment from disturbed areas until reclaimed slopes and exposed surfaces are stabilized. A preliminary Stormwater Pollution Prevention Plan has been prepared and is part of the Proposed Action. This draft plan is based on existing stormwater controls and outlines potential sources of stormwater pollution and erosion control measures that may be used during operations.

Open Pits
Mining would result in excavations to varying depths. Overall, pit slopes would range from approximately 38 degrees to 56 degrees, depending on rock type and geotechnical considerations. Ongoing geotechnical and slope movement monitoring studies would be used to evaluate the safety of open pit slopes. During final reclamation, a berm would be constructed along open pit crest areas to control and prevent access by people and livestock.

Rock Disposal Areas
The rock disposal areas would be reclaimed to meet certain objectives including reduced slope erosion, mass stability, rounded edges, revegetated surfaces, reducing meteoric infiltration, and rates of soil loss consistent with the surrounding topographic features. The final slopes of the reclaimed rock disposal areas would vary, with slopes of 2.5 Horizontal:1 Vertical or shallower and slight benches remaining at required intervals to reduce surface water flow velocities and erosion. As shown in the Revised Universal Soil Loss Equation analyses (BMM, 2009), reducing the slope length by providing a horizontal catch bench results in significantly less potential erosion from rock disposal area surfaces. The tops of the Saga, Bida and Top rock disposal areas would be rounded to promote meteoric water run-off and eliminate large, flat surfaces which could allow water to pond and infiltrate.

As the rock disposal areas reach their ultimate configurations and become inactive, the face would be regraded. Once regraded, the surface would be covered with stockpiled growth medium. The targeted depth for growth medium on the rock disposal areas is between six and 12 inches. Depending upon location, the area would then be seeded with the seed mixture shown in either Table 2-11 or Table 2-12 or as determined at the time of closure through consultation with the BLM and Nevada Division of Environmental Protection. This method has proven successful at BMM over the past several years on existing rock disposal areas.

In addition to the general description of the reclamation for the rock disposal areas, additional reclamation measures for the specific rock disposal areas include the following:

- The reclamation for the Saga, Bida, and Top rock disposal areas would include placement of adequate material at closure so the top of each rock disposal area would be "rounded" to promote surface run-off from the top of the rock disposal area.

- After final grading of the Saga and Bida rock disposal areas during reclamation, there would be six to 12 inches of growth media (depending on availability) placed on the rock disposal areas prior to seeding with the approved BLM seed mixture. This soil/vegetative cover would reduce the infiltration of meteoric water and enhance evapo-transpiration.

- The side slopes of the Saga, Bida, and Top rock disposal areas would be graded to a nominal 2.5 horizontal to 1 vertical. This change will reduce the residence time of water on the rock disposal area face and increase the run-off rate, further reducing the potential for infiltration.

- The engineering design for the drainage channel network for the Saga, Bida, and Top rock disposal areas would be modified to account for the slightly higher flow rates resulting from the steepening of the side slopes and to prevent erosion.

Heap Leach Pads

The heap leach facilities would be decommissioned in accordance with Nevada Division of Environmental Protection regulations and guidelines for closure. A Tentative Plan for Permanent Closure, as required by Nevada Administrative Code 445A.398, is already included within the current Water Pollution Control Permit applications for existing leach facilities. A Final Plan for Permanent Closure, to include proposed expansion components, would be prepared and submitted to Nevada Division of Environmental Protection and BLM two years prior to the termination of each heap leach facility operation, as per Nevada Administrative Code 445A.447. Final closure plans for both the 2/3 Heap Leach Pad and Mooney Basin Heap Leach Pad are anticipated to follow those of other pad closures already evaluated and successfully completed within the BMM district (Alligator Ridge, Yankee, Little Bald Mountain, and BMM Pad 1).

Chemical stabilization of heap leach pads is required to obtain permanent closure. Nevada Administrative Code 445A.379 defines *stabilized* as "the condition which results when contaminants in a material are bound or contained so as to prevent them from degrading the waters of the State under the environmental conditions that may reasonably be expected to exist at a site."

Geochemical investigations and empirical monitoring that have been conducted at the existing closed facilities such as Yankee and BMM Pad No. 1 (SRK, 2001; Geomega, 2000) indicate that there is no additional benefit in recirculation of process solution within the heap or rinsing with fresh water beyond the point in time where economic gold recovery is no longer achieved. Further, the evapo-concentration of salts and metals resulting from extended recirculation may slow chemical stabilization. Therefore, rinsing is not expected to be beneficial or required to stabilize the heaps associated with this ore type.

Following cessation of active leaching, solution from both currently active heap leach pads would be managed through recirculation and active evaporation until draindown from the pads can be managed long-term through the use of evapo-transpiration cells. Recirculation would occur until the existing process ponds have sufficient capacity to contain 24-hours of draindown from the leach pads. Active evaporation would be used to reduce the volume of process solution through the use of sprinklers, snow makers, or other devices. This active evaporation would occur until the volume of draindown is sufficient to be managed with the evapo-transpiration cells.

The heap leach pads would be constructed in lifts ranging in thickness of 10 to 30 feet (design benches of 25 feet), depending upon operational considerations. Heaps would be constructed in lifts set on a 3 Horizontal:1 Vertical balance line to ensure ease of final reclamation to a 3 Horizontal:1 Vertical slope. As with previous heap leach closures within the mining district, each bench would be regraded to the final configuration with overall slopes of 3 Horizontal:1 Vertical. When no longer required for evaporation of fluids, the surface solution circulation piping would be removed or buried within the leach facility, and the perimeter ditches would be filled with a protective layer and clean growth medium and/or barren rock. Side-slopes would then be regraded to match closely with the crest of the perimeter collection ditches in preparation for the placement of soil cover. The BMM leach pad closure studies (Brown and Caldwell, 1997, 1998, 2000; Geomega, 2000; SRK, 2001) indicate the benefit of placement of 18 to 36 inches of growth medium on the reclaimed heaps as this provides for a stable post-closure landform and reduces the infiltration of meteoric waters. A thicker cover on the heap leach pad as compared with other facilities (e.g., waste rock facilities) would allow retention of water in the cover material during snow melt and precipitation events and make this water readily available for uptake by plants. By retaining the water in the cover material, the amount of water infiltrating is reduced, thus minimizing the draindown solution that would be handled by the evapo-transpiration cells during closure and post-closure.

The recontoured heap leach pads would be covered with 24 inches of growth medium, which will act as an evapo-transpiration cover to reduce meteoric water infiltration into the heap leach pad. The depth of the evapo-transpiration cover is based on studies conducted to analyze infiltration at differing depths of cover (from 18 inches to 36 inches) (Brown and Caldwell, 1997, 1998, 2000; Geomega, 2000; SRK, 2001), and on information and past success at other closed facilities at this mine site. If future studies for any individual pad indicate a need for greater cover, this information would be provided to the Nevada Division of Environmental Protection and BLM, and the reclamation plan would be adjusted accordingly. Revegetation of the heaps would be carried out following growth medium placement.

Stormwater diversion structures would be constructed upgradient of the heaps to prevent impacts from stormwater run-on. These structures would not be reclaimed but would be retained to minimize erosion over the long-term.

As the heaps are stabilized and closed, the long-term heap drainage would be routed to evapo-transpiration cells or evaporation cells to further reduce or eliminate the discharge from the system. Long-term heap drainage refers to drainage from the heap leach pad after active evaporation is no longer needed to reduce the draindown and the draindown is solely managed through the evapo-transpiration or evaporation cells. This time period varies with each leach pad but typically ranges from several years to 20 years. The evapo-transpiration cells or evaporation cells are typically constructed by converting the existing solution ponds. Evapo-transpiration cells use plants to evapo-transpire solution while evaporation cells rely strictly on evaporation to eliminate draindown solution. Initial heap water balances and empirical evapo-transpiration cell data from other closed facilities at this site indicate that site evaporation and transpiration can be employed to result in zero-discharge stability at the site. Barrick proposes to pursue this long-term zero-discharge option as a primary goal for closure.

Site-specific data would be collected for each proposed heap and submitted as part of the Final Plan for Permanent Closure at least two years prior to the closure of each heap. Information from the site closure studies conducted for the five closed heaps within the mining district indicated no long-term potential to degrade waters of the State. Where data do not support the implementation of evapo-transportation cells or evaporation cells, alternative removal, use, or treatment of the fluids may be required. A final permanent closure plan would be developed with the Nevada Division of Environmental Protection.

Solution Ponds

Solids would be present in some quantity in most of the ponds at the time of closure. Representative samples would be obtained to determine the chemical characteristics of the pond solids. Depending on the results of the characterization testing, the solids would either be left in the ponds with the pond liners (liners would be folded over and buried in place), removed and placed on the heap prior to regrading and covering, removed and sold for metal recovery, or removed and placed in an approved landfill.

Where the ponds may be converted into a passive post-closure fluid management evapo-transpiration cell or evaporation cell, the liners would be inspected and repaired as necessary. The pond liners would be protected with a specified two-foot overliner layer or other suitable protective layer and then backfilled with alluvium with a fluid conveyance/distribution system. The surface would be graded to prevent accumulation of water and to blend with the surrounding topography. A growth medium cover of six to 12 inches would be placed over the resulting evapo-transpiration cell. Evaporation cells would be left open, if used (generally based on geochemical considerations and biological risk evaluation), resulting in a lined pond.

The liners for ponds not designated as part of the closure fluid management system would be cut, folded, and left in the pond bottoms prior to backfill and reclamation of the pond. The pond would be returned to a landform that is free-draining and supports post-closure revegetation through placement of an average of six to 12 inches of growth medium.

Roads

The Proposed Action area encompasses terrain from nearly flat to upwards of 30 percent slopes. Haul and access roads would be constructed in a wide variety of terrain within the Proposed Action area. Reclamation of roads in very steep terrain may not allow original topography to be attained. In this case, the cross-section would be blended to ensure no steeper than 2.5 Horizontal:1 Vertical slopes except where cut banks are on the inside of the road and located generally in bedrock. Those cuts in bedrock may remain as permanent features similar to a cliff or rock outcrop.

Within the Proposed Action area, roads and safety berms would be recontoured or regraded to the approximate original topography. Where the road is located on fill, the side slopes would be rounded and regraded to 3 Horizontal:1 Vertical. Finished slopes would be relatively similar to the surrounding topography. Compacted road surfaces would be ripped, covered with soil/growth medium from the safety berms or road fill if required, and revegetated. Dikes and ditches that would no longer be required would be regraded. Where the fill portion of the road would be largely removed, ripping would be performed only where the original roadbed would otherwise be left in place.

Some roads would be needed during closure activities to access monitoring points. Any remaining roads would be recontoured and revegetated when no longer needed.

Disposition of Structures, Equipment, and Materials

As stated in the current reclamation plan for existing facilities, during final mine closure buildings and structures would be dismantled and materials would be salvaged or moved to the site landfill or other appropriate disposal site. Concrete foundations and slabs would be broken up using a track-hoe mounted hydraulic hammer or similar methods and buried in place under approximately three feet of material in such a manner to prevent ponding and to allow vegetation growth. After demolition and salvage operations are complete, the disturbed areas would be covered with growth medium and revegetated.

Reagents and explosives would be removed for use as product at other mines, or appropriately disposed of off-site. Any surface pipelines would be removed, typically for salvage. Underground pipeline ends would be capped/plugged and left in place. Unneeded utility poles would be cut off at ground level and removed.

Drill Hole Plugging

All mineral exploration and development drill holes and monitoring, production, and dewatering wells that are subject to Nevada Division of Water Resources regulations would be abandoned in accordance with applicable rules and regulations (Nevada Administrative Codes 534.420 through 534.430). Boreholes would be sealed to prevent cross contamination between aquifers, and the required shallow seal would be placed to prevent contamination by surface access.

Monitoring wells associated with the processing facilities would be maintained until BMM is released of this requirement by the Nevada Division of Environmental Protection. These wells would then be plugged and abandoned according to the requirements of the Nevada State Engineer.

Post-Closure Monitoring
Monitoring of water quality, stability, and revegetation would occur in compliance with existing regulations, permits, and approvals. Monitoring for stability, focusing on erosion of reclaimed areas and stability of the pit high walls, would be conducted after completion of earthworks associated with reclamation. The monitoring would be conducted for a minimum of two years or in accordance with the reclamation permit. Monitoring of stormwater controls and stability would also be conducted as required under the Nevada General Stormwater Permit.

Revegetation monitoring would be conducted for a minimum of three years following completion of seeding of reclaimed areas. This monitoring would be conducted to determine if revegetation meets the requirements of the Attachment B, Nevada Guidelines for Successful Revegetation for the Nevada Division of Environmental Protection, the BLM, and the U.S. Department of Agriculture Forest Service (NDEP, 1998).

Water quality monitoring would be conducted in accordance with the Water Pollution Control Permit issued by the Nevada Division of Environmental Protection. Sampling locations and monitoring frequency are identified in this permit. Post-closure monitoring would continue for a minimum of five years following complete closure of the heap leach pads (draindown managed by the evapo-transpiration cells) and reclamation of waste rock areas. Existing and proposed water monitoring locations are shown on Figure 2-12.

2.4 Design Features (Applicant-Committed Environmental Protection Measures)

Design Features (Applicant-committed environmental protection measures) have been developed as a way of minimizing or avoiding environmental impacts. Table 2-13 provides the Design Features (applicant-committed environmental protection measures) that would be implemented by Barrick for the Proposed Action. They have been organized by the primary resource the protection measures would benefit or protect. Potential impacts are also provided. The operator would comply with performance standards in 43 CFR 3809.420 as well as appropriate BLM Best Management Practices found in Appendix D.

TABLE 2-13 DESIGN FEATURES (APPLICANT-COMMITTED ENVIRONMENTAL PROTECTION MEASURES)

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
Water Resources	• Erosion (water) • Impacts to groundwater	• Construct access roads to BLM road standards. • Close surface drill holes per Nevada Revised Statute 534. • Install erosion control berms, silt fence, straw bales, detention basins or other features as necessary in areas prone to erosion. • Install wells to monitor water quality
Geology and Minerals	• Removal of mineral resources	• Pits with remaining resources would not be backfilled
Paleontology	• Impacts to paleontological resources of scientific interest	• If paleontological resources of potential scientific interest are encountered (including all vertebrate fossils and deposits of petrified wood), leave them intact and immediately bring them to the attention of the BLM Authorized Officer.
Soils	• Soil erosion (wind and water)	• When preparing the site for reclamation, include appropriate Best Management Practices as determined appropriate for site-specific conditions. • Use existing roads as much as possible. • Store growth media in stockpiles. • Upon completion or temporary suspension of mining operations, backfill all holes and trenches and re-contour area to the approximate natural slope with slopes at 3 Horizontal to 1 Vertical or to the original topography, whichever is less. • If stockpiles would remain over a growing season, seed with interim seed mix.
Vegetation	• Loss of native vegetation	• Where seeding is required, use appropriate seed mixture and seeding techniques approved by the BLM Authorized Officer. • Reclaim with interim and final seed mixes. • Generally, conduct reclamation with native seeds that are representative of the indigenous species present in the adjacent habitat. Possible exceptions would include use of non-native species for a temporary cover crop to out-compete weeds. In all cases, ensure seed mixes are approved by the BLM Authorized Officer prior to planting. • Reclamation goals would be to satisfactorily reclaim disturbed areas in accordance with the approved reclamation plan. Disturbance would be recontoured to blend with the natural topography, erosion stabilized, and an acceptable vegetative cover established in accordance with Nevada Guidelines for Successful Revegetation prepared by the Nevada Division of Environmental Protection, the BLM, and the U.S. Department of Agriculture Forest Service. • Curl-leaf mountain mahogany (*Cercocarpus ledifolius* Nutt.), single-leaf pinyon pine (*Pinus monophylla*) and juniper (*Juniperus osteosperma)* trees would be removed only as necessary in proposed disturbance areas.
Non-Native Invasive Species	• Increasing weed infestation from existing local sources • Introduction of new weed infestations by importing new seed sources on equipment	• Barrick would continue to work with the BLM, the Tri-County Weed District, and the Newark Valley/Long Valley Cooperative Weed Management Area to prevent the spread of invasive, nonnative species in the area affected by the expansion. • Prior to project approval a site-specific weed survey would occur and a weed risk assessment would be completed. Monitoring would be conducted for a period no shorter than the life of the permit or until bond release and monitoring reports would be provided to the BLM. If the spread of noxious weeds is noted, appropriated weed control procedures would be determined in consultation with BLM personnel and would

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
	• Herbicide application • Inspection of source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials • Construction site management	be in compliance with BLM Handbook H-9011, H-9011-1 Chemical Pest Control, H-9014 Use of Biological Control Agents of Pests on Public Lands, and H-9015 Integrated Pest Management. Should chemical methods be approved, the lessee must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date. A pesticide Application Report must be submitted to the Authorized Officer by the end of the fiscal year follow chemical application. • Barrick would continue existing measures to survey for and treat noxious weeds. • Areas of concern would be identified and flagged in the field by a weed scientist or qualified biologist. The flagging would alert personnel or participants to avoid areas of concern. These sites would be recorded using global positioning systems or other BLM Ely District Office approved equipment and provided to the Field Office Weed Coordinator or designated contact person. • Segregate growth media that may contain noxious weed seeds away from growth media not containing noxious weed seeds. • The contractor, operator, or permit holder would provide information and training regarding noxious weed management and identification to all personnel who would be affiliated with the implementation and maintenance phases of the project. • To eliminate the transport of vehicle-borne weed seeds, roots, or rhizomes all vehicles used on the site would be free of soil and debris capable of transporting weed propagules. All such vehicles and equipment would be cleaned with power or high pressure equipment prior to entering or leaving the work site or project area. Vehicles used for emergency fire suppression would be cleaned as a part of check-in and demobilization procedures. Cleaning efforts would concentrate on tracks, feet and tires, and on the undercarriage. Vehicle cabs would be swept out and refuse would be disposed of in waste receptacles. Cleaning sites would be recorded using global positioning systems or other mutually acceptable equipment and provided to the BLM Ely District Office Weed Coordinator or designated contact person. • To eliminate the introduction of noxious weed seeds, roots, or rhizomes all interim and final seed mixes, hay, straw, hay/straw, or other organic products used for reclamation or stabilization activities, feed, bedding would be certified free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely District Office. • To eliminate the introduction of noxious weed seeds, roots, or rhizomes all source sites such as borrow pits, fill sources, or gravel pits used to supply inorganic materials used for construction, maintenance, or reclamation would be inspected and found to be free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely District Office. Inspections would be conducted by a weed scientist of qualified biologist. • Removal and disturbance of vegetation would be kept to a minimum through construction site management (e.g. using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.). • Reclamation would normally be accomplished with native seeds only. These would be representative of the indigenous species present in the adjacent habitat. Possible exceptions would include use of non-native species for a temporary cover crop to out-compete weeds. Where large acreages are burned by fires and seeding is required for erosion control, all native species could be cost prohibitive and/or unavailable. In all cases, seed mixes would be approved by the BLM Authorized Officer prior to application. • Mixing of herbicides and rinsing of herbicide containers and spray equipment would be conducted only in

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
		areas that are safe distance from environmentally sensitive areas and points of entry to bodies of water (storm drains, irrigation ditches, streams, lakes, or wells). • Methods used to accomplish weed objectives would consider seasonal distribution of large wildlife species. • No noxious weeds would be allowed on the site at the time of reclamation release. Any noxious weeds that become established would be controlled.
Wildlife	• Active raptor nests • Mule deer migration • Bat hibernacula	• Protect active raptor nests in undisturbed areas within 0.25 mile of areas proposed for vegetation conversion using species-specific protection measures. Inventory areas containing suitable nesting habitat for active raptor nests prior to the initiation of any project. • Consider seasonal distribution of large wildlife species when determining methods used to accomplish weed and insect control objectives. • Reclaim as soon as activities are complete. • Do not disturb bats while they are hibernating. • Gaps in haul road berms for ease of deer crossings
Migratory Birds	• Migratory bird nesting	• Conduct nesting surveys if disturbance needs to occur between April 15 and July 15. • Comply with Suggested Practices for Raptor Protection on Power Lines – The State of the Art in 2006 (Edison Electric Institute/Raptor Research Foundation).
Special Status Animal Species[1]	• Herbicides application in areas of special status species • Sage grouse leks • Utilities in sage grouse lek areas • Ferruginous hawk nests • Non-native invasive species control in special status species areas • Pygmy rabbits and pygmy rabbit habitat • Special status bat species	• When managing weeds in areas of special status species, carefully consider the impacts of the treatment on such species. Wherever possible, hand spraying of herbicides is preferred over other methods. • Avoid line-of-sight views between power line poles and sage grouse leks, whenever feasible. • Determine location of active sage grouse leks and avoid during strutting season. • Avoid ferruginous hawk nests. • Do not conduct noxious and invasive weed control within 0.5 mile of nesting and brood rearing areas for special status species during the nesting and brood rearing season. • Identify pygmy rabbit habitat, and avoid pygmy rabbits, if encountered. • Conduct bat surveys, where appropriate.
Wetlands	• Disruption of wetlands • Loss of spring recharge	• Avoidance of disturbance in wetlands (identified in Section 3.9.1). • Hydrology studies to determine potential impacts.
Range Resources	• Loss of forage	• Reclaim as soon as activities are complete.
Wild Horses	• Traffic around wild horses • Loss of forage	• If a project involves heavy or sustained traffic, require road signs for safety and protection of wild horses. • Reclaim as soon as activities are complete.
Land Use and Access	• Post-mining configuration of access roads	• BMM would establish post-mining access in conjunction with BLM travel management plan. • Traffic control measures would be used during operations.

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
	• Public safety	
Recreation	• Potential restriction of recreation use	Reclaim as soon as activities are complete.
Air Quality	• Fugitive dust from roads and loading/dumping • Exhaust emissions • Reduction of airborne fugitive dust • Fugitive dust during mining activities	• Use dust abatement techniques on unpaved, unvegetated surfaces to minimize airborne dust. • Conduct maintenance on equipment to ensure proper function. • Post and enforce speed limits (e.g., 25 miles per hour). • Use dust abatement techniques before and during surface clearing, excavation, or blasting activities. • Compliance with NDEP air permit.
Visual Resources	• Light pollution • Viewshed protection	• At industrial facilities authorized by the BLM Ely District Office, utilize anti-glare light fixtures to limit light pollution. • Reclaim as soon as activities are complete.
Cultural Resources	• Cultural resource protection	• Ensure that all activities associated with the undertaking, within 100 meters of the discovery, are halted and the discovery is appropriately protected, until the BLM authorized officer issues a Notice to Proceed. • BLM would determine level of inventory needed (Class I, II, or III, reconnaissance or none). • Prior to surface disturbing activities, inventories would be conducted by permitted archeologist for unsurveyed sites or those not evaluated within the past 10 years. • All historic properties and cultural resources would be avoided if possible. • If avoidance is not possible, develop treatment plan for the historic properties affected by the proposed disturbance. • Submit all cultural reports to the BLM. • The applicant would inform all persons associated with the project that knowingly disturbing cultural resources (historic or archaeological) or collecting artifacts is illegal. • Perform viewshed reclamation when the setting of a site contributes to the significance of the property.
Native American Religious Concerns	• Native American concerns	• BLM to consult with potentially affected Native American tribes.

RESOURCE	POTENTIAL IMPACTS	ACTIONS TO MINIMIZE OR AVOID IMPACTS
Hazardous and Solid Waste/Hazardous Materials	• Disposal of toxic and hazardous materials, and solid wastes • Herbicide applications • Accidental spills of hydrocarbons that could contaminate water, soil, and vegetation • Storage of hazardous materials • Handling of hazardous and solid wastes • Transporting hazardous materials • Potential of public mine site accidents	• Properly dispose of all tailings, dumps, and deleterious materials or substances. Take measures to isolate, control, and properly dispose of toxic and hazardous materials. • Remove and properly dispose of all trash, garbage, debris, and foreign matter. Maintain the disposal site and leave it in a clean and safe condition. Do not allow burning at the site without prior approval. • Prior to commencing any chemical control program, and on a daily basis for the duration of the project, the certified applicator would provide a suitable safety briefing to all personnel working with or in the vicinity of the herbicide application. This briefing would include safe handling, spill prevention, cleanup, and first aid procedures. • Do not drain oil or lubricants onto the ground surface. Immediately clean up any spills under 25 gallons; clean up spills over 25 gallons as soon as possible and report the incident to the BLM Authorized Officer and Nevada Division of Environmental Protection. • Containerize petroleum products such as gasoline, diesel fuel, and lubricants in approved containers. • Properly store hazardous materials in separate containers to prevent mixing, drainage, or accidents. • Clean up spills in accordance with Nevada Division of Environmental Protection guidelines • Follow BMM and contractor Standard Operating Procedures for handling hazardous and solid waste • Restrict public access locally during active mining.

[1]U.S. Fish and Wildlife Service Threatened, Endangered, Candidate, and Proposed Species; State Protected Species; BLM Sensitive Species

2.5 Alternatives to the Proposed Action

Several alternatives were identified during the scoping process and during preparation of this FEIS: partial or full pit backfill, less mining, underground mining, Mooney Basin Heap Leach Pad, putting in conveyors, off-site ore processing, and changing pit geometry. Three specific criteria were determined necessary for an alternative to be carried forward in the FEIS:

- Does the alternative meet the Purpose and Need?
- Is the alternative practical or feasible from a technical and economic standpoint and using common sense rather than simply desirable from the standpoint of the applicant? and
- Does the alternative provide an environmental benefit?

Based on these criteria, two action alternatives to the Proposed Action were identified through consultation with BLM, NDOW, and BMM with input taken from public scoping comments in addition to the No Action Alternative. These alternatives are intended to reduce or minimize potential impacts associated with the Proposed Action and be responsive to scoping issues. The three alternatives identified and discussed further in this FEIS include the No Action Alternative, Partial Backfill Alternative (Alternative A), and the Mooney Basin Heap Leach Pad Alternative (Alternative B). An alternatives matrix was used to determine action alternatives that met the criteria (Table 2-14). Alternatives considered, but eliminated from detailed analysis with the reasons for their elimination, are described in Section 2.6.

TABLE 2-14 ACTION ALTERNATIVES CONSIDERED IN THE ANALYSIS

ALTERNATIVES	MEETS PURPOSE & NEED	FEASIBLE	ENVIRONMENTAL BENEFIT	CARRIED FORWARD FOR ANALYSIS
Partial Backfill	Y	Y	Y	Y
Full Pit Backfill	N	N	Y	N
Less Mining	N	Y	Y	N
Underground Mining	Y	N	Y	N
Mooney Basin Heap Leach Pad	Y	Y	Y	Y
Conveyor Rather Than Haul Road	Y	Y	N	N
Hauling Ore for Off-site Processing	N	Y	N	N
Pit Geometry	N	Y	Y	N

2.5.1 No Action Alternative

Under the No Action Alternative, gold mining activities would continue under the current authorizations for the BMM and Mooney Basin Operations Area as established by the Record of Decision for the BMM EIS (BLM, 1995a) and subsequent Environmental Assessments. Activities associated with the Proposed Action would not occur. The two existing mine plan areas would not be joined into one Plan of Operations, and the expansion activities associated with the Proposed Action would not occur. Mineral resources in these areas of expansion would remain undeveloped. It is anticipated that activities currently authorized would be completed in 2009 for both BMM and Mooney Basin Operations Area.

2.5.2 Partial Backfill Alternative (Alternative A)

The Partial Backfill Alternative is a modification of the Proposed Action to partially backfill up to six open pits as described below; other features of the Proposed Action would remain as described above. The purpose is to reduce the footprint of the rock disposal areas by reducing the quantity of material they would contain. Table 2-15 provides the volumes of backfill for each pit and associated reduction in volume and surface disturbance for each rock disposal area. Figures 2-14, 2-15, and 2-16 show the reduction area in the rock disposal areas with this alternative. There would be a 434-acre reduction in the amount of disturbance compared to the Proposed Action, resulting in a total disturbance of 3,486 acres.

TABLE 2-15 ALTERNATIVE A – PARTIAL BACKFILL DETAILS

BACKFILL LOCATION	BACKFILL AMOUNT (MILLION TONS)	ROCK DISPOSAL AREA REDUCTION (MILLION TONS)	ROCK DISPOSAL AREA REDUCTION (ACRES)
East Bida Pit	6.6	9.8 (Saga)	35.6 (Saga)[1]
Belmont Pit 2	3.2		
North 1 Pit	25.4	63.4 (North 1, 2, 5)	280.2 (North 1, 2, 5)
RBM Pit	38.0		
Saga Pit Area 1	6.1	8.3 (Saga)	35.6 (Saga)[1]
Saga Pit Area 2	2.2		
Sage Flat Pit	117.5	117.5 (East Sage North and South, Sage Flat)	118.6 (East Sage North and South, Sage Flat)
Totals	**199**	**199**	**434[1]**

1 The total reduction of the Saga Rock Disposal Area is 35.6 acres, with backfill of east Bida Pit, Belmont Pit 2, and Sage Pit 1 and 2 all contributing to the reduction in the Saga Rock Disposal Area.

2.5.3 Mooney Basin Heap Leach Pad Alternative (Alternative B)

The Mooney Basin Heap Leach Pad Alternative would modify the Proposed Action by changing the design of the proposed Mooney Basin and BMM heap leach expansions in order to reduce the footprint of disturbance (Figures 2-17 and 2-18). Other features of the Proposed Action would remain as described above. In order to limit the footprint of the Mooney Basin heap leach facility, the BMM 2/3 heap leach facility design must be modified to accommodate the leach material produced in the Proposed Action. The total production of heap material for the Proposed Action is approximately 200 million tons.

Figure 2-18 shows the capacity and footprint of the currently proposed Mooney Basin heap leach facility in comparison with the redesigned facilities under this alternative with the subsequent capacity and footprint. This modification to the heap leach pad designs would result in a reduction of 96 acres to the Mooney Basin Heap Leach Pad and associated facilities. The reduction would be by removing a section of the proposed power line and reducing the size of the heap leach and process areas (Figures 2-14 and 2-18). The power line would be reduced by 8,106 (9 acres) feet for a total reduction of 105 acres. This alternative would result in an increase of approximately 14 acres of disturbance to the BMM 2/3 heap leach pad process facilities from what is currently authorized.

The reconfiguration of the BMM heap leach facility would also affect the placement of growth medium stockpiles, process facilities, and ponds. Additional surface disturbance is also incurred due to the establishment of ancillary disturbance between heaps, process facilities, and existing roads. Additional surface disturbance for the growth medium stockpiles would be 12.3 acres, and additional surface disturbance for ancillary and process facilities would be 19.7 acres. The overall disturbance increase to the BMM heap leach facility would be approximately 14 acres beyond what is currently authorized. The total disturbance under Alternative B would be 3,815 acres.

2.6 Alternatives Considered but Eliminated from Detailed Analysis

As discussed in Section 2.5, several alternatives were identified and proposed by BLM, NDOW, and BMM but were eliminated from further analysis, as indicated in Table 2-14. These included full backfill of pits, less mining, underground mining, installation of conveyors to transport ore, hauling ore for off-site processing, and altering pit configuration or geometry. Each of these alternatives was considered to determine if it met the criteria identified in Section 2.6. Table 2-14 lists each alternative that was considered and identifies whether the alternative met the criteria for carrying the alternatives forward in the analyses.

Full Pit Backfill

Complete backfill of all pits was considered but not deemed a viable alternative. While there would be similar environmental benefits as those discussed for the Partial Backfill Alternative, significant double handling of waste rock would be required, rendering the overall project economically infeasible as well as not meeting stated purpose and need. Additionally, complete pit backfill would significantly restrict or eliminate further mineral access in these areas, should different technologies or economic conditions develop in the future.

Less Mining

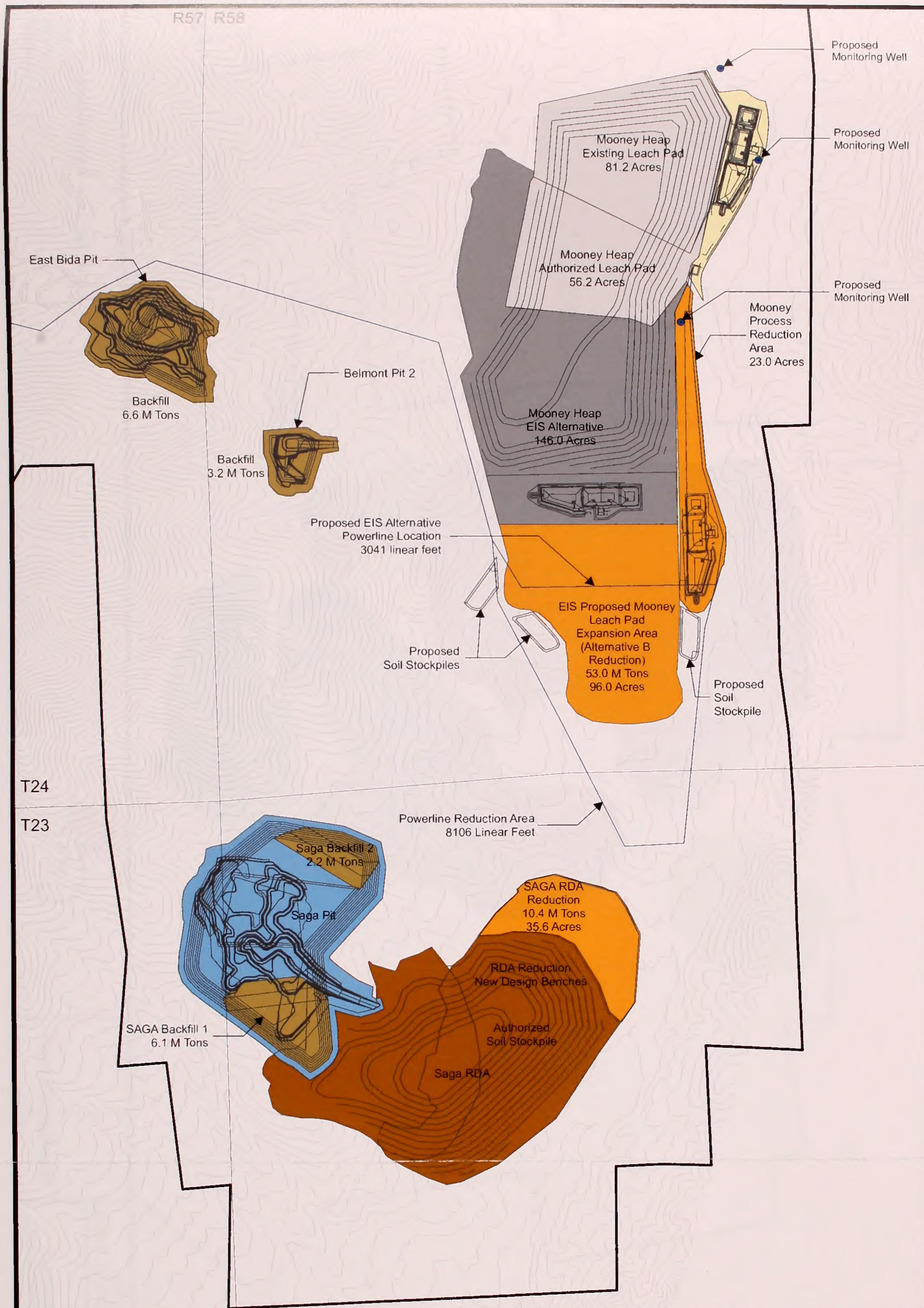
Less mining was determined not to meet the Purpose and Need statement of this EIS. The purpose of Barrick's Plan of Operations for the BMM North Operations Area Project is to expand mining opportunities at the BMM and Mooney Basin Operations Area, while consolidating these two mines into one new Plan of Operations called North Operations Area. The need is to continue to profitably recover gold resources from federal mining claims within the Proposed Action area. Because conducting less mining does not meet the Purpose and Need for this project, it was not carried forward in the analysis.

Underground Mining

Underground mining of the ore deposit was once believed to be feasible, as indicated with limited underground mining being previously approved by the BLM (BLM, 1995a). The original plan for underground mining was based on limited exploration drilling in the area at the time the decision was made. Underground mining of concentrated deposits would have extended the life of the mine for a short period. Since that time, BMM has conducted extensive additional drilling in the area and has determined that a larger, low-concentration dispersed deposit is present. Therefore, conducting underground mining is no longer considered feasible.

Conveyors to Transport Ore

A conveyor between the Top Pit and BMM processing facilities was mentioned in the 1995 EIS as a reasonably foreseeable, interrelated project. However, the conveyor was not part of the Proposed Action or alternatives that were analyzed or approved in that EIS. The use of conveyors (in lieu of haul roads) was determined to be feasible during scoping for this EIS. The discussion included whether the conveyor was a means and method best determined by the proponent or whether there was an environmental benefit to the use of conveyors over the use of haul roads. It was determined that disturbance associated with conveyors would be the same as or greater than the Proposed Action and therefore did not offer a benefit. It was also determined that the use of conveyors would still require a maintenance road to service the conveyor and existing roads could not be eliminated as they also served as transport avenues for workers and delivery of materials to various components of the Proposed Action. Vehicles would still need to be used with this operation to transport ore from open pits to the base of the conveyor for further transporting. In addition, conveyor systems are not designed to convey run-of-mine ore because of the size of the material. Barrick would need to install a crusher at a centralized location and haul material to the crusher prior to conveyance to the heap leach pad.



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

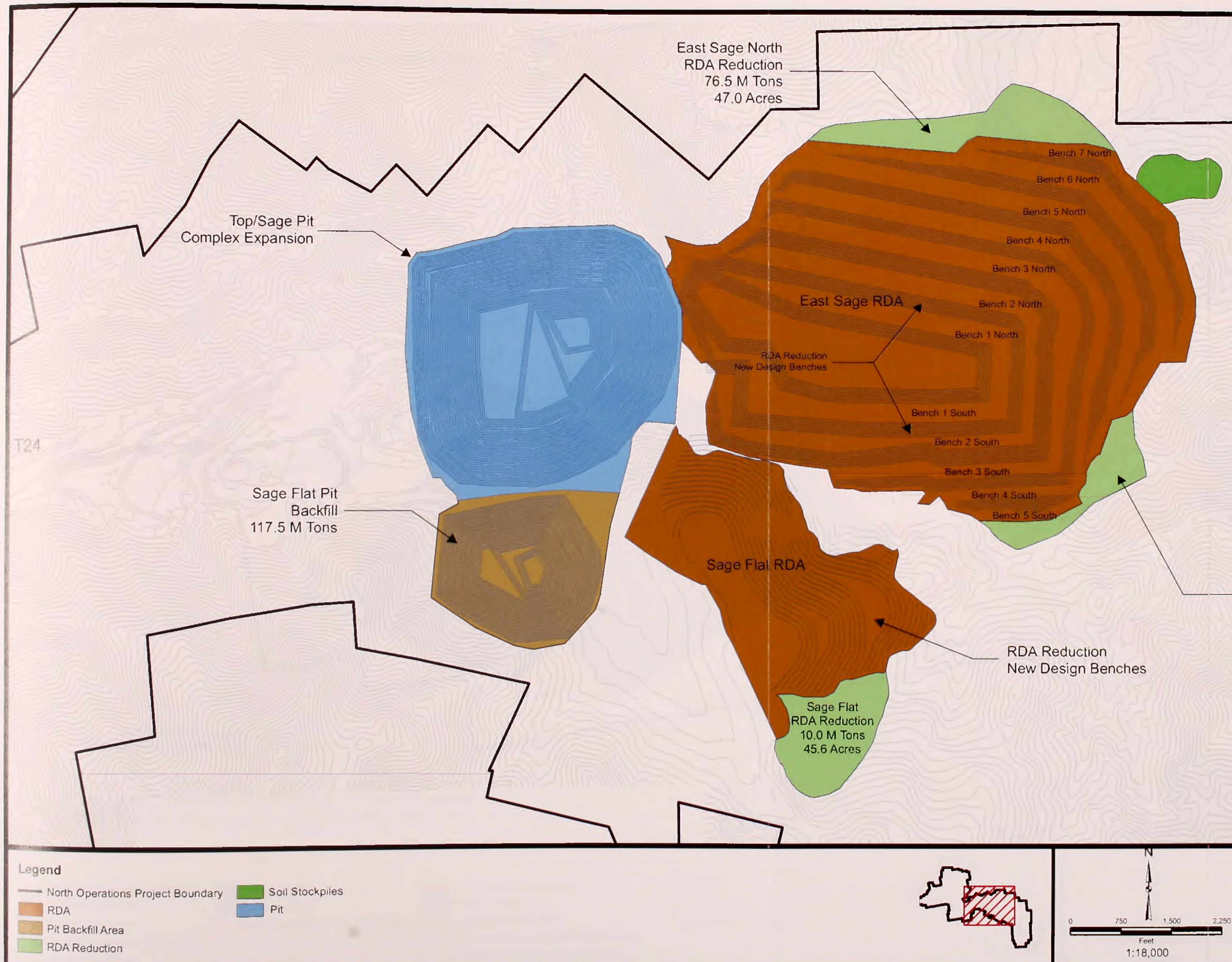
FIGURE 2-14
ALTERNATIVE A PART I
SAGA AND BELMONT
ALTERNATIVE B MOONEY
BASIN PAD REDUCTION*

*ALSO SEE FIGURES 2-17 AND 2-18

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

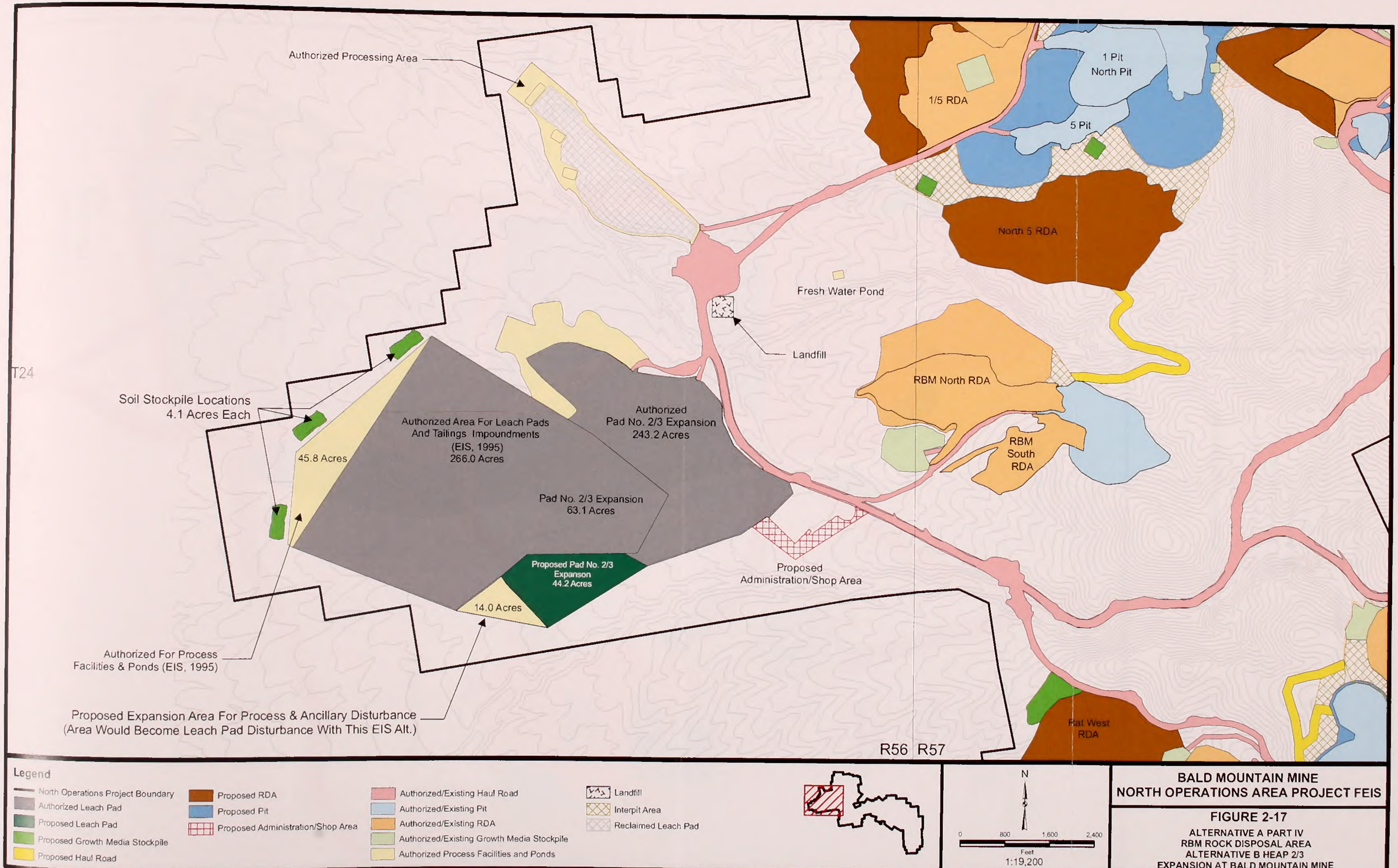
FIGURE 2-15

ALTERNATIVE A PART II NORTH AREA COMPLEX ROCK DISPOSAL AREA



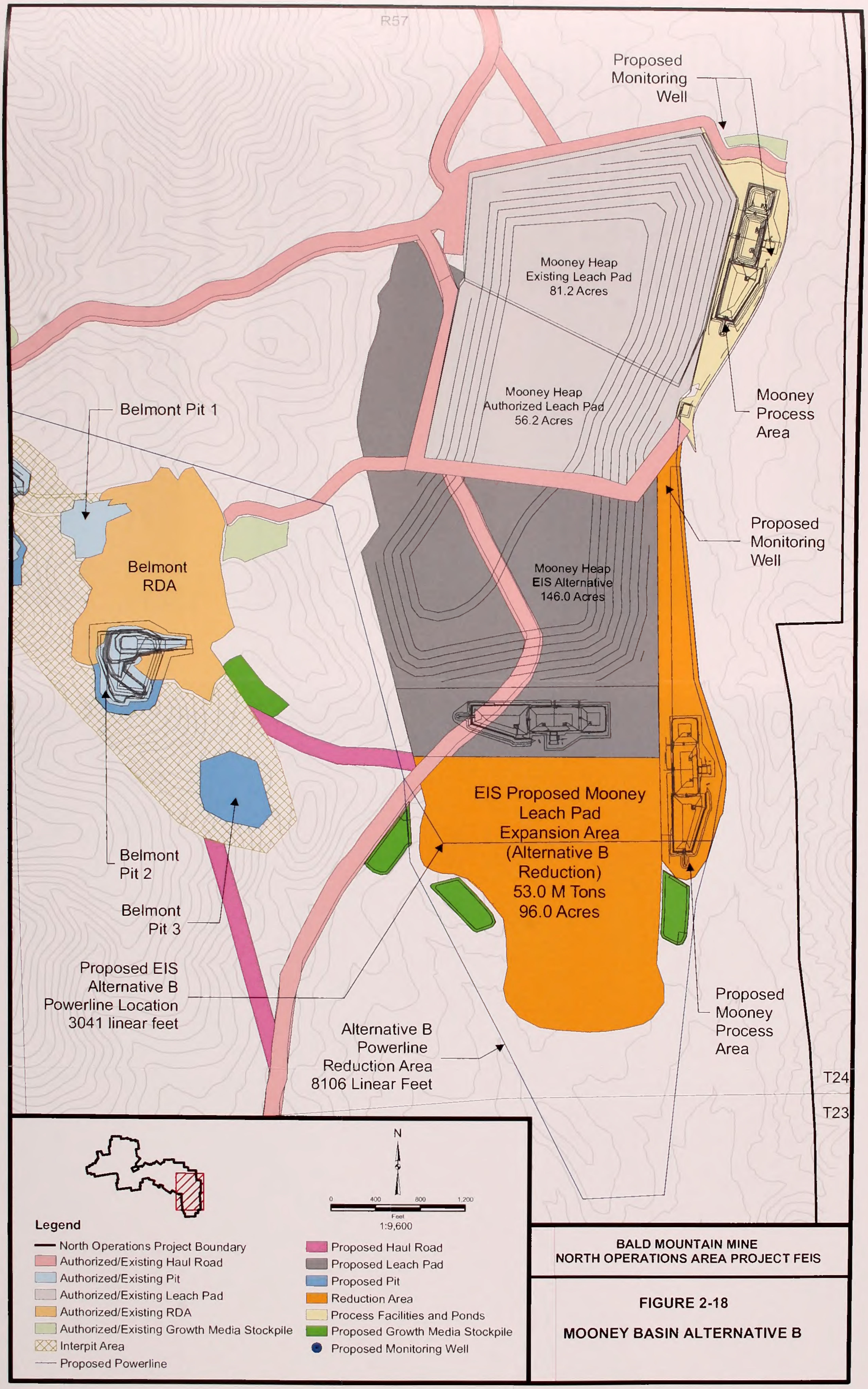
BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-16
ALTERNATIVE A PART III SAGE FLAT



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-17
ALTERNATIVE A PART IV
RBM ROCK DISPOSAL AREA
ALTERNATIVE B HEAP 2/3
EXPANSION AT BALD MOUNTAIN MINE



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 2-18

MOONEY BASIN ALTERNATIVE B

Installation of a crusher system would require a significant increase in electrical use and would increase fugitive emissions. Based on no perceived environmental benefit, potentially even greater environmental impacts (additional disturbance, fugitive emissions, and increase electrical power), and the continued use of mine vehicles, conveyors were not carried forward in the EIS for analysis.

Hauling Ore for Off-Site Processing

Hauling ore off-site was determined not to meet the Purpose and Need statement of this EIS. The purpose of Barrick's Plan of Operations for the BMM North Operations Area Project is to expand mining opportunities at the BMM and Mooney Basin Operations Area while consolidating these two mines into one new Plan of Operations called North Operations Area. The need is to continue to profitably recover gold resources from federal mining claims within the Proposed Action area. Barrick has other mines in northern Nevada that employ similar processing methods that could be utilized in the recovery of precious metals. The nearest Barrick operation potentially suitable for processing ore from the Proposed Action is the Ruby Hill Mine, west of Eureka. While an adequate public road network is in place that could be used to transport ore to Ruby Hill, the average grade of gold ore and haul costs over the approximately 70-mile distance to the processing site would not allow Barrick to meet the need to profitably recover gold resources. Because hauling ore off-site does not meet the Purpose and Need for this Proposed Action, it was not carried forward in the analysis.

Alternate Pit Geometry

Alternate pit geometry (steeper pit wall slopes with smaller pit footprints) was considered but determined to not be feasible or meet the purpose and need. Pit wall slopes are based on safety constraints and the need to access the ore reserve. Proposed pit designs will optimize recovery of the ore consistent with geotechnical and pit wall stability criteria. Steeper pit walls would not meet those criteria. Because alternate pit geometry would not be optimal, it does not meet the Purpose and Need for this Proposed Action and was not carried forward in the analysis.

2.7 Comparative Analysis of Alternatives

A comparison of the environmental impacts between the Proposed Action and the alternatives including the No Action Alternative was completed with a summary of the results provided in Table 2-16. This comparison of environmental impacts was based on implementation of the Design Features identified in Table 2-13 and BLM Best Management Practices provided in Appendix D. A detailed description of the environmental impacts for each resource is provided in Chapter 3.0.

2.8 BLM Preferred Alternative

The BLM's preferred alternative, based on the information from the scoping process and information contained within this FEIS, is the Partial Backfill Alternative as described in Section 2.5.2. The selection of this alternative is the one that the BLM believes best fulfills the agency's statutory requirements and responsibilities. The selection of this alternative takes into consideration environmental, economic, and technical factors.

The Partial Backfill Alternative (Alternative A) would have a reduction in the footprint of the rock disposal areas, return some of the open pits to pre-mining land use, and be economically feasible for the operator. There could be some risk of covering potential ore reserves, depending on future technologies and the price of gold. This would be minimized through careful exploration and planning by the operator. Pits not backfilled would either have potential future reserves or would not be economically feasible for backfilling.

Consideration was given to the Proposed Action and the other alternatives. The Proposed Action would have the same beneficial economic and social benefits associated with continued mining but would result in more disturbance and less land returned to post-mining land use than the Partial Backfill Alternative. Both the Proposed Action and the Mooney Basin Heap Leach Pad Alternative have less potential for reducing environmental impacts and surface disturbance. Under the No Action Alternative, there would be no additional surface disturbance, but the identified mineral resource would remain undeveloped and unrecovered. The economic and social benefits from continued mining would also not be met under the No Action Alternative. The BLM strives to achieve a balance between land use and resource protection, and this balance appears to be best reached with the Partial Backfill Alternative.

TABLE 2-16 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND OTHER ALTERNATIVES

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
Water Resources (Surface Water)	Increase in sedimentation and erosion	Disturbance of area and creation of waste rock dumps may lead to increased sedimentation in ephemeral drainages.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Water quality impacts from rock disposal areas or other facilities	No water quality impacts are anticipated as a result of drainage from the waste rock or other sources.	No anticipated impacts to water quality are anticipated because of smaller footprint of waste rock facility and no anticipated impacts to water quality.	Same as Proposed Action.	No impacts other than those already authorized.
	Reduction in spring recharge	Waste rock placed in the Cherry Creek recharge area may reduce or delay recharge to the local aquifer.	The reduction of the size of the Sage Flat RDA would result in less waste rock within the Cherry Spring recharge area, thus reducing the potential impact	Same as Proposed Action.	No impacts other than those already authorized.
	Fuel or chemical spills to drainages	Appropriate handling procedures would be used to minimize the risk of chemical spills during transporting and loading/unloading and discharging to drainages.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Water Resources (Groundwater)	Increase groundwater withdrawal by approximately 250 acre-feet per year	No impacts are anticipated from greater groundwater usage as there are no other users within the anticipated cone of depression.	Same as Proposed Action.	Less water needs at Mooney Basin but greater water needs at BMM. The total groundwater withdraw would be the same as the Proposed Action as the same amount of ore would be processed. No impacts to current users of the alluvial aquifer are anticipated.	No impacts other than those already authorized.
	Intersection of local groundwater by open pits	Local saturated zones may be intercepted but the deeper bedrock aquifer would not be intercepted by the pits. Water encountered from isolated saturated material during excavation would be handled as per the Water Pollution Control Permit.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Changes in groundwater quality	Heap leach pads and process ponds would be double-lined and operated in accordance with the Water Pollution Control Permit thus minimizing the risk of process solution impacting groundwater.	Same as Proposed Action.	Smaller pad at the Mooney Basin but larger pad at BMM, however, there would be no anticipated impacts to groundwater quality.	No impacts other than those already authorized.
Water Resources (Drinking Water)	Additional use of groundwater as a drinking water source	Installation of a treatment system for use of groundwater as a drinking water source. Would not significantly increase the consumption of groundwater.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Geology and Minerals	Ore extraction and waste rock placement	Removal of approximately 200 million tons of ore and 830 million tons of waste rock. Expansion of two heap leach facilities with the 200 million tons of ore.	Total tonnage of material mined would remain the same as Proposed Action, but the location of disposal, rock disposal area, and backfill is the only difference from the Proposed Acton.	Same as Proposed Action. The only difference would be the location where the ore is processed.	No impacts other than those already authorized.
	Limitation on the future availability of mineral resources	No impacts identified.	Backfill of several of the pits is not expected to impact any future precious metal resources as they will be fully explored prior to completing backfill activities	Same as Proposed Action	No impacts other than those already authorized.
Paleontology	Loss of paleontological resources	No paleontological resources within the project area appear to have scientific or educational value	Same as Proposed Action	Same as Proposed Action	No impacts other than those already authorized.
Soils	Loss of productive topsoil in disturbed areas (soil development and biological activity)	Approximately 3,920 acres of soils representing 16 soil associations would be permanently disturbed. Between 7.3 and 11.7 million cubic yards of soil would be salvaged and used during reclamation.	Impacts would be the same as Proposed Action, but approximately 434 less acres of disturbance would occur.	Impacts would be the same as Proposed Action, but approximately 105 less acres of disturbance would occur.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Increased soil erosion due to wind and water resulting in off-site deposition	Environmental controls including use of proper Best Management Practices for erosion and dust control would minimize impacts associated with erosion and off-site deposition.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Contamination of soil from chemical spills	Continued adherence to chemical handling practices would minimize the risk of chemical spills. Emergency response procedures and Spill Contingency Plan would be followed for notification and cleanup procedures.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
Vegetation	Removal of vegetation	Approximately 3,920 acres of vegetation would be removed during construction and operation of the Proposed Action. Of the 3,920 acres to be disturbed, approximately 540 acres of vegetation would be permanently removed as a result of pit expansion. Reclamation of the remainder of the disturbed acreage would result in established suitable vegetation for post-mining land use.	Impacts associated with this alternative would be similar however, removal of 434 acres less vegetation than the Proposed Action.	Impacts associated with this alternative would be similar however, removal of 105 acres less vegetation than the Proposed Action.	No impacts other than those already authorized.
	Increase in vegetation diversity following reclamation	Reclamation of the disturbed areas to a grass and shrub community would increase the diversity of the vegetation communities resulting in better forage.	Same as Proposed Action, but for a smaller area.	Same as the Proposed Action, but for a smaller area.	No removal of vegetation other than what was previously authorized.
	Increased potential for establishment of non-native species	Removal of vegetation will allow non-native species to become established. Control of non-native species through a weed management program will minimize this risk.	Same as Proposed Action with fewer acres of disturbance.	Same as Proposed Action with few acres of disturbance.	No additional impacts would occur.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Short-term loss of forage for wildlife and livestock	Approximately 3,920 acres of vegetation will be lost for available forage for wildlife and livestock. Reclamation would restore all but 540 acres of the forage that is currently available.	Same as Proposed Action with fewer acres of disturbance.	Same as Proposed Action with few acres of disturbance.	No additional impacts would occur.
	Increased potential for soil erosion in disturbed areas	Approximately 3,920 acres of disturbance would occur, thus increasing the risk of soil erosion in these areas. Best Management Practices for controlling erosion will be implemented to minimize soil loss.	Same as Proposed Action.	Same as Proposed Action.	No additional impacts would occur.
Non-Native Invasive Species	Establishment of non-native and Invasive species in disturbed areas as a result of vegetation removal	With the disturbance of 3,920 acres, the potential of non-native invasive, and/or noxious weed establishment will increase. Appropriate control measures including spraying and seeding will minimize the establishment of these species.	Same as the Proposed Action, but 435 less acres of disturbance.	Same as the Proposed Action, but 105 less acres of disturbance.	No impacts other than those already authorized.
Wildlife (Including Migratory Birds)	Interference with deer migration and mortalities due to increased traffic	Potential to interfere with north-south deer migration during winter months due to disturbance such as road and other potential barriers. Deer mortalities have been extremely low over the past 12 years. Mitigation, such as gaps in berms would minimize the impacts.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Loss of deer habitat including winter range	Approximately 219 acres of mountain brush habitat (preferred deer habitat) would be removed. Additional winter range habitat would be lost along the flanks of the mountain range in the Mooney Basin area.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Conversion of habitat	Approximately 1,712 acres of pinyon juniper habitat would be converted to grass and shrub habitat. This would likely benefit wildlife, especially grazing and browsing by providing good forage. In addition pit highwalls would be habitat roosting bats and for nesting raptors. Other existing habitats (big sagebrush and mountain brush) would be restored through reclamation.	Approximately 1,522 acres of pinyon-juniper habitat would be converted to grass and shrub habitat. This would likely benefit wildlife, especially grazer, by providing good forage.	Approximately 1,652 acres of pinyon juniper habitat would be converted to grass and shrub habitat. This would likely benefit wildlife, especially grazers, by providing good forage.	No impacts other than those already authorized.
	Mortalities due to land clearing activity, increased traffic and chemical exposure	Small less mobile animals would likely be destroyed during land clearing activities. Increased risks of wildlife injury or mortality by collisions with vehicles as a result of an increase in traffic on mine access roads. Cyanide and other chemicals used on site could result in wildlife mortalities. Environmental controls such as fencing and floating HDPE balls are designed to prevent access to chemical laden waters.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Displacement from existing habitat	Displacement of wildlife into adjacent undisturbed area could increase competition for resources resulting in higher mortality for some species.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
	Migratory birds - loss of habitat, displacement from human activity, potential nest and young destruction	Reduction of pinyon-juniper habitat would alter local bird species composition. Disturbance of vegetation during the bird breeding season could result in destruction of nest and young birds. Environmental controls including performing land – clearing activities outside of the avian breeding season (April 15 to July 15) and conducting bird nesting surveys prior to disturbance during avian breeding season would minimize the potential loss of nests and young.	Same as proposed action, with a reduction of approximately 434 acres of disturbance.	Same as Proposed Action, with a reduction of approximately 105 acres of disturbance.	No impacts other than those already authorized.
Wetlands, Riparian Zones, Waters of the U.S.	Disturbance and Destruction to isolated wetlands	All wetlands would be avoided by design.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Increase in sedimentation from erosion	Appropriate Best Management Practices for erosion control would be implemented to minimize water and wind erosion, resulting in sedimentation to isolated wetlands.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Alteration of Cherry Spring recharge area	A portion of the Cherry Spring recharge area would be covered with a waste rock disposal area. This could potentially reduce or slow recharge to the spring. Cherry Spring over the recent past as had no or very limited flow.	A significant reduction in the size of the Sage Flat Rock Disposal Area of within the Cherry Spring recharge area would occur reducing the potential impact to the recharge area.	Same as Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
Range	Loss of forage during operation and improved forage after reclamation	Short-term loss of approximately 98 animal unit months with removal of 3,920 acres of vegetation and a permanent loss of 98 animal unit months associated with pit disturbance. Reclamation would convert approximately 1,712 acres of pinyon juniper habitat to grass and shrub habitat providing additional forage.	Short-term loss of 87 animal unit months and the same permanent loss of animal unit months as the Proposed Action.	Short-term loss of 95 animal unit months and the same permanent loss of animal unit months as the Proposed Action.	No impacts other than those already authorized.
	Restricted Access	At a minimum, an additional 3,920 acres of land would be temporarily restricted from livestock access as a result of expansion of the Plan of Operations boundary. An additional 540 acres (expanded area of pits) of public land would be removed permanently from livestock access.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Wild Horses	Vehicle collisions, human disturbance	Short-term potential for vehicle collisions and avoidance of active mining areas.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Loss of forage during operation, improved forage after reclamation, and displacement	Short-term loss of approximately 3,920 acres of vegetation and a permanent loss of 540 acres of vegetation associated with pit disturbance. Reclamation would convert approximately 1,712 acres of pinyon juniper habitat to grass and shrub habitat providing additional forage.	Same as Proposed Action with a reduction of approximately 434 acres of disturbance..	Same as Proposed Action with a reduction of approximately 105 acres of disturbance.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
Land Use and Access	Restricted access	At a minimum, an additional 3,738 acres of land would be temporarily restricted from public access as a result of expansion of the Plan of Operations boundary. An additional 540 acres (expanded area of pits) of public land would be removed permanently from public access.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Conflicts with existing land use authorizations	Conflicts with existing land use authorizations would be negotiated with the owner of holder of that land use authorization.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Increased traffic	The increase in traffic is anticipated to be minimal as only one additional bus is expected to be put into use.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
Recreation	Restricted public access	At a minimum, an additional 3,738 acres of land would be temporarily restricted from public access and recreation activity such as hunting, trapping, hiking, etc. as a result of expansion of the Plan of Operations boundary.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
Air Quality	Impacts to air quality	Increase in air emissions from mobile sources and fugitive dust during construction of the facilities. This would be a slight increase over existing operations due to the additional equipment used during the construction period. All other emission would be similar to current operations. Mercury emissions are expected to decrease by 75 percent with the installation of	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
		mercury emission controls installed in 2008 and 2009.			
Visual	VRM Objectives (changes in line, form, color, and texture)	High contrast with surrounding undisturbed areas would result in objectives of the Visual Resource Measurements not being met during operation but with successful reclamation, Visual Resource Measurement objectives would be met.	Slight changes in disturbance from the Key Observations Points but result in the same conclusion as the Proposed Action.	Slight changes in disturbance from the Key Observations Points but result in the same conclusion as the Proposed Action.	No impacts other than those already authorized.
Noise and Vibration	Increase in noise	The level of mining activity would increase slightly but no significant increase in noise levels is expected over the current noise level with the existing operation. A slight increase in traffic along the access route may slightly increase the noise level in those areas.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
Socioeconomics	Work force increase	There would be an increase of approximately 110 employees at the mine which modeling indicates could result in an additional 33 indirect and 50 induced jobs. These would be divided between the three counties.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Labor Income	Modeling estimates that the value of direct, indirect, and induced annual labor income would be $9.9 million in 2006 dollars.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Increased demand on county and city infrastructure	Housing limitations in Ely and Eureka would like result in new employees finding housing in Elko. This trend may shift in the long-term as additional housing is constructed in the other	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
		communities. If all the new employees were to find housing in Elko, this would only represent 0.4 percent of the current civilian labor force. It is anticipated that the existing city and county infrastructure (schools, utilities, fire protection, law enforcement, etc.) would be adequate.			
Environmental Justice	Impact on minority or low income populations	None identified.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
	Undue burden to children	None identified.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Cultural Resources (Prehistoric)	Site disturbance	Seven prehistoric period archaeological sites have been identified as eligible for the National Register of Historic Places. Approximately 503 acres of the Proposed Action Area has not been surveyed. Any eligible sites that would be impacted by the Proposed Action would be handled in accordance with the programmatic agreement between Barrick, the BLM, and the State Historic Preservation Office.	With the reduction in disturbance, three non-eligible sites would be eliminated from potential impacts. Sites impacted by Alternative A would be in accordance with the programmatic agreement.	With the reduction in disturbance, one eligible site and two identified non eligible site would be outside the disturbance footprint, and one site that has not yet been evaluated. Sites impacted by Alternative B would be treated in accordance to the programmatic agreement.	No impacts other than those already authorized.
Cultural Resources (Historic)	Site disturbance	Twenty-nine historic period archeological sites have been identified with only one site deemed eligible for the National Register of Historic Places. Only one non-eligible site has been disturbed to date. Any eligible sites that would be impacted would be treated in accordance with the Programmatic Agreement.	With the reduction in disturbance, two non-eligible sites would be outside of the proposed disturbance footprint. Sites impacted by Alternative A would be treated in accordance with the programmatic agreement.	No non-eligible nor eligible historic sites are located in the reduced disturbance area associated with Mooney Leach Pad, thus impacts would be the same as the Proposed Action.	No impacts other than those already authorized.

RESOURCE	POTENTIAL IMPACT	PROPOSED ACTION	ALTERNATIVE A PARTIAL PIT BACKFILL	ALTERNATIVE B MOONEY BASIN LEACH PAD	NO ACTION ALTERNATIVE
Native American Religious Concerns	None Identified	None identified.	Same as Proposed Action.	Same as Proposed Action.	No impacts other than those already authorized.
Hazardous and Solid Waste/Hazardous Materials	Spills during transportation	Chemical spills during transportation could occur but the probability of a spill is expected to be very low. The probability of a spill in a sensitive area such as a population center or ecologically sensitive area is extremely low and not anticipated.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.
	Spills during storage or use	Some spills of chemicals and fuel could occur during operations. Handling, storage and use of chemicals and fuels would be conducted in accordance with the Hazardous Materials Spill and Emergency Response Plan, which would ensure the impacts from spills would be minimized and the spilled material contained and removed.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts other than those already authorized.

Chapter 3
Affected Environment and Environmental Consequences

3.1 Introduction

This chapter combines descriptions of the environment that would be affected and discussions of the anticipated direct and indirect impacts of the Proposed Action, the No Action Alternative, and two action alternatives. Cumulative effects are discussed in Chapter 4. The two action alternatives include the Partial Backfill Alternative (i.e., up to six open pits) and the modified Mooney Basin Heap Leach Pad Alternative. The baseline information summarized in this chapter was obtained from published and unpublished materials; interviews with local, state, and federal agencies; and field and laboratory studies conducted in the Proposed Action area. The affected environment for individual resources was delineated based on the area of potential direct and indirect environmental impacts for the Proposed Action.

The analysis of potential impacts from the Proposed Action includes implementation of appropriate Best Management Practices developed by the BLM (Appendix D) and Design Features selected by Barrick (Table 2-13), which include many of BLM's Best Management Practices. The Design Features are part of the Proposed Action and were specifically selected in response to potential impacts for individual resources and are applicant committed environmental protection measures. The terms effects and impacts are used synonymous. This chapter also identifies any residual adverse impacts, which are impacts that would remain after mitigation measures have been implemented. "Short-term" is defined as the life of the Proposed Action through closure and reclamation (2020). "Long-term" is defined as the future beyond reclamation.

3.1.1 Supplemental Authorities

Nevada Instruction Memorandum 2009-30 Supplemental Authorities to Consider in National Environmental Policy Act Documents encourages the consideration of the following due to requirements specified in statute, regulation, or executive order:

- Air Quality
- Areas of Critical Environmental Concern
- Cultural Resources
- Farm Lands (Prime or Unique)
- Forests
- Environmental Justice
- Floodplains
- Non-Native, Invasive Species
- Migratory Birds
- Native American Religious Concerns
- Federally Listed Threatened, Endangered and Proposed Species
- Hazardous and Solid Wastes/Hazardous Material
- Water Quality Surface-Ground
- Wetlands and Riparian Zones
- Wild and Scenic Rivers
- Wilderness

Of the Supplemental Authorities listed above, the following are not present or not expected to be directly or indirectly impacted by the Proposed Action or alternatives and are therefore not affected by the Proposed Action or alternatives as described in this FEIS. Therefore, analyses of these resources are not carried forward in this FEIS:

- Floodplains
- Farm Lands (Prime and Unique)
- Areas of Critical Environmental Concern
- Wild and Scenic Rivers
- Wilderness

The remainder of the Supplemental Authorities are considered in this FEIS and described and analyzed further in the following sections.

3.1.2 Other Resources and Uses

In addition to the Supplemental Authorities of the human environment, the BLM considers other resources and uses that occur on public lands and the issues that may result from the implementation of the Proposed Action or alternatives. The potential resources and uses or non-critical elements that may be affected are as follows:

- Geology and Minerals
- Paleontology
- Soils
- Vegetation
- Wildlife
- Sensitive Species
- Range Resources
- Wild Horses
- Land Use and Access
- Recreation
- Visual Resources
- Noise and Vibration
- Socioeconomics

These non-critical elements that are considered in this FEIS are described and analyzed further in the following sections.

3.1.3 Potentially Affected Supplemental Authorities and Other Resources

Based on the review of existing baseline data and surveys conducted in preparation of this FEIS, BLM specialists have identified the following supplemental elements and other resources as potentially affected. This is the combined list from Sections 3.1.1 and 3.1.2 and the order in which they will be presented in this document.

- Water Resources (Water Quality and Rights)
- Geology and Minerals
- Paleontology
- Soils
- Vegetation
- Non-Native Invasive Species
- Special Status Species (Federally Listed Threatened, Endangered, Proposed, and Sensitive)
- Wildlife
- Migratory Birds
- Wetlands and Riparian Zones

- Range Resources
- Wild Horses
- Land Use and Access
- Recreation
- Air Quality
- Visual Resources
- Noise and Vibration
- Socioeconomics
- Environmental Justice
- Cultural Resources
- Native American Religious Concerns
- Hazardous and Solid Waste/Hazardous Materials

3.1.4 Assumptions for Analysis

The following general assumptions apply to all resources included in the analysis:

- Earth-moving activities would take place 24 hours a day, 365 days a year.

- Waste rock that would be encountered under the Proposed Action is similar to waste rock currently being mined.

- Baseline studies fully and accurately depict conditions in the Proposed Action area.

- For the purposes of this analysis and under federal regulations, "impacts" and "effects" are assumed to have the same meaning and are interchangeable.

- It is assumed that unpaved road travel for employee and delivery truck travel is 40 miles per day one way (80 miles round trip per day).

If applicable, other resource assumptions will be included at the beginning of each resource section. If none are included, the general assumptions apply.

3.2 Water Resources

The water resources study area associated with the proposed BMM North Operations Area Project includes portions of four hydrographic basins: Newark Valley, Long Valley, Huntington Valley, and Ruby Valley (Figure 3-1). Huntington Valley is the only valley that is not considered a topographically closed basin. Surface water from Huntington Valley flows north into the Humboldt River.

Surface water in the Proposed Action area consists primarily of ephemeral drainages and isolated springs. A survey of the drainages in the Proposed Action area did not identify any drainages that have a defined channel connection or significant connection to known waters of the U.S. The survey has been submitted to the U.S. Army Corps of Engineers for concurrence and approval. There typically is minimal surface water in the Proposed Action area. When year-round water is observed, it typically is confined to small seeps or springs and does not occur as stream flow.

The local groundwater system consists of two primary components: (1) a deep regional bedrock-hosted system with groundwater present in fractures and in localized perched water within clay layers and (2) a sediment-based system comprising valley-fill alluvial material. The following sections discuss the surface and groundwater characteristics, including quantity and quality, as well as any anticipated impacts on the water resources due to the Proposed Action and alternatives.

3.2.1 Surface Water Affected Environment

There are few surface water resources within the Plan of Operations boundary. Surface water within the Proposed Action area is limited to isolated springs and ephemeral drainages that flow in response to storm events and spring runoff. Figure 3-2 shows the locations of seeps and springs in and around the Proposed Action area. Post-mining topography demonstrating proposed surface drainages within the Proposed Action area is provided in the BMM North Operations Area Project Plan of Operations (BMM, 2009).

Assumptions for Analysis

Assumptions made for the surface water analysis include the following:

- There are no springs within the Proposed Action area other than the springs identified by Simon Hydro-Search (1994b) and Tetra Tech (2007).

- Water sources would be avoided by design.

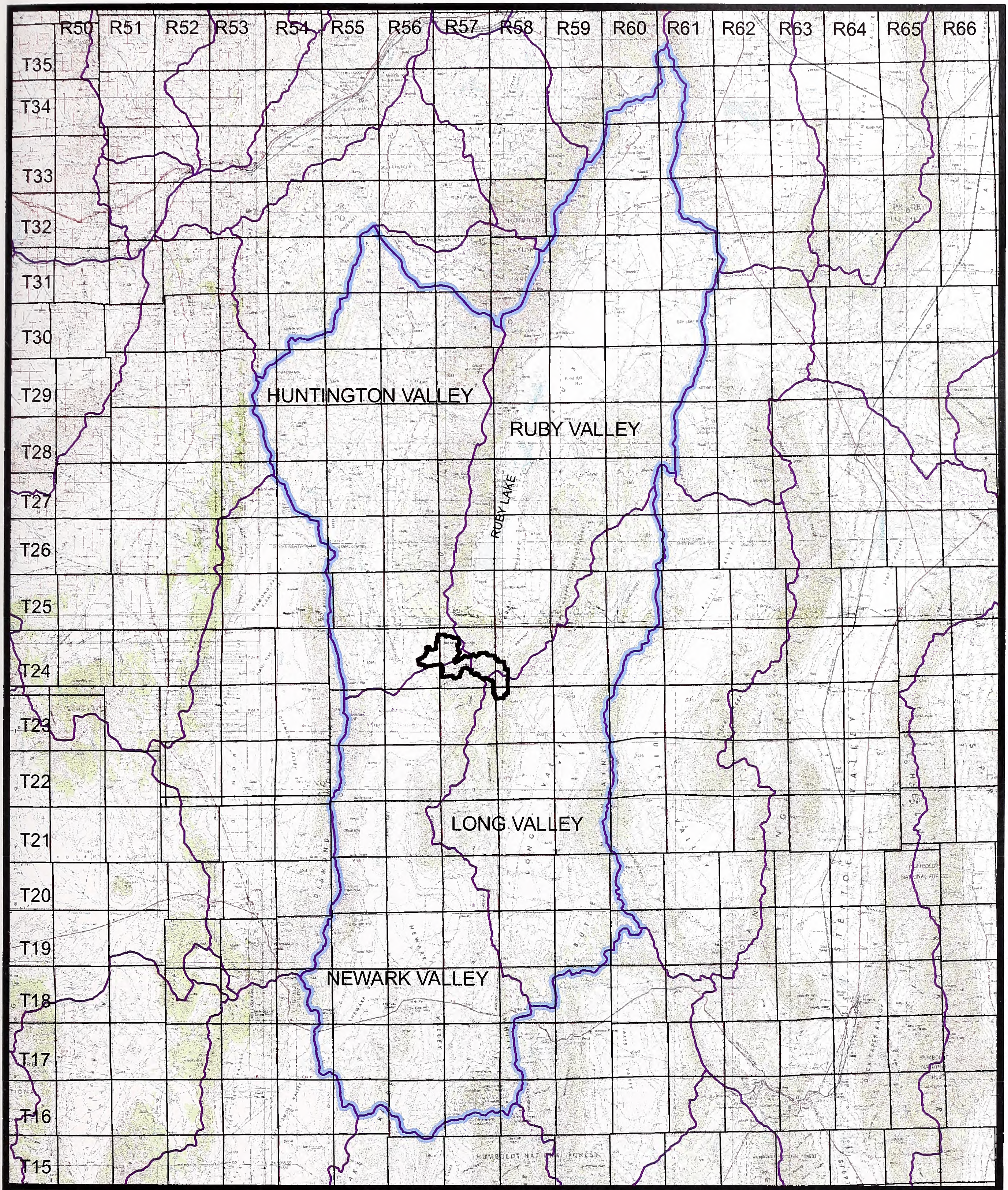
Surface Water Quantity

Surface water is limited due to low precipitation (9 to 14 inches per year at lower elevations and up to 21 inches per year at higher elevations) and high evaporation (approximately 51 inches per year) (WRCC, 2007). Spring runoff contributes to the flow in ephemeral drainages and provides water that infiltrates through faults and fractures to the bedrock system or isolated perched water confined by clay lenses. Some of this flow is then expressed at the surface as isolated springs, which is confirmed through mapping of the potentiometric surface (Mine Mappers, 2007). Flow rates from springs in the area were measured by Simon Hydro-Search (1994a) and supplemented by Tetra Tech (2007). Most drainage channels are dry for the majority of the year, except during spring runoff and significant storm events. Flow rates in the drainages within and near the Proposed Action area have not been measured because of the ephemeral nature of the drainages.

Springs in and near the Proposed Action area are typically found near the uppermost reaches of canyons or in the bottoms of canyons that are above 6,200 feet in elevation. Local springs include upper and lower Mill Spring, South Water Canyon Spring, Cherry Spring, and Bourne Tunnel Spring. Most springs are dry by summer; however, the Cracker Johnson #1 and #2 springs, which lie north of the Proposed Action area, and the South Water Canyon Spring typically flow until late summer or early fall. Flow in these springs averages between one and six gallons per minute (Table 3-1). There are no springs in the northern portions of Mooney Basin. There are three springs located east of the Proposed Action in the Maverick Springs Range (Willow Springs, Twin Springs, and Tognini Spring). These springs flow primarily during the spring, with recorded flows ranging from six gallons per minute at Tognini Spring to large wet spots observed at Twin Springs that could not be sampled (Table 3-1).

Surface Water Quality

The chemical quality of the baseline surface water flow is dependent upon the quality of the water being emitted from the springs, which is in turn dependent upon the chemistry of the rocks through which the water has infiltrated. The surface water chemistry is also dependent upon rainfall chemistry and erosion of soils. Simon Hydro-Search (1994b) categorized the springs in the area as perched, local, or regional, depending on the length of the flow path from the infiltration point to the point where the spring reaches the surface (i.e., daylights). There are five main rock types that contribute to the composition of the surface water chemistry in the



Legend

- North Operations Project Boundary
- Hydrographic Basin Boundaries
- Water Cumulative Assessment Study Area Boundary

N

0 40,000 80,000
Feet
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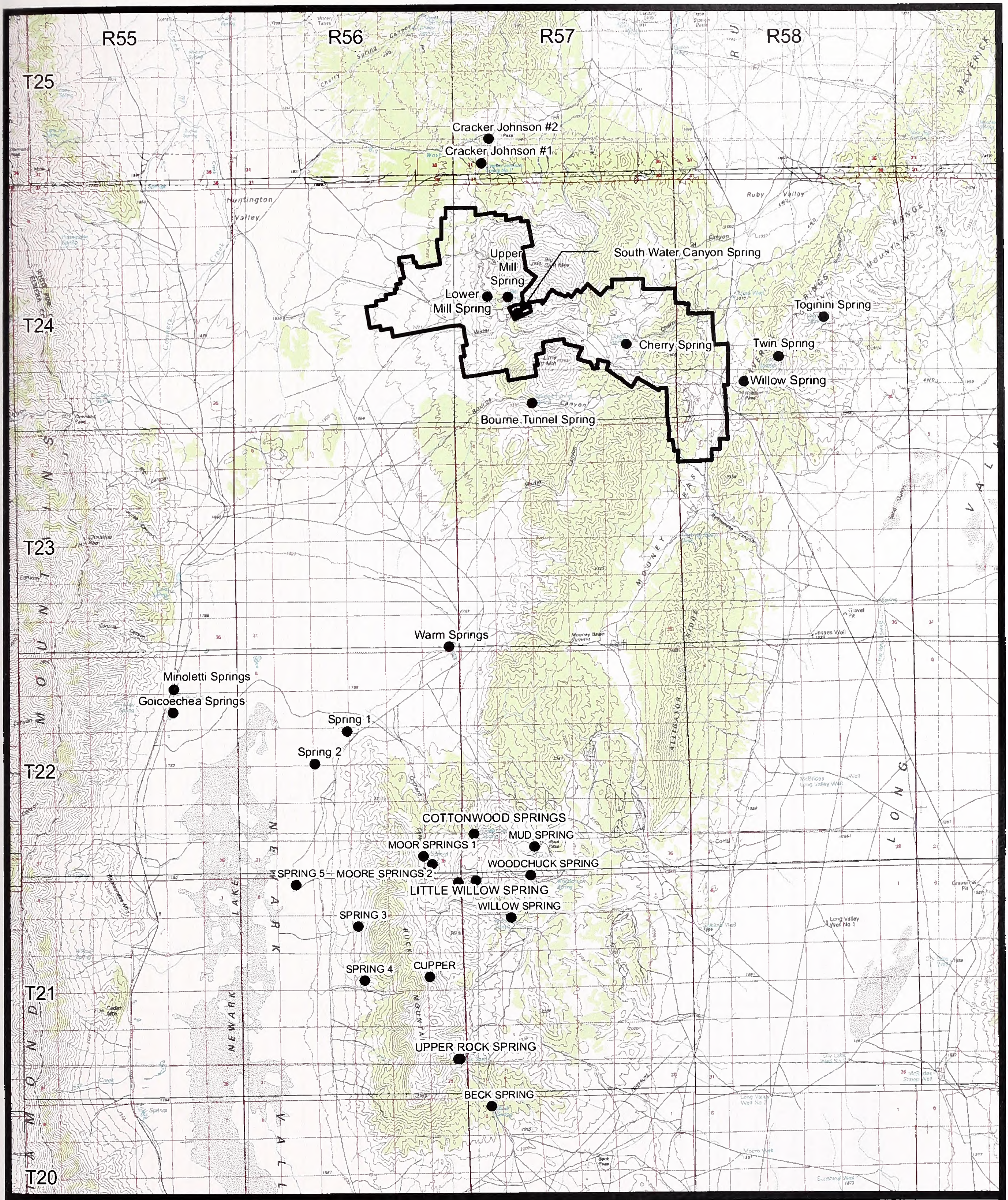
BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-1
HYDROGRAPHIC BASINS



Legend

North Operations Project Boundary

● Springs (Tetra Tech, 2007)

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-2
SEEP AND SPRING LOCATIONS

TABLE 3-1 WATER QUALITY OF SPRINGS

Parameter (mg/l unless otherwise noted)	Nevada Water Quality Standard	Bourne Tunnel Spring	Cherry Spring				Cracker Johnson Spring #1			
		1994[1]	1989[2]	3Q 2006[3]	1Q 2007[3]	2Q 2007[3]	1994[1]	2Q 2006[3]	3Q 2006[3]	2Q 2007[3]
Easting		622,420 m E	626,445 m E	626,445 m E	626,445 m E	626,445 m E	620,275 m E	620,275 m E	620,275 m E	620,275 m E
Northing		4,418,400 m N	4,421,120 m N	4,421,120 m N	4,421,120 m N	4,421,120 m N	4,428,969 m N	4,428,969 m N	4,428,969 m N	4,428,969 m N
Flow (gpm)								~1	<1	<1
TDS	500-1,000	265	81	177		113	405	450		346
Temp (˚F)			34	67.46	62.24	71.96		72.32		59.9
pH	6.5-8.5	7.81	7.6	7.8		7.37	8.18	8.07		8.31
Alkalinity				81		68		266		222
Ca			5.6	27.9		16		61		37.3
Mg	125-150	20.9		10		5	34.5	35.1		31.8
Na			1.4	20.4		13		46.1		40.1
K				1.1		<0.5		5.1		2.8
HCO_3			130	98		83		325		266
CO_3			0	0		0		0		3
SO_4	250-500	11.5		31		14	36	71		47
Cl	250-400	2.5	5.3	20		6	32.9	41		32
F	2.0-4.0	0.1		<0.1		0.1	0.13	0.1		0.2
SiO_2				14		13		22.8		17.6
Fe	0.3-0.6	<0.05		1.54			0.09	0.95		<0.01
Mn	0.05-0.10	<0.01		0.006			0.18	0.286		0.006
Al	0.05-0.2			0.05		0.05		6.76		0.05
Sb	0.005			<0.001		<0.001		0.008		0.001
As	0.05	<0.01		0.01		0.006	0.02	0.022		0.016
Ba	2.0	0.02		0.097		0.058	0.33	0.446		0.175
Be	0.004			<0.001		<0.001		<0.001		<0.001
B				0.04		<0.007		0.14		0.1
Cd	0.005	<0.01		<0.001		<0.001	<0.01	<0.001		<0.001
Cr	0.1	<0.01		<0.001		<0.001	<0.01	<0.001		<0.001
Cu	1.3	<0.01		0.001		<0.001	<0.01	0.011		0.002
Pb	0.015	<0.01		<0.001		<0.001	<0.01	0.008		<0.001
Hg	0.002	0		<0.0005		<0.0005	0	0.0008		<0.005
Ni				<0.001		<0.001		<0.001		<0.001
Se	0.05	<0.01		0.001		<0.001	<0.01	<0.001		0.001
Ag	0.1	<0.01		<0.001		<0.001	<0.01	<0.001		<0.001
Tl	0.002			<0.0005		<0.0005		<0.0005		<0.0005
Zn	5.0	<0.01		<0.01		<0.01	<0.01	0.06		<0.01
NO_3-N	10	1.03		1		1.1	2.69	1.7		0.8

Notes: Samples taken in 2005 and 2006 were analyzed for total metals.
Samples taken in 2007 were analyzed for dissolved metals.
˚F = Degrees Fahrenheit
[1] Date of sampling was not specified (Simon Hydro-Search, 1994b)
[2] Date of sampling was not specified (Pupacko et al., 1989)
[3] Tetra Tech, 2007

Parameter (mg/l unless otherwise noted)	Cracker Johnson Spring #2					Lower Mill Spring				Upper Mill Spring	
	1986[1]	2Q 2006[2]	3Q 2006[2]	1Q 2007[2]	2Q 2007[2]	3Q 2005	1Q 2006	3Q 2006	2Q 2007	1989[3]	4Q 2005[2]
Easting	623,325 m E	623,325 m E	623,325 m E	623,325 m E	623,325 m E	620,516 m E	620,516 m E	620,516 m E	620,516 m E	621,357 m E	621,357 m E
Northing	4,430,047 m N	4,430,047 m N	4,430,047 m N	4,430,047 m N	4,430,047 m N	4,423,191 m N	4,423,191 m N	4,423,191 m N	4,423,191 m N	4,423,159 m N	4,423,159 m N
Flow (gpm)		<1	<1	<<1	<<1	2	5.7	1.5	1.15		1.5
TDS	400	1290		453	655	366	353	394	341	297	347
Temp (˚F)	35	72.59		72.68	59	54.86	42.62	71.78	59.72		55.94
pH	7.9	7.77		8.39	7.94	7.85	7.79	7.21	7.35	8.2	8.14
Alkalinity		470		274	450	268	260	260	255		175
Ca	55	390		29	42.9	98.1	93.9	108	86		73.9
Mg	11	70.6		26	25.6	14.5	12.6	14.8	12	11	24.2
Na	60	141		83	134	16.1	12.8	17.5	14	272	18.7
K	1.8	34.1		13	20.3	1.4	1.5	1.9	2	15	1.1
HCO_3	250	573		327	549	326	318	317	311	90	214
CO_3	0	0		4	0	<1	<1	<1	<1	8	0
SO_4	55	167		66	38	20	24	24	23	43	21
Cl	46	1047[4]		43	73	17	16	26	14	2475[4]	63
F		2.1		1.6	2.1	0.2	0.2	0.2	0.2	0.9	0.2
SiO_2	43	97.6		26.7	47.2	29.0	29.2	34.1	29.6		20
Fe		27.6		0.07	0.31	<0.01	<0.01	<0.01	<0.01		<0.01
Mn		4.45		0.003	0.091	0.001	<0.001	0.001	<0.001		<0.001
Al		69		0.08	0.28	<0.01	<0.01	<0.01	<0.01		<0.01
Sb		<0.001		0.002	0.002	0.001	<0.001	<0.001	0.001		0.001
As		0.34		0.087	0.192	0.012	0.011	0.012	0.012		0.007
Ba		3.16		0.08	0.201	0.117	0.110	0.123	0.107		0.102
Be		0.01		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
B		0.985		0.5	0.8	0.08	0.084	0.10	<0.007		0.08
Cd		<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	0.001		<0.001
Cr		0.071		<0.001	0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Cu		0.098		0.004	0.005	0.001	0.001	<0.001	<0.001		<0.001
Pb		0.066		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Hg		0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005
Ni		0.106		0.002	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Se		<0.001		0.002	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Ag		<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001
Tl		<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005		<0.0005
Zn		0.46		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01
NO_3-N		<0.1		<0.1	<0.1	1.9	2.1	2.6	1.9		4.6

Notes: Samples taken in 2005 and 2006 were analyzed for total metals.

Samples taken in 2007 were analyzed for dissolved metals.

[1] Date of sampling was not specified (Welch and Williams, 1986)
[2] Tetra Tech, 2007
[3] Date of sampling was not specified (Pupacko et al., 1989)
[4] Values are reported in Table 3-1 as indicated in original reference. These values appear to be anomalous as they do not coincide with the TDS value reported for the sample.

Parameter (mg/l unless otherwise noted)	Tognini Spring					South Water Canyon Spring							Willow Springs (North)
	4Q 2005	2Q 2006	3Q 2006	1Q 2007	2Q 2007	1989[1]	1989[1]	1989[1]	4Q 2005[2]	2Q 2006[2]	1Q 2007[2]	2Q 2007[2]	4Q 2005
Easting	635,133 m E	635,133 m E	635,133 m E	635,133 m E	635,133 m E	621,684 m E	621,684 m E	621,684 m E	621,684 m E	621,684 m E	621,684 m E	621,684 m E	631,524 m E
Northing	4,422,196 m N	4,422,196 m N	4,422,196 m N	4,422,196 m N	4,422,196 m N	4,422,480 m N	4,422,480 m N	4,422,480 m N	4,422,480 m N	4,422,480 m N	4,422,480 m N	4,422,480 m N	4,419,477 m N
Flow (gpm)	2	0.1	0.06		5.8				15	6			2
TDS	248	252	273	257	259	279			279	284		252	249
Temp (°F)	59.54	57.92	62.42	61.16	62.96	54	64	66	54.68	53.6	54.32	62.42	56.12
pH	8.08	7.79	7.79	7.71	7.59	7.6	7.9	7.9	8.9	8.27		7.68	8.04
Alkalinity	180	176	180	188	190				205	166		252	160
Ca	71.3	65.5	79.5	71	71	18.4			69.9	61		62	61
Mg	6.2	5.5	6.6	6	6		4.7	1.3	12	13.5		10	5.5
Na	12.9	13.9	14.1	13	12	2.9	15.5	13.9	12.4	17		11	21.5
K	0.9	1.3	1.1	<0.5	9				2.3	1.4		2	0.8
HCO_3	220	215	231	230	232	209			246	203		246	195
CO_3	<1	<1	<1	<1	<1	9			3	6		6	<1
SO_4	21	21	21	22	22	9			15	29		11	28
Cl	9	9	71	9	8	12.6	3.9	2.7	17	34		6	15
F	0.2	0.1	0.1	0.2	0.2		0.2		0.2	0.2		0.2	0.2
SiO_2	14.0	14.0	15.5	13.9	15.3				25.3	26.8		24.2	17.0
Fe	<0.01	<0.01	<0.01	<0.01	<0.01				0.26	1.52		0.02	<0.01
Mn	<0.001	<0.001	0.002	<0.001	<0.001				0.046	0.07		0.011	<0.001
Al	<0.01	0.26	<0.01	<0.01	<0.01				0.06	1.47		<0.01	<0.01
Sb	<0.001	<0.001	<0.001	<0.001	<0.001				<0.001	0.006		<0.001	<0.001
As	0.002	0.002	0.002	0.002	0.002				0.031	0.026		0.024	0.003
Ba	0.049	0.049	0.049	0.049	0.046				0.111	0.137		0.094	0.185
Be	<0.001	<0.001	<0.001	<0.001	<0.001				<0.001	<0.001		<0.001	<0.001
B	0.07	0.049	0.08	<0.007	<0.007				0.07	0.112		<0.007	0.10
Cd	<0.001	<0.001	<0.001	<0.001	<0.001				<0.001	<0.001		<0.001	<0.001
Cr	<0.001	<0.001	<0.001	<0.001	<0.001				<0.001	<0.001		<0.001	<0.001
Cu	<0.001	<0.001	<0.001	<0.001	<0.001				<0.001	<0.001		<0.001	<0.001
Pb	<0.001	<0.001	<0.001	<0.001	<0.001				<0.001	0.002		<0.001	<0.001
Hg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				<0.0005	0.0008		<0.0005	<0.0005
Ni	<0.001	<0.001	<0.001	<0.001	<0.001				<0.001	0.004		<0.001	<0.001
Se	<0.001	0.001	<0.001	<0.001	<0.001				<0.001	<0.001		<0.001	0.002
Ag	<0.001	<0.001	<0.001	<0.001	<0.001				<0.001	<0.001		<0.001	<0.001
Tl	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				<0.0005	<0.0005		<0.0005	<0.0005
Zn	<0.01	<0.01	<0.01	<0.01	<0.01				<0.01	0.03		<0.01	<0.01
NO_3-N	0.9	2.2	2.3	2.1	2.3				0.3	0.5		0.3	1.0

Notes: Samples taken in 2005 and 2006 were analyzed for total metals.
Samples taken in 2007 were analyzed for dissolved metals.
[1] Date of sampling was not specified (Pupacko et al., 1989)
[2] Tetra Tech, 2007

Proposed Action area: carbonate rocks, shales, volcanic rocks, intrusive granitic rocks, and alluvial valley fill.

Table 3-1 summarizes water quality data measured in the springs within and near the Proposed Action area. With the exception of arsenic, baseline water quality measurements demonstrate that water quality is generally good and is predominantly calcium or calcium/sodium bicarbonate water. Analytical results are generally within the Nevada water quality standards with the exception of arsenic. Most springs have demonstrated background arsenic levels near or above the 0.05 micrograms per liter Nevada water quality standards. Elevated arsenic in surface water and groundwater is commonly found in mineralized areas (USGS, 2004; Welch, 1988, 2000).

The body of surface water closest to the Proposed Action area is Ruby Lake. The south side of Ruby Lake is located approximately seven miles north of the Proposed Action area at the southern end of Ruby Valley within the Ruby Lake National Wildlife Refuge (Figure 3-1). The lake is fed by numerous springs along the eastern face of the Ruby Mountains and by expressions of near-surface alluvial groundwater in southern Ruby Valley. Virtually all groundwater in Ruby Valley is derived from three sources: precipitation that falls within the Ruby Valley hydrographic basin, infiltration of stream flow from the east side of the southern Ruby Mountains, and subsurface inflow from northern Butte Valley (USGS, 2005a). Evapotranspiration represents the largest outflow of water from Ruby Valley, the largest component of which occurs from the valley floor. While Ruby Lake is a terminal lake, water quality is good, mainly due to the large inflow from springs and, to a lesser extent, northward flow toward Franklin Lake (USGS, 2005a). Ruby Valley is not hydrologically connected to the springs and other ephemeral surface flow within the Proposed Action area (BLM, 1995a and USGS, 2005a).

3.2.2 Surface Water Environmental Consequences

Proposed Action

Anticipated environmental impacts to surface water resources include possible increases in erosion due to various areas being cleared of native vegetation and local soils being disrupted, potential drainage from rock disposal areas, recharge reduction or relocation due to placement of facilities, and potential impacts to surface waters due to spills of chemicals used on-site. Each of these anticipated impacts is described below.

Erosion potential may be increased under the Proposed Action due to the removal of vegetation, stockpiling of soil, and alteration of the soil structure. New or expanded rock disposal areas, haul roads, and other surface disturbance would be designed to control stormwater flows in a manner similar to what has been successfully implemented for existing operations. Existing Best Management Practices (Appendix D) are effectively managing stormwater flow and controlling erosion at the existing operations. With implementation of the appropriate Design Features (Table 2-13), such as interim seeding, stockpiles, diversion channels, straw bales, silt fences, and sediment ponds, increased sedimentation to drainages would be minimized.

The Proposed Action entails expansions of existing pits. Waste rock from these pits has been characterized to evaluate the potential for acid generation from the rock disposal areas (SRK, 2003; Schafer, 2008 and 2009). Since the Proposed Action would involve expansion of the existing pits, the waste rock that would be encountered is expected to be similar in nature to waste rock that has previously been analyzed. The waste rock at the BMM operation has been undergoing characterization since 1995 and would continue to be evaluated as long as mining occurs. Quarterly sampling is also conducted in compliance with the Water Pollution Control Permit for the BMM. Waste rock has been analyzed for acid base accounting, total sulfur, Meteoric Water Mobility Procedure, and kinetic testing analyses. The borehole locations sampled during the waste rock characterization are shown on Figures 2-3, 2-4, 2-5, and 2-6. These analyses, along with the geology and mineralogy, were used to determine the potential for acid generation and potential to degrade the waters of the State.

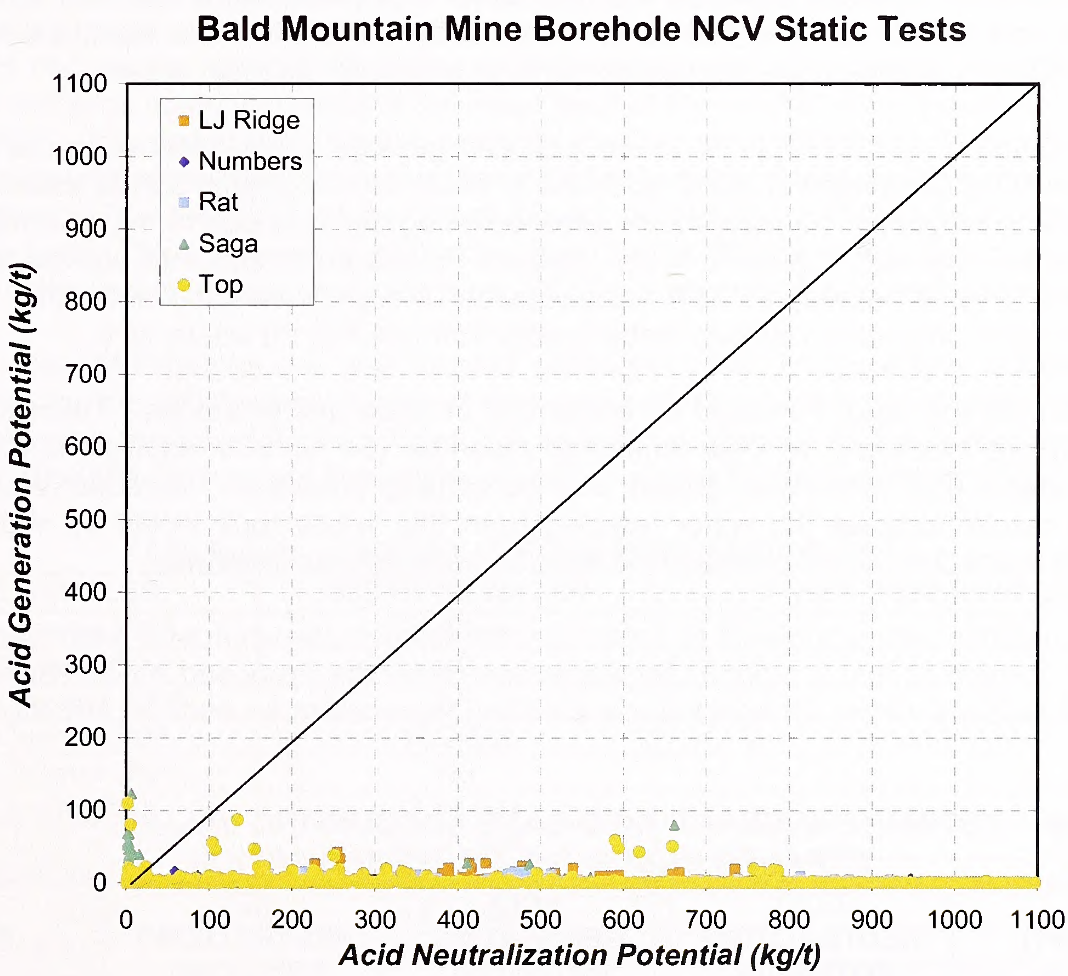
Static acid base accounting testing, Meteoric Water Mobility Procedure analyses, and kinetic testing of materials to be mined as part of the Proposed Action were completed and are reported in SRK Consulting (SRK, 2003; Schafer, 2008 and 2009) and portions of quarterly Water Pollution Control Permit reports submitted by BMM. Waste rock characterization completed for the currently permitted facilities is included in the BMM EIS (BLM, 1995a). The dataset for the BMM includes 144 quarterly waste rock composite samples and 1,556 samples that are 20-foot hole composites taken from exploration drill hole core at LJ Ridge, the Numbers Pits, Top Pit, Sage Flats, Rat, and Saga Pits. The quarterly samples were analyzed for acid drainage risk and metal mobility risk. The exploration samples were analyzed for acid drainage risk, total metals, and metal mobility risk. BLM guidelines state that the acid neutralization potential to acid-generating potential ratio must be greater than three and the acid neutralization potential must be greater than 20 equivalent tons of alkalinity per 1,000 tons of rock to be characterized as non-acid generating. As noted in SRK Consulting (2003), Schafer (2008 and 2009), and observed in more recent quarterly Water Pollution Control Plan compliance sampling, not all of the samples meet these criteria; however, no samples produced a pH below six by Meteoric Water Mobility testing. Quarterly sampling results from the Top, Horsehoe/Bida, Sage Flats, Rat, and Saga Pit areas for 2003 through 2007 are included in Appendix E. Kinetic tests were conducted on ten samples which had negative net neutralizing potential values. The kinetic tests were run for between 20 and 28 weeks. Only one kinetic test showed pH levels below 6, however the leachate in this sample became alkaline later during the test. The kinetic tests also showed metals leached were below detection with the exception of arsenic, antimony, mercury, barium, and iron, which had low measurable values in some samples. The results from the kinetic tests are included in Appendix E.

Chart 1 shows the results of the acid-neutralizing potential and acid-generating potential testing of the bore holes from the Proposed Action (Schafer, 2008). The results indicate that most materials have a higher acid-neutralizing potential than acid-generating potential. A few samples from the Saga and Top areas may have higher acid-generating potentials. The Top Pit and Saga Pit results are due to the silicification of the rock in which the limestone is replaced with silica. This silicification is often associated with the ore body, while surrounding rocks often still contain higher amounts of unaltered limestone. The waste rock from these areas will therefore most likely have higher limestone contents and therefore higher neutralizing potential than the ore bodies themselves.

Figure 35 in the Schafer (2008) report shows the results from the Meteoric Water Mobility testing (Schafer, 2008). Figure 6 in the Schafer (2008) report shows similar published data from other mines in Nevada (Schafer, 2008). These figures shows the total base metals (cadmium, cobalt, copper, lead, nickel, and zinc) leached during the testing as compared with the pH of the leachate. All samples from the Proposed Action had pH values above six. Only three of the 122 samples had total base metal values greater than ten milligrams per liter. The potential for production of acidic waters and mobilization of metals is low at BMM due to low rainfall, pervasive alkaline conditions, and the abundance of iron which increases the tendency for oxyanions, such as arsenic and antimony to adsorb. The rocks in the Bald Mountain area are generally high in carbonates, which have high capacities to neutralize acid, and have been extensively oxidized, which decreases the potential for the material to generate acid. Details of the geology and analytical results for each pit area are included below.

The Horseshoe/Bida/Belmont pits are located in Guilmette limestone and granodiorite porphyry. The acid neutralization potential for this waste rock ranges from less than one to 300 tons alkalinity per 1,000 tons. The highest sulfide-sulfur sample was 0.5 percent sulfide by weight. Approximately 57 percent of the waste would be porphyry material. The highly leached breccia comprises 23 percent of the waste, while the rest includes limestone and alluvium. Waste rock from the Horseshoe Pit is anticipated to be alkaline with slightly elevated levels of arsenic, antimony, and mercury shown in the Meteoric Water Mobility Procedure leachates. Although the acid neutralization potential values for material from the Bida Pit from 2005 through 2007 are below three for most samples, the acid-generating potential values are below 20, which would indicate while the material has little potential to neutralize acid and it also has little potential to generate acid. The leachate results indicate there will be no chemical impacts to surface water quality from the Horseshoe waste rock.

CHART 1 ACID-NEUTRALIZING POTENTIAL AND ACID-GENERATING POTENTIAL FOR BOREHOLE SAMPLES AT THE PROPOSED ACTION



The Top Pit has a more complex geology, and waste rock would include silicified and argillized porphyry with low buffering capacity and trace sulfides, and unmineralized oxide siltstone and limestone. The waste rock is anticipated to be predominantly oxide (less than 0.05 percent sulfide by weight). Although the porphyry may produce some trace elements, the limestone host rock contains significant buffering capacity, which would make the potential overall leachate good quality (946 equivalent tons calcium carbonate per 1,000 tons). The Mahoney Canyon area (Top Pit area) contains mainly granodiorite rock with low buffering potential but also low sulfide content. Meteoric Water Mobility Procedure testing indicates that any potential leachate from waste rock from this pit area may have antimony, arsenic, and mercury concentrations slightly above Nevada Profile I standards, which is a common geochemical signature in Carlin-type ore bodies. Elevated antimony, arsenic and mercury in surface water base flow are typical features of mineralized areas of Nevada. Evidence of this is indicated in water quality analysis from South Water Canyon Spring (Table 3-1), whose recharge area has not been impacted by mining activities. No seepage or surface flow from the toe of the existing waste rock disposal areas in the Top Pit area has been observed during current operations. Based on current operations and monitoring, no impacts are anticipated to surface water quality from the Top Pit waste rock (Appendix E).

The Sage Flats Pit area geology is similar to that of the adjacent Top Pit area. The area is a skarn zone (i.e., zone of mineral deposit) with traces of minor sulfides and secondary minerals associated with crystallized carbonates. Most of the waste rock in the Sage Flats area shows limited potential for acid generation because of the low sulfide content; however, the low buffering capacity associated with some of the rock types indicates that the acid neutralization potential is less than 20 equivalent tons alkalinity per 1,000 tons of rock. The Meteoric Water Mobility Procedure analyses indicated that the same rock produced a leachate with neutral to alkaline pH and low solute concentrations. These results indicate there would be no chemical impacts to surface water quality from the Sage Flats area rock disposal areas.

Quarterly sampling from the Rat Pit waste rock and geologic cross-sections of the pit indicate the rock would be composed of either dolomite or shale with negligible sulfide values (less than 0.01 percent by weight). The rock shows large buffering capacity due to the dolomite, and little acid-generating potential. Meteoric Water Mobility Procedure results indicate the water would meet Nevada Profile I standards with the exception of slightly elevated antimony. Therefore, there would be no impacts to surface water quality from the Rat Pit waste rock.

Waste rock from the Saga Pit would be comprised of shale and limestone. The rock has been shown to have moderate to high buffering potential (54 to 306 equivalent tons calcium carbonate per 1,000 tons) with limited acid-generating potential. Meteoric Water Mobility Procedure results indicate the water leached from this waste rock would be within Nevada Profile I standards with slightly elevated aluminum, antimony, and arsenic.

A material balance was completed to determine the relative abundance of each lithology in the waste rock at each pit that is planned for expansion under the Proposed Action (Schafer, 2009). Anticipated average values for acid base accounting parameters for each pit are shown in Table 3-2.

TABLE 3-2 ESTIMATE AVERAGE ACID BASE ACCOUNTING VALUES FOR PITS TO BE EXPANED UNDER THE PROPOSED ACTION

AREA/PIT	ACID NEUTRALIZING POTENTIAL	ACID GENERATING POTENTIAL	NET NEUTRALIZING POTENTIAL	RATIO
LJ Ridge	446.1	5.0	440.2	89.2
North Pits 1-3	367.9	2.5	365.4	147.2
Rat	722.3	1.7	720.6	424.9
Top/Sage Flats	686.7	2.4	684.2	286.1
Bida	168.1	14.0	154.1	12.0
Saga	209.6	16.5	193.1	12.7

The acid base accounting and Meteoric Water Mobility Procedure results indicate BMM North Operations Area Project waste rock would be net neutralizing, which means that no acidic waters would be generated from meteoric water leaching through the waste rock. BMM would continue to sample and monitor waste rock to evaluate any unexpected material. Results of waste rock sampling and analyses during current operations have identified limited insignificant amounts of potential acid-generating material from the existing pits that would be expanded with the Proposed Action. Because similar geologic material would be encountered with the Proposed Action (primarily expansion of existing pits), previous static and kinetic tests are representative. As of May 2009, no seepage has been observed from the existing rock disposal areas (Atiemo, 2009).

The potential of mining activities to reduce recharge areas for Cherry Spring has also been considered. The expansion of the East Sage Rock Disposal Area and construction of the Sage Flat Rock Disposal Area could decrease recharge to Cherry Spring (Figure 3-3). The spring is likely fed by an aquifer that is recharged by infiltration of precipitation in the watershed uphill from the spring. Expansion of the rock disposal area would cover approximately 65.1 acres of the (130.5 acre) recharge area. Rainfall and snowmelt that currently infiltrate into the ground surface within this area would have to percolate through the waste rock before entering the natural ground surface beneath the fill. During its transit through the waste rock, some portion of the infiltrating water would be expected to be stored in the overburden or evapo-transpired, which would reduce the amount of recharge water compared with natural conditions. This reduction in recharge could then reduce the water level of the aquifer and decrease the flow rate from the spring. It is noted that there is currently no flow emanating from Cherry Spring, and recent water levels taken from the development (pipe) at the spring location are well below ground surface. The presence of the development pipe indicates there was flow from this spring in the past. The exact cause of the decrease in the Cherry Spring flow is not known at this time. Depths to water measurements from 2005 for Cherry Spring are shown in Table 3-3.

Upper and lower Mill springs are also located within the Plan of Operations boundary. The recharge area for the Mill Springs is east of the proposed disturbance and would therefore not be impacted by the Proposed Action. There are no facilities planned in the recharge area of the Mill Springs. The Mill Springs are thought to be fed by a local aquifer similar to Cherry Spring.

TABLE 3-3 CHERRY SPRING MONITORING DATA

DATE SAMPLED	DEPTH TO WATER	OTHER OBSERVATIONS
Fourth Quarter 2005	23.0 feet	
First Quarter 2006	NS	
Second Quarter 2006	NS	
Third Quarter 2006	18.3 feet	
Fourth Quarter 2005	NS	
First Quarter 2007	23.86 feet	
Second Quarter 2007	11.14 feet	
08/08/2007	30.2 feet	
12/18/2007	48.4 feet	
12/18/2007	49 feet 5 inches	
03/31/2008	NS	Snow cover, no visual flow
06/10/2008	Surface Flow	Approximately 1 gallon per minute
06/10/2008	4 feet 6 inches	
06/18/2008	7 feet 3 inches	
07/01/2008	15 feet 3 inches	
08/04/2008	22 feet 10inches	
08/04/2008	33 feet 4 inches	
10/01/2008	46 feet 8.5 inches	
11/05/2008	47 feet 1 inches	
12/01/2008	48 feet 7 inches	Damp
01/21/2009	48 feet 8 inches	Dry

DATE SAMPLED	DEPTH TO WATER	OTHER OBSERVATIONS
02/03/2009	NS	Dry
03/01/2009	NS	Snow cover, no visual flow
04/01/2009	24 feet 4 inches	

As Recorded by Vector/Tetra Tech in 2005-2007, and BMM since 12/18/07.
NS = Not Sampled

South Water Canyon Spring and the Bourne Tunnel Spring are located nearly adjacent to the Plan of Operations boundary. These springs are also fed by local aquifer systems. The Bourne Tunnel Spring would not be impacted by the Proposed Action, since the source of recharge is south of the Proposed Action area. No impacts to South Water Canyon Spring by the Proposed Action are anticipated because there is no proposed disturbance in this recharge area. There is no proposed disturbance in this area, and thus no impact is anticipated.

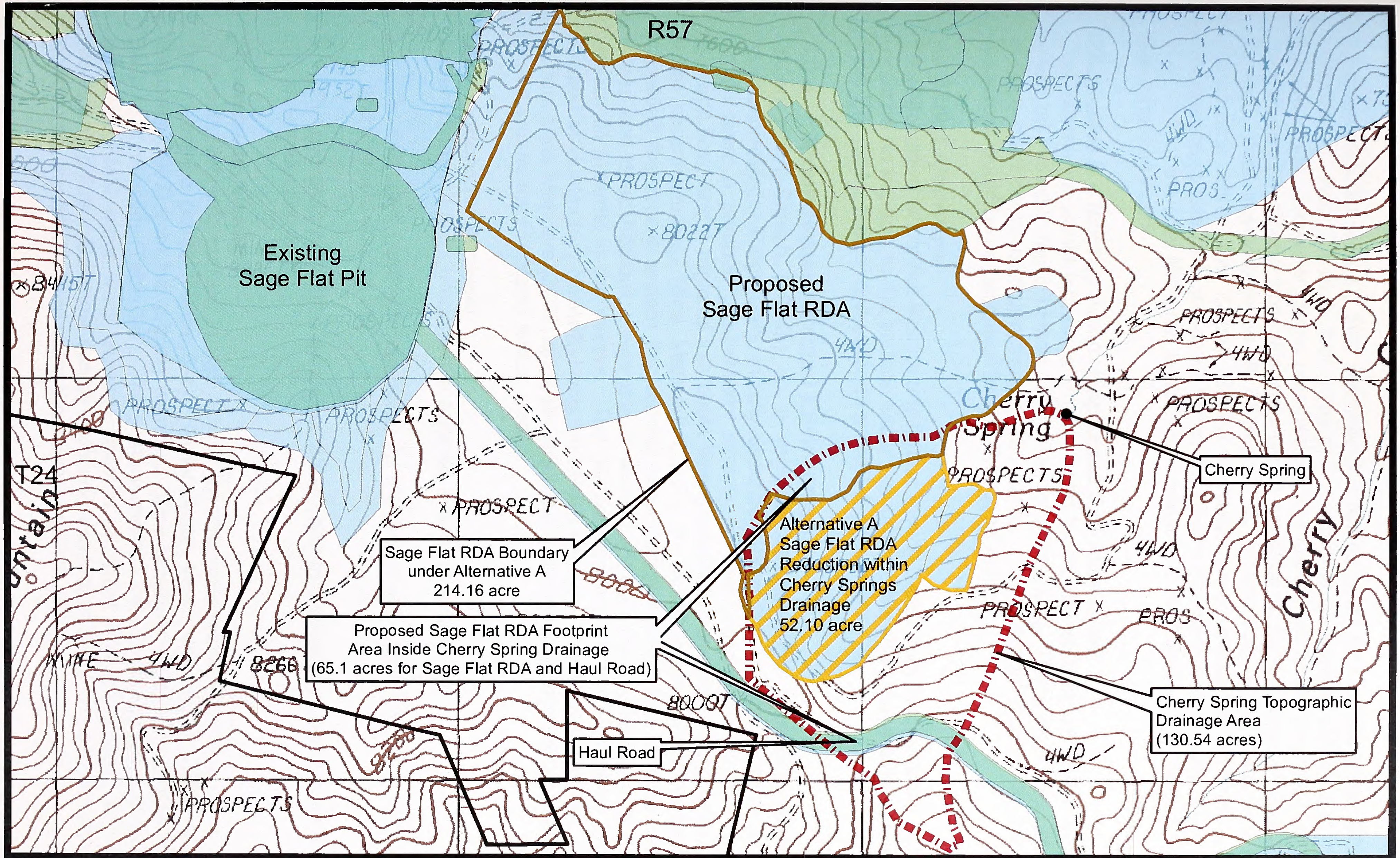
Willow Springs, Twin Springs, and Tognini Spring are located east of the Proposed Action in the Maverick Springs Range. Their recharge sources are located within the Maverick Springs Range. These recharge sources would not be hydrologically linked to the Proposed Action, and there is no disturbance planned for this area. Therefore, there would be no impact to these springs from the Proposed Action.

The BMM North Operations Area Project Plan of Operations (BMM, 2009) for the Proposed Action includes detailed discussion of chemical handling practices that are currently in use and would continue to be used to assure proper handling of solvents, fuels, and any other chemicals in accordance with all applicable state and federal regulations. If spills occur, appropriate emergency procedures, as provided in the Spill Contingency Plan (BMM, 2009), would be used to prevent or minimize impacts to surface water and drainages.

Water quality data shown in Table 3-1 does not indicate any downward trends in surface water quality as a result of current or past mining operations. Potential direct impacts to surface waters in the Proposed Action would be avoided by implementation of Design Features (Table 2-13). Potential indirect impacts of the Proposed Action would include increased erosion due to clearing of vegetation from the proposed disturbance areas, potential drainage from the rock disposal areas, recharge reduction due to the expansion of rock disposal areas, and chemical spills. As discussed above, these indirect impacts would also be avoided by implementation of Design Features (Table 2-13). The recharge area of Cherry Spring could potentially be impacted by the placement of waste rock over the recharge area.

Alternative A – Partial Backfill Alternative
This alternative would not decrease the level of mining. The only difference would be approximately 434 acres less disturbance allocated for rock disposal areas. The backfilled pits would be above the ambient groundwater level. The potential impacts to surface water resources would be less surface disturbance and thus a potential reduction in areas contributing to erosion and sedimentation to drainages. Impacts to surface water quality would be the same as the Proposed Action.

Potential impacts to the Cherry Spring recharge area would be reduced significantly through a reduction in the size of the Sage Flat Rock Disposal Area under Alternative A. The original design of the Sage Flat Rock Disposal Area would have covered approximately 65.1 acres of the Cherry Spring recharge area, which includes the rock disposal area, soil stockpile, and haul road. With the reduced Sage Flat Rock Disposal Area (including the soil stockpile area), the acreage of the Cherry Spring recharge area impacted by the rock disposal area would be



Legend

- North Operations Project Boundary
- Existing/Authorized Disturbance Area
- Proposed Disturbance Area
- Cherry Spring Topographic Drainage Area
- Sage Flat RDA Boundary Under Alternative A
- Alternative A Reduction Area

N

0 600 1,200 1,800
Feet
1:14,400

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FIGURE 3-3
CHERRY SPRING DRAINAGE AREA

approximately 9.0 acres. This represents a reduction of 52.1 acres or an 80% reduction in disturbance. Approximately four acres of the recharge area would continue to be impacted by the haul road. However, since precipitation and snow melt would continue to run off the haul road surface, moisture from this area would continue to be a source of recharge for Cherry Spring. With implementation of Alternative A, a reduction of approximately 52.1 acres of disturbance within the Cherry Spring recharge area would be realized. The resulting disturbance (waste rock and road) within the Cherry Spring recharge area would represent less than 10% of the total recharge area. Other impacts to surface water would be as described for the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative

This alternative would include a smaller heap leach pad at Mooney Basin; however, the ore would be hauled to the 2/3 Heap Leach Pad for processing. There would also be a reduction in surface disturbance of approximately 105 acres. The potential impacts to the surface water resources would be as described for the Proposed Action.

No Action Alternative

This alternative would not include any further mining, other than that currently permitted. There would be no impacts to the surface water resources other than that previously disclosed in the 1995 EIS (BLM, 1995a) and subsequent NEPA documents.

3.2.3 Groundwater Affected Environment

Simon Hydro-Search (1994b), in a regional hydrogeologic characterization of the Bald Mountain/Alligator Ridge area, initially described three groundwater systems in the Proposed Action area: a perched groundwater system, a local groundwater system comprising local bedrock flow, and a regional interbasin flow groundwater system. Using additional data from more recent studies, Mine Mappers (2007), in its hydrogeologic characterization report, simplified the recent system into a local groundwater system that includes shallow perched zones and deep bedrock zones and a second groundwater system that is associated with alluvial fill material in the valleys. The alluvial aquifers are surrounded by bedrock and are located in Huntington, Newark, Long, and Ruby valleys. For purposes of this FEIS, the more current Mine Mappers (2007) analysis was used to enhance interpretation of the hydrogeology in and around the Proposed Action area.

Assumptions for Analysis

Assumptions made for groundwater analysis include the following:

- The estimated cones of depression for the production water wells assume a homogeneous and isotropic aquifer; and

- The hydraulic properties assumed in the cone of depression calculations are averages of the production wells.

Groundwater Quantity

The potentiometric surface in and around the Proposed Action area has been mapped using 164 measured points (Figure 3-4). Groundwater level data points were obtained by Mine Mappers (2007) from five primary sources. Mine Mappers (2007) categorized each source by its level of reliability (Table 3-4). The primary sources for determining the potentiometric surface were the BMM water wells, Nevada Division of Water Resources logs, and mine quarterly monitoring points. Drill hole survey data and exploration driller's log data were used only to corroborate trends identified using the primary sources of data.

TABLE 3-4 POTENTIOMETRIC DATA SOURCES AND RELATIVE RELIABILITY

SOURCE	NUMBER OF DATA POINTS	RELATIVE DATA RELIABILITY
BMM Water Wells	6	High
Nevada Division of Water Resources Logs	36	Medium
Mine Quarterly Monitoring Points	13	Medium
Drill Hole Surveys (IDS)	54	Low
Exploration Driller's Logs	54	Low

The potentiometric surface in the bedrock aquifer in and around the Proposed Action area ranges from approximately 6,500 feet above mean sea level to approximately 7,900 feet above mean sea level. The hydraulic gradient is greater in the bedrock aquifers than in the alluvial aquifers, as to be expected in an unconfined aquifer. The potentiometric surface varies in each alluvial valley, depending upon the elevation of the valley floor; however, it usually ranges from approximately 5,900 feet above mean sea level to 6,100 feet above mean sea level. Figure 3-5 and Figure 3-6 show cross-sections of the potentiometric surfaces in and around the Proposed Action area.

The direction of groundwater flow varies across the Proposed Action area, flowing in four directions from a groundwater divide to each of the hydrographic basins located in the Proposed Action area. For example, the groundwater on the west side of the project flows northwest into Huntington Valley, and the water on the northeast side of the project flows north into Ruby Valley. The water is recharged at or near the groundwater divides that separate each hydrographic basin. Research conducted by the U.S. Geological Survey (USGS, 2005a) indicated the recharge rate into Ruby Valley is between 710,000 and 930,000 acre-feet per year. Another recent report by the U.S. Geological Survey (Welch, 2007) discusses the water resources of Newark and Long valleys. The recharge rates for Newark and Long valleys were reported as 21,000 acre-feet per year for Newark Valley and 25,000 acre-feet per year for Long Valley. Neither study broke out the recharge by areas smaller than the hydrographic basin.

Alluvial aquifer properties were obtained from five pump tests at water wells. Detailed information on the pump tests is included in Mine Mappers (2007). Transmissivity ranged from 0.19 square foot per minute to 1.96 square feet per minute while hydraulic conductivity ranged from 0.55 foot per day to 3.82 feet per day. These hydraulic parameter values are consistent with values for silty sand to clean sand (Freeze and Cherry, 1979), which are the most common material types found during drilling activities. These material types were found during drilling activities. The groundwater flow direction at the BMM wells is to the northwest in Huntington Valley. The groundwater flow direction at the Mooney Basin wells is toward the south in Newark Valley. There are no current Barrick production wells in Long Valley or Ruby Valley.

Mine Mappers (2007) also conducted a water balance of the BMM operation. Recharge is predominantly from precipitation at higher elevations (Rush and Everett, 1966). Recharge to the fault-controlled bedrock aquifer system is by infiltration of precipitation and snowmelt. After infiltration, groundwater flows along faults and fractures through the bedrock system toward the alluvial aquifers within the valleys that lie below the mountain ranges. Recharge to the alluvial aquifer system is also by infiltration of precipitation, snowmelt, and runoff. It also includes contribution from the fault-controlled bedrock aquifer system.

Precipitation varies across the Proposed Action area due to the large elevation changes (9 to 14 inches at lower elevations to 21 inches at higher elevations). Mine Mappers (2007) has estimated that the recharge rate in the Proposed Action area averages 1.9 inches per year

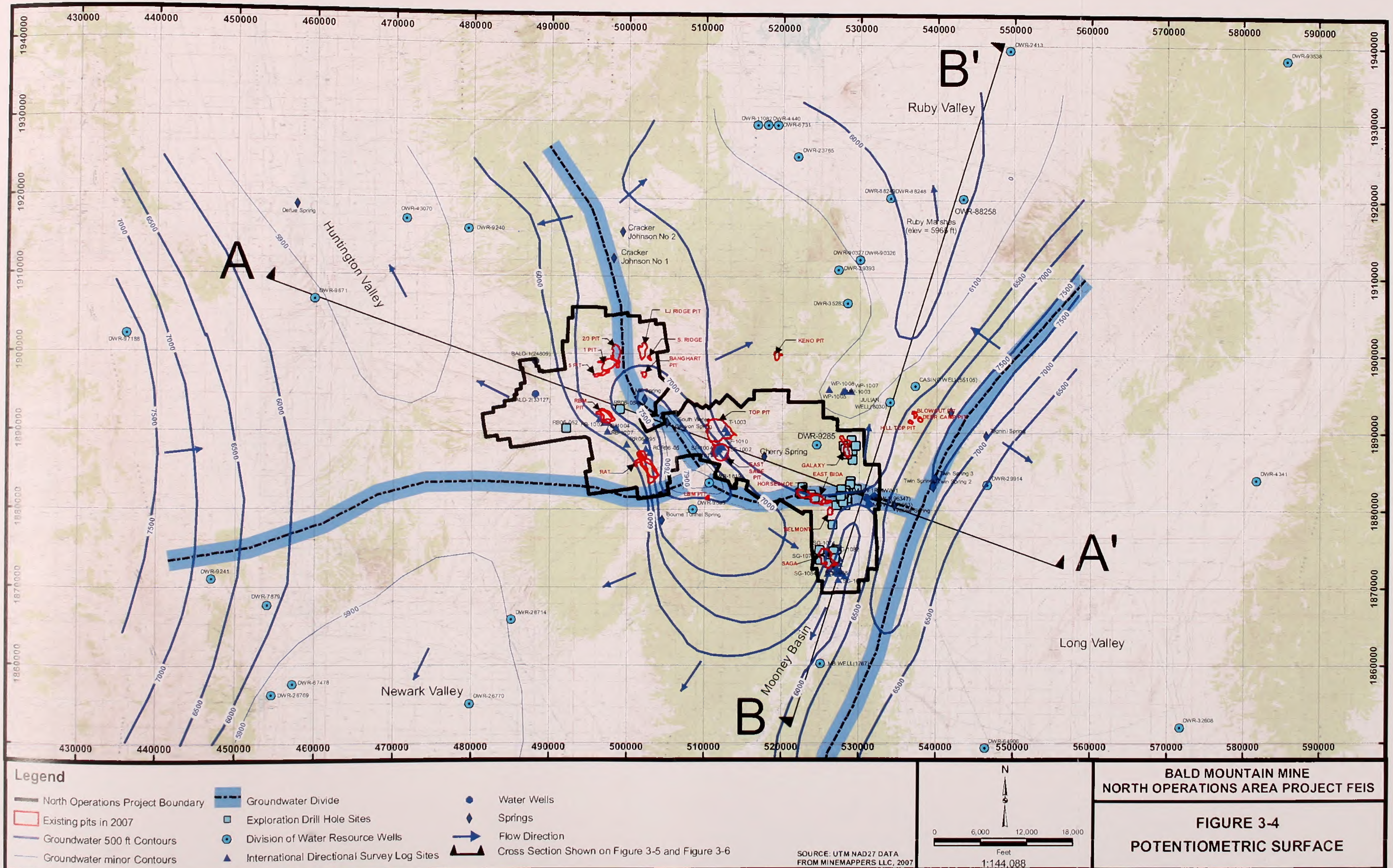
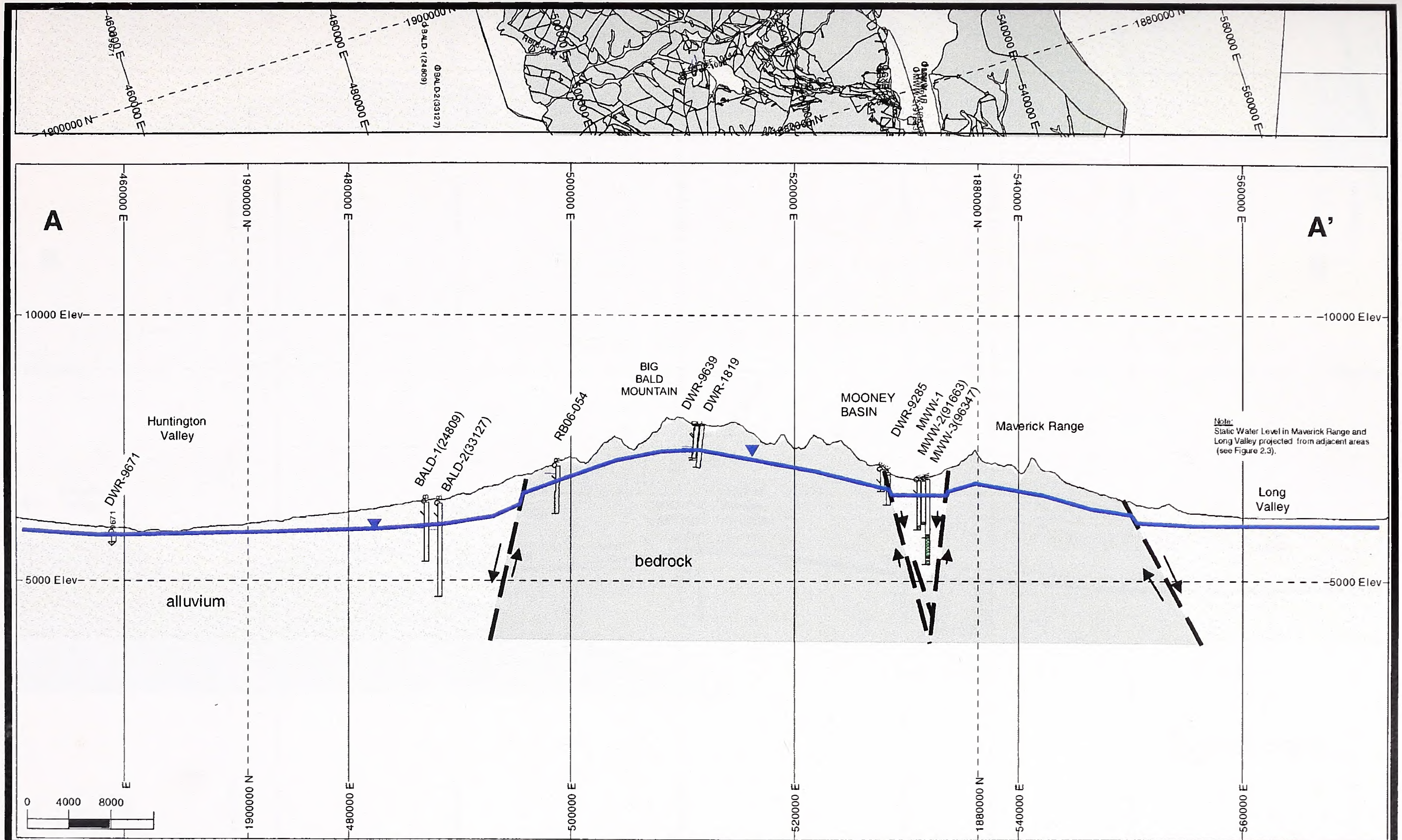


FIGURE 3-4
POTENTIOMETRIC SURFACE



VERTICAL CROSS-SECTION A-A' (NW-SE). SEE FIGURE 3-4 FOR SECTION LOCATION. VERTICAL EXAGGERATION = 5X HORIZONTAL SCALE.

SOURCE: MINEMAPPERS LLC, 2007

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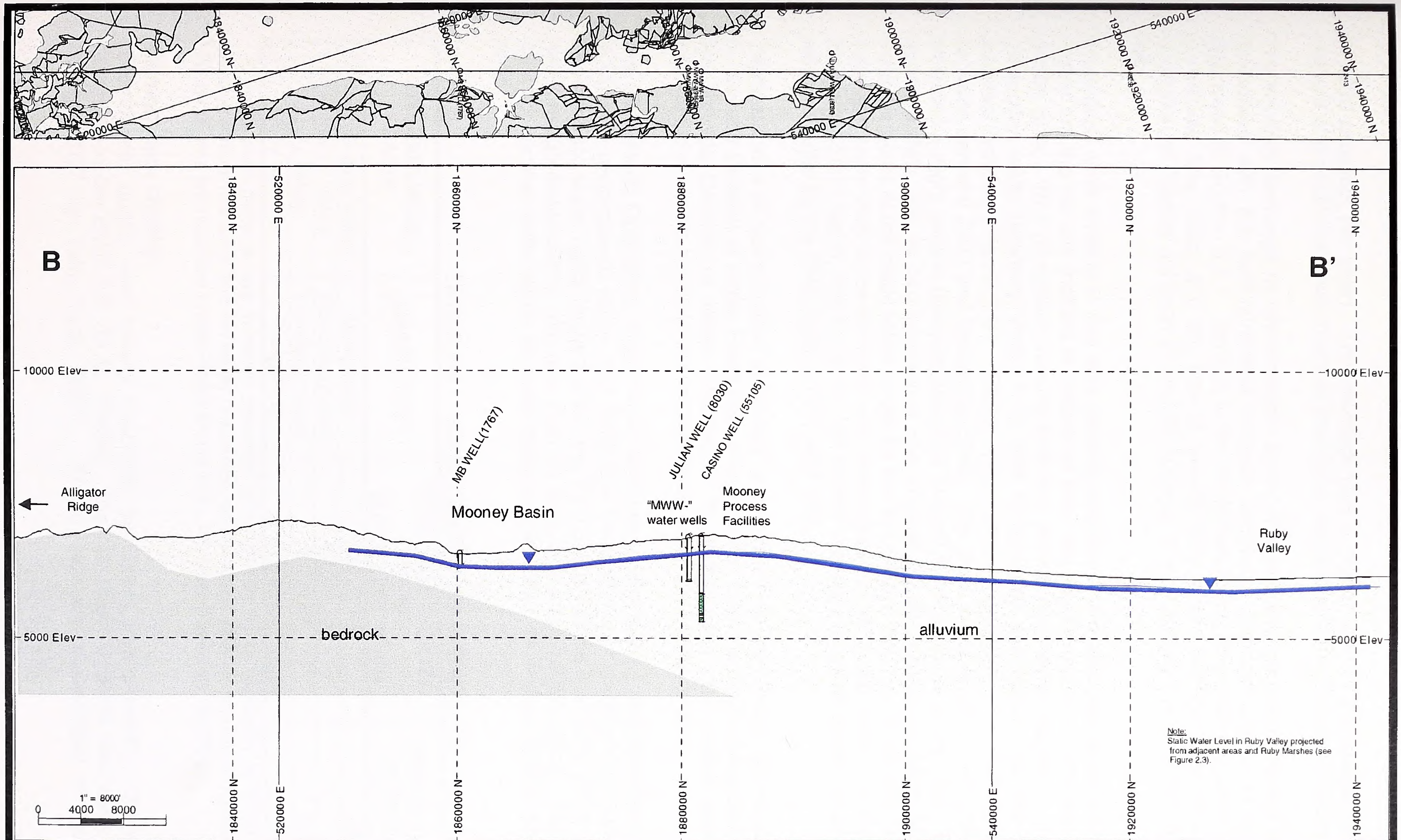
FIGURE 3-5

POTENTIOMETRIC SURFACE
CROSS-SECTION A



VERTICAL CROSS-SECTION B-B' (SW-NE). SEE FIGURE 3-4 FOR SECTION LOCATION. VERTICAL EXAGGERATION = 5X HORIZONTAL SCALE.

SOURCE: MINEMAPPERS LLC, 2007

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FIGURE 3-6
POTENTIOMETRIC SURFACE
CROSS-SECTION B

(19,000 acre-feet per year). This recharge rate is higher than in the valleys due to the larger amount of precipitation that occurs at the higher elevations in the Proposed Action area.

The aquifers discharge by two methods: spring flow and well pumping. Spring flow is primarily associated with the fault-controlled bedrock aquifers. The occurrence of spring flow was discussed in Section 3.2.1. Springs in the Proposed Action area average less than one-gallon-per-minute flow rates, and the flow is usually only active during spring snowmelt with the exception of Cracker Johnson #1 and #2 springs, which typically flow until late summer or early fall.

Production wells already in use with existing operations and also associated with the Proposed Action are the second method of discharge from the alluvial aquifer in and near the Proposed Action area. Well production occurs from the alluvial unconfined aquifers. There are three production wells (Mooney Wells 1, 2, and 3) currently associated with the Mooney Basin process facilities (Figure 3-4). These wells pumped approximately 832 acre-feet of water between January 2003 and December 2006. The static water levels in these three wells have indicated a slight decline (ranging from 8 to 13 feet) in water levels since 2003. This represents approximately one to two percent of the original aquifer thickness (Mine Mappers, 2007). Measurements of the static water levels for the two BMM production wells indicate no change in the static water level since the wells were constructed in 1983 and 1984. As stated in the Mine Mappers (2007) report, this suggests that aquifer recharge exceeds current production from the alluvial aquifer by the BMM wells on the west side.

There are also 36 wells located within and around the Proposed Action area that were reported by Nevada Division of Water Resources (Figure 3-4). There is no pumping data available from the Nevada Division of Water Resources for these wells and limited static water level information available to use in the description of the groundwater system.

The BMM North Operations Area Project is located within four hydrographic basins, and Barrick is the only underground water user within the BMM Plan of Operations boundary. There are three surface water rights located within the Plan of Operations boundary, all of which are stock water usage designations with less than 10 acre-feet annual adjudication. Table 3-5 lists the total adjudicated water rights for each hydrographic basin, as well as BMM's adjudicated water rights.

TABLE 3-5 ADJUDICATED WATER RIGHTS

HYDROGRAPHIC BASIN	BASIN TYPE[1]	TOTAL ADJUDICATED WATER (ACRE-FEET/YEAR)	BMM WATER RIGHTS[2] (ACRE-FEET /YEAR)
47 – Huntington Valley	Designated	24,413.95	559.46
154 – Newark Valley	Non-Designated	59,832.37	0
175 – Long Valley	Non-Designated	5,761.96	2,896.46
176 – Ruby Valley	Designated	499,344.31	0

[1] A designated basin is one in which permitted groundwater rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration.
[2] Water Rights are recorded under Placer Dome U.S., Inc (now owned by Barrick).

Groundwater Quality

Groundwater quality was initially described by Simon Hydro-Search (1994a) and is also described in the BMM EIS (BLM, 1995a). The data were updated with sampling from 2005 through 2007 by Tetra Tech (2007). These data are summarized in Table 3-6. The

TABLE 3-6 WATER QUALITY OF GROUNDWATER WELLS

PARAMETER (MG/L UNLESS OTHERWISE NOTED)	MOONEY BASIN WELL	MOONEY WELL 1				
	Q2 2007	Q4 2005	Q4 2005 (DUP)	Q1 2006	Q2 2006	Q4 2006
Alkalinity	130	103	103	114	112	103
Al	ND	0.01	0.02	0.07	ND	0.01
Sb	ND	ND	ND	<0.001	ND	ND
As	0.004	0.005	0.005	0.004	0.028	0.005
Ba	0.314	0.051	0.048	0.115	0.219	0.049
Be	ND	ND	ND	<0.001	ND	ND
HCO3	155	125	122	140	136	126
B	ND	0.05	0.05	0.058	0.068	0.025
Cd	ND	ND	ND	<0.001	ND	ND
Ca	37	44.3	42.8	42.2	27.3	39
CO3	2	ND	2	<1	ND	ND
Cl	16	21	17	14	14	13
Cr	ND	0.001	0.001	0.001	0.003	0.001
Cu	0.001	ND	ND	<0.001	ND	0.016
Cyanide WAD	ND	ND	ND	<0.005	ND	ND
Fl	0.2	0.2	0.2	0.2	0.1	0.3
Fe	0.02	0.03	0.02	0.18	0.02	0.07
Pb	ND	ND	ND	<0.001	ND	0.001
Mg	14	4.3	4.2	4.1	17.8	4
Mn	0.019	0.002	0.001	0.004	ND	0.007
Hg	ND	ND	ND	<0.0005	ND	ND
Ni	ND	ND	ND	0.002	ND	0.002
NO3-NO2-N	3.1	3.2	3.1	3.1	2.6	3.0
pH	8.32	7.90	8.36	8.29	7.95	7.96
K	6	7.1	6.9	5.7	5.3	7
Se	ND	0.002	0.002	0.003	0.003	0.003
SiO2	46.1	59.4	58.1	54.2	45.4	56.8
Ag	ND	ND	ND	<0.001	ND	ND
Na	9	11.5	11.2	10.1	8.3	10
TDS	227	242	233	231	219	239
SO4	9	18	17	18	22	21
Tl	ND	ND	ND	<0.0005	ND	ND
Zn	0.11	0.01	ND	0.02	ND	0.01

Note: Samples taken in 2005 and 2006 were analyzed for total metals. Samples taken in 2007 were analyzed for dissolved metals.

PARAMETER	MOONEY WELL 2						MOONEY WELL 3				
	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006	Q2 2007	Q4 2005	Q2 2006	Q3 2006	Q4 2006	Q2 2007
Alkalinity	130	122	112	127	124	128	120	112	121	124	130
Al	0.02	<0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sb	ND	<0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
As	0.004	0.003	0.004	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002
Ba	0.144	0.204	0.148	0.152	0.143	0.145	0.119	0.122	0.126	0.104	0.040
Be	ND	<0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
HCO3	155	146	136	155	151	156	143	136	147	151	159
B	0.05	0.060	0.074	0.06	0.028	ND	0.05	0.072	0.05	0.032	ND
Cd	ND	<0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ca	51.0	43.4	43.7	52.8	43	48	49.4	42.5	52.9	42	47
CO3	2	2	ND	ND	ND	ND	2	ND	ND	ND	ND
Cl	14	14	14	13	14	13	17	15	16	15	14
Cr	ND	<0.001	0.001	ND	ND	ND	ND	0.001	ND	ND	ND
Cu	ND	<0.001	ND	ND	ND	ND	ND	ND	ND	0.006	0.002
Cyanide WAD	ND	<0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fl	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	ND	0.2	0.2
Fe	0.11	0.02	ND	ND	0.02	ND	ND	ND	0.03	3.64	0.19
Pb	0.002	<0.001	ND	ND	ND	ND	ND	ND	ND	0.002	0.008
Mg	6.2	5.2	5.3	6.2	5	5	6.0	5.1	6.1	5	5
Mn	0.008	<0.001	ND	0.002	ND	ND	ND	ND	0.001	0.038	0.006
Hg	ND	<0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ni	ND	<0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
NO3-NO2-N	3.2	2.9	2.9	3.1	3.1	3.2	3.1	3.3	3.4	1.6	3.2
pH	8.34	8.35	8.03	8.10	8.04	8.00	8.40	8.03	8.02	8.02	7.86
K	5.7	4.8	5.7	5.7	5	5	6.0	6.1	6.1	6	7
Se	ND	<0.001	0.001	ND	ND	ND	ND	0.001	ND	ND	ND
SiO2	51.2	50.8	50.0	56.1	48.9	53.7	53.3	50.1	57.2	45.3	52.1
Ag	ND	<0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND
Na	12.2	11.6	12.1	13.0	10.0	10	12.2	11.6	13.0	11.0	14
TDS	248	229	231	253	247	243	248	237	257	244	247
SO4	16	15	21	16	15	16	17	25	18	18	21
Tl	ND	<0.0005	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zn	0.32	0.07	0.03	0.04	0.03	0.03	ND	ND	ND	ND	ND

Note: Samples taken in 2005 and 2006 were analyzed for total metals. Samples taken in 2007 were analyzed for dissolved metals.

PARAMETER	WELL 1					WELL 2					
	Q4 2005	Q1 2006	Q4 2006	Q4 2006 (DUP)	Q2 2007	Q4 2005	Q1 2006	Q2 2006	Q3 2006	Q4 2006	Q2 2007
Alkalinity	103	104	98	102	106	95	96	92	105	32	107
Al	0.01	<0.01	ND	ND	ND	ND	<0.01	ND	ND	0.02	ND
Sb	ND	<0.001	ND	ND	ND	0.001	0.002	ND	ND	ND	ND
As	0.015	0.018	0.017	0.018	0.017	0.035	0.056	0.003	0.027	0.045	0.015
Ba	0.372	0.398	0.390	0.391	0.393	0.229	0.356	0.169	0.226	0.363	0.171
Be	ND	<0.001	ND	ND	ND	ND	<0.001	ND	ND	ND	ND
HCO3	125	124	119	124	129	116	114	112	128	113	131
B	0.05	0.060	0.025	0.022	ND	ND	0.061	0.070	0.04	0.021	ND
Cd	ND	<0.001	ND	ND	ND	ND	<0.001	ND	ND	ND	ND
Ca	30.1	27.5	27	29	28	25.9	23.4	41.6	31.6	22	33
CO3	ND	2	ND	ND	ND	ND	2	ND	ND	ND	ND
Cl	31	32	31	31	31	28	25	31	32	24	34
Cr	0.002	0.001	0.001	0.002	0.001	0.007	0.001	ND	ND	0.002	0.003
Cu	0.003	0.008	ND	0.001	ND	ND	<0.001	ND	ND	0.023	ND
Cyanide WAD	ND	<0.005	ND	ND	ND	ND	<0.005	ND	ND	ND	ND
Fl	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.3	0.2
Fe	0.26	0.24	0.26	0.26	0.02	0.13	2.67	ND	0.02	3.34	ND
Pb	ND	<0.001	ND	ND	0.003	ND	0.003	ND	ND	0.917	ND
Mg	20.8	17.1	17	18	18	17.5	14.2	5.3	19.8	14	26
Mn	0.004	0.002	0.007	0.004	0.003	0.007	0.058	ND	0.003	0.230	0.001
Hg	ND	<0.0005	ND	ND	ND	ND	<0.0005	ND	ND	ND	ND
Ni	0.001	<0.001	ND	ND	ND	ND	0.001	ND	ND	0.005	ND
NO3-NO2-N	2.9	2.6	2.1	2.6	2.7	2.6	1.6	2.5	2.5	2.6	2.6
pH	7.82	8.38	8.11	8.11	8.13	7.88	8.50	8.03	8.13	8.16	8.05
K	4.8	5.0	5	5	6	9.3	6.3	5.5	5.4	9	5
Se	0.002	0.002	0.002	0.002	0.002	0.002	0.002	ND	ND	ND	0.002
SiO2	47.7	51.4	48.8	51.7	52.6	45.7	53.1	50.6	49.4	48.0	44.7
Ag	ND	<0.001	ND	ND	ND	ND	<0.001	ND	ND	ND	ND
Na	9.8	9.7	9	10	10	7.7	7.2	11.5	9.3	7	11
TDS	233	227	230	232	233	206	202	238	239	210	250
SO4	14	11	11	11	11	10	9	26	17	9	26
Tl	ND	<0.0005	ND	ND	ND	ND	<0.0005	ND	ND	ND	ND
Zn	0.04	0.02	0.02	0.01	0.02	0.02	0.10	0.04	0.02	0.83	0.01

Note: Samples taken in 2005 and 2006 were analyzed for total metals. Samples taken in 2007 were analyzed for dissolved metals.

groundwater is generally of good quality. The background arsenic levels observed in the aquifers are generally at or near applicable Nevada standards.

3.2.4 Groundwater Environmental Consequences

Proposed Action

Anticipated environmental impacts to groundwater resources include increased withdrawal of groundwater for processing and other uses, intersection of the water table by the open pits, and changes in the groundwater quality. Each of these anticipated impacts is described below.

The Proposed Action includes increasing the current groundwater withdrawal rates to accommodate the increased ore process facility capacity. The proposed groundwater withdrawal rates would be approximately 550 acre-feet per year, as compared with the current withdrawal rates of approximately 300 acre-feet per year, an increase of 250 acre-feet per year.

The groundwater at the BMM wells is obtained from an alluvial unconfined aquifer in the extreme southeast corner of Huntington Valley, which is a designated groundwater basin. The Mooney Basin wells obtain groundwater from an alluvial aquifer in Long Valley, which is an undesignated groundwater basin. There are no new production wells proposed in either Ruby or Newark valleys. There are no other permitted groundwater users within approximately five miles of the Proposed Action.

Based on an estimated recharge rate of approximately 19,000 acre-feet per year (Mine Mappers, 2007) to the alluvial aquifers in the Proposed Action area, there would be minimal impact to the aquifers. This conclusion is based on a proposed combined pumping rate of 550 acre-feet per year for the Proposed Action. This equates to approximately 2 percent of the estimated recharge rate to the aquifers in the Proposed Action area. The proposed increase in pumping rate would not impact any other users of the alluvial aquifer.

The area of influence around each production area was evaluated to determine whether the cone of depression for each pumping area would impact other permitted water users. A simulation was run using Darcy's Law and a constant pumping rate under steady-state conditions. The radius of the cone of depression was calculated using known hydrologic parameters for each pumping area. Each area was simulated utilizing only one well pumping at a time to replicate actual field conditions. Table 3-7 includes a list of inputs that went into the calculation along with the results.

TABLE 3-7 CONE OF DEPRESSION INPUTS AND RESULTS

PARAMETER	BMM WELLS	DATA SOURCE	MOONEY BASIN WELLS	DATA SOURCE
Pumping Rate	114 gallons per minute (184 acre-feet per year)	Barrick Staff[1]	228 gallons per minute (368 acre-feet per year)	Barrick Staff[1]
Saturated Aquifer Thickness	553 feet	Average of Bald-1 and Bald-2	496.5 feet	Average of MWW-2 and MW-3
Hydraulic Conductivity	1.56 feet per day	Average of Bald-1 and Bald-2	0.91 foot per day	Average of MWW-2 and MW-3
Hydraulic Gradient	0.02 foot per foot	Measured from Potentiometric Surface Map (Figure 3-4)	0.11 foot per foot	Measured from Potentiometric Surface Map (Figure 3-4)
Radius of Cone of Depression	202 feet	Calculated	138 feet	Calculated

[1] Zietlow, 2007e

As shown in Table 3-7, the radius of the cone of depression for the BMM wells on the west side of the Proposed Action area is approximately 200 feet. Since there are no other permitted water users within 200 feet of the BMM wells, there would be no projected impact to the water levels in nearby wells due to the proposed production on the west side of the property. The cone of depression extends approximately 140 feet from the Mooney Basin production wells on the east side of the property. These wells are also the only wells in the local vicinity; therefore no impacts to local water users are anticipated from the production of the Mooney Basin water wells. The springs in the area would not be impacted by the production at the water wells since they lie outside of the cone of depression. The pre-pumping water levels are also deep enough that impacts to any surface features within the cones of depression, such as surface vegetation, are not anticipated.

Based on groundwater studies, the open pits would not encounter the deeper groundwater aquifer, since the current pit configurations lie above the potentiometric surface (Mine Mappers, 2007). The pits may, however, encounter isolated occurrences of saturated material during excavation near clay zones. The amount of water that may be encountered in this scenario would most likely be minimal, and water would be pumped out of the open pit area as necessary to maintain safe operating conditions. Pumped water would be handled in a manner consistent with the BMM Water Pollution Control Permit. The rock within the open pits has been characterized as part of the on-going waste rock characterization program and has been shown to be primarily neutralizing in nature. The expansion of the open pits is anticipated to encounter the same rock types, and, therefore, no impact is expected from the perched water tables intersecting the open pit walls. Current operations have not indicated any detrimental effects from perched water entering pits.

Environmental impacts to groundwater quality due to the Proposed Action are not anticipated. There have been no impacts under the current operations, and the Proposed Action would include the continuation of mining similar rock types and processing ore in a similar manner, although the heap leach pads would be expanded to accommodate the additional ore. Characterization of the waste rock that has been encountered and is expected to be encountered under the Proposed Action is included in Section 3.2.2. The heap leach pads and process ponds would be double lined with leak detection systems. This would minimize the risk of process solution impacting groundwater. Final closure plans would also be designed and coordinated with the Nevada Division of Environmental Protection such that groundwater would not be impacted. The goal of closure would be no discharge of leach pad draindown fluids towards groundwater, but if this was not consistently achieved, closure plans would need to show that any water discharged would not adversely impact groundwater. This has been achieved at several leach pad closures within the mining district.

The open pits are not projected to impact groundwater quality, since there would be minimal exposed potential acid-generating material to generate acid that would infiltrate into the groundwater. The rock disposal areas are also not anticipated to impact the groundwater quality for the same reasons. BMM has collected and analyzed more that 1,600 waste rock samples for acid producing and metal leaching potential. These samples show due to the high carbonate content and oxidized nature of the rock, the waste rock would not leach waters that are high in acidity or metals content. BMM would continue to sample and monitor waste rock to evaluate if any unexpected material is encountered. No new rock types or sulfide deposits are anticipated as part of this Proposed Action, and Barrick proposes to continue the current approved waste rock management practice of comingling all waste rock material. Should any unanticipated sulfide/acid-generating material be encountered late in a mining sequence that would limit or preclude effective comingling, neutralizing waste rock from another mining area would be rehandled as necessary and placed both beneath and over sulfide material in a minimum of 50 foot thickness. Reducing or eliminating the exposure of potentially acid-generating material to air and water would minimize the risk of the potentially acid-generating material becoming oxidized, thus producing acid rock drainage. The heap leach facilities are not anticipated to impact groundwater quality, since they are currently double lined and all process fluids are controlled in a zero discharge system. This operation would continue under the Proposed Action. Groundwater quality would continue to be monitored on a routine basis, per the Water Pollution Control Permit, to identify potential changes to the groundwater quality during active operations and closure.

No indirect impacts are anticipated to either groundwater quality or groundwater quantity.

Alternative A – Partial Backfill Alternative
This alternative would include partial backfilling of up to six of the open pits, which reside above ambient groundwater levels. This would result in a reduction in approximately 434 acres of surface disturbance. The waste rock used to backfill the pits would be the same material placed in the rock disposal areas under the Proposed Action. This waste rock has been shown to be primarily neutral to neutralizing material. Any potentially acid-generating material would be encapsulated within the pit backfill, just as it would if it were found and placed on an above-grade rock disposal area. Based on these results, the impacts to groundwater quality and quantity would be the same as with the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative
This alternative would decrease groundwater withdrawal on the east side of the property; however, the usage on the west side of the property would increase due to the additional ore being processed on the 2/3 Heap Leach Pad. There would be a reduction in surface disturbance of approximately 105 acres. The total groundwater production (550 acre-feet per year) across the Proposed Action would remain the same since the same amount of ore would be processed. However, under this alternative the water would be pumped from the wells on the west side of the property in Huntington Valley instead of being pumped from Mooney Basin, which is located in Long Valley. Overall, water needs from Long Valley, a non-designated aquifer, would decrease while water needs from Huntington Valley, a designated aquifer, would increase. There would be no anticipated impacts to groundwater quality with implementation of Alternative B. Closure requirements would be the same as for the Proposed Action. The leach pads are designed with leak detection systems and are constructed to have no discharge; therefore, the alternative leach pad scenario would have no impact on groundwater quality.

No Action Alternative
This alternative would result in the cessation of mining in 2009. No additional development of the water resources by Barrick would occur. The impacts to groundwater quantity and quality would be the same as those previously identified in the 1995 EIS and subsequent NEPA documents.

3.3 Geology and Minerals

Mining has occurred in the Bald Mountain area since 1869 (Hose and Blake, 1976). Copper, antimony, silver, and gold ores were mined next to a small granitic intrusion south of Big Bald Mountain. Bulk mineable gold deposits were first discovered in 1976 at the Alligator Ridge mine just south of the Bald Mountain District. Modern exploration in the Bald Mountain Mining District began between 1976 and 1980 and has continued to the present. Two types of gold deposits are recognized: Eocene-aged Carlin-style deposits in Mooney Basin and the Jurassic-aged intrusion-related gold deposits near Bald Mountain. The Mooney Basin gold mineralization is confined to Devonian- through Mississippian-aged carbonate and siliciclastic formations (416 million years to 318 million years before present). Radiometric dating and geologic relationships indicate that Mooney Basin gold mineralization is mid-Eocene in age (40 to 35 million years before present).

The Jurassic intrusion-related gold deposits at the mine site, such as at Top Pit and Sage Flats, are primarily hosted in Middle Cambrian through Ordovician carbonate rocks (510 to 444 million years) and the Jurassic porphyritic dikes, sills, and stocks that intrude them. Radiometric dates on porphyritic intrusions closely associated with gold ore indicate an igneous age of 159 million years. The gold mineralization is most likely slightly younger but still late Jurassic.

Mining within the Bald Mountain Mining District since 1980 has occurred in five areas encompassing 26 open pits, 30 rock disposal areas, 10 heap leach pads, and seven associated process ponds.

Assumptions for Analysis
The assumption made for the geology and minerals analysis is the following:

- Current information accurately describes the geology and ore deposits of the area.

3.3.1 Geologic and Mineral Resources Affected Environment

Regional Geology

During Paleozoic times, the Proposed Action area was covered by a shallow sea that was adjacent to the western margin of the North American plate in early Paleozoic times. Carbonate and siliciclastic sediments were deposited at the bottom of the sea. Folding and faulting of the sediments during the Antler and Sonoma Orogenies were followed by intrusions of igneous rocks and associated volcanic deposits. Low-angle, extensional faulting was followed by high-angle, normal faulting. Mineralization is thought to have occurred along these high angle faults. Following mineralization, the Basin and Range faulting and subsequent erosion have created the land forms currently seen in the area (Stewart, 1980).

Local Geology

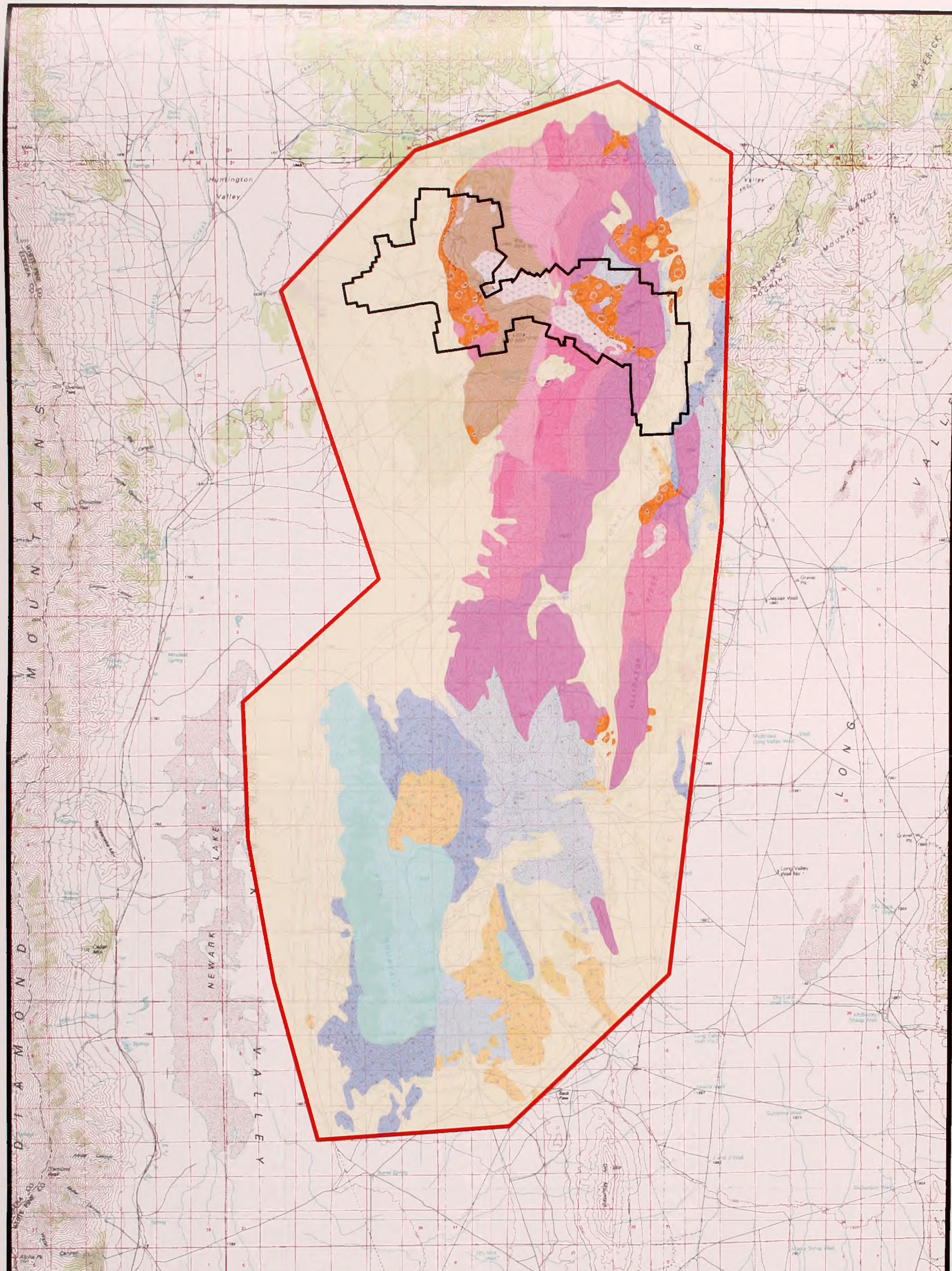
The following sections describe the local geologic features. Figure 3-7 shows the surface geology of the Proposed Action area and cumulative effects area.

Stratigraphy

Figure 3-1 of the BMM EIS (BLM, 1995a) summarizes the stratigraphic column for the Proposed Action area. Paleozoic carbonate and siliciclastic sediment rock types in the Proposed Action area include limestone, dolomite, shale, siltstone, and sandstone. These Paleozoic sedimentary rocks were primarily formed in a shelf or shallow marine environment. The Jurassic-aged felsic stocks, dikes, and sills have intruded and locally metamorphosed the Paleozoic sediments. Eocene to Miocene volcanic flows, tuffs, coeval sediments, and occasional dikes are preserved in grabens in and near Mooney Basin. Quaternary alluvial sediments fill the modern valleys and basins.

Mooney Basin gold deposits are typically found in Guilmette Limestone and overlying Pilot Shale. Mineralization is most commonly found along the contact between the two formations, often concentrated in the lower 300 feet of the Pilot Shale.

The Top Pit-Sage Flats and related gold deposits preferentially occur in Cambrian to Ordovician limestone and dolomite, including the Late Cambrian Upper Hamburg and Upper Windfall Formations, and the Ordovician Pogonip Group limestone. Mineralization is closely associated with the Jurassic intrusives.



Legend

- North Operations Project Boundary
- Geology Cumulative Assessment Study Area
- IPMcl - Shale, siltstone, sandstone, and conglomerate (Middle Pennsylvanian to Lower Mississippian)
- br - Mixed breccias including volcanic, thrust, jasperoid, and landslide megabreccia (Tertiary to Jurassic)
- Ts3 - Younger tuffaceous sedimentary rocks (Pliocene and Miocene)
- Tr1 - Older rhyolitic flows and shallow intrusive rocks (lower Oligocene to middle Eocene)
- Tfi - Felsic phaneritic intrusive rocks (Miocene to Eocene)
- Ta1 - Older andesite and intermediate flows and breccias (lower Oligocene to middle Eocene)
- SOc - Dolomite, limestone, and shale (Lower Silurian to Middle Ordovician)
- Qpl - Playa, lake bed, and flood plain deposits
- Qal - Alluvium, undifferentiated
- Psc - Siltstone, sandstone, limestone, and dolomite (Lower Permian, Leonardian and Wolfcampian)
- PIPc - Limestone, dolomite, siltstone, sandstone, and shale (Lower Permian and Pennsylvanian)
- OCc - Limestone, dolomite, and quartzite (Middle Ordovician to Upper Cambrian)
- MDcl - Siltstone, limestone, shale, and sandstone (Lower Mississippian and Upper Devonian)
- Dcd - Dolomite, sandstone, and limestone (Middle and Lower Devonian)
- Dc - Limestone and minor dolomite (Upper and Middle Devonian)
- Cc - Dolomite, limestone, and shale (Cambrian)

SOURCE: USGS GEOLOGIC MAP, I2691
ftp://nas.library.unr.edu/keck/31901nvgeolmapmd/usgs_i2691.zip

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT DEIS

FIGURE 3-7

GEOLOGIC MAP

Figures 2-8, 2-9, 2-10, and 2-11 show schematic cross-sections through most of the open pits in the Proposed Action area.

Structure
Local geologic structure is dominated by post-ore north-south trending Basin and Range normal faults that separate mountain ranges from valleys. Along with the north-south faults, there are several sets of older northwest and north-northeast trending high angle normal faults within the mountain ranges that control Jurassic intrusion patterns and localize gold mineralization.

Paleozoic rocks were folded and faulted during the Antler and Sonoma orogenies. Uplift-related faulting that trended northwest, east-west, and north-northeast followed the folding. Geologic relationships indicate the approximate minimum age of much of the high-angle faulting as Jurassic. The north-trending Basin and Range faults intersect and displace the older faults. Additional discussions on the local geologic and structural setting in the mining district can be found in the BMM EIS (BLM, 1995a).

Mineral Resources
Gold deposits within the BMM and Mooney Basin areas are primarily classified as carbonate, sediment-hosted disseminated gold mineralization with minor amounts of silver. The Mooney Basin gold mineralization is controlled by two major features, the high-angle northwest and northeast trending faults and the contact between Guilmette Limestone and overlying Pilot Shale. The mineralization is, in many instances, concentrated along faults or at the intersections of the faults.

The older intrusion-related gold mineralization in the Top Pit area is hosted by Cambrian to Ordovician limestone and dolomite and is associated with Jurassic felsic intrusions, also favoring sites at intersecting northwest and north-northeast high-angle faults.

The gold deposits throughout the mining district were formed by hydrothermal fluids, which circulated along faults and lithologic contacts. Fluid circulation leached calcite from portions of the Paleozoic carbonate rocks and introduced silica, pyrite, and gold.

In most of the Mooney Basin deposits, gold ore is located within the lower 300 feet of the Pilot Shale and the uppermost portions of the Guilmette Limestone. In the Top Pit area, the ore is located in both the altered felsic intrusions and in the fractured and locally metamorphosed carbonate rocks adjacent to the intrusions. In the Alligator Ridge area, gold mineralization is Eocene in age as it also is likely for many of the Mooney Basin deposits. Gold ore in Top Pit and in the other deposits in the northwest portion of the BMM district is closely associated with Jurassic (159 million years) intrusions that likely predate the gold deposits by a few million years.

From 1980 to 2006, approximately 400 million tons of resource (80 million tons of ore and 320 millions tons of waste) were mined. A total of approximately two million ounces of gold has been produced through August 2007 at the BMM and Mooney Basin Operations Area.

Mineral Material Resources
There are abundant resources of sand and gravel in the alluvium throughout the Proposed Action area.

Oil and Gas Resources
Oil and gas resources have been identified in Newark and Long valleys. Two types of oil and gas targets are found in the area: unconformity targets where a structural trap is sealed by

volcanics, and upper Paleozoic targets where there is a stratigraphic trap between the Diamond Peak Formation and the Chainman Shale. Oil also occurs in the Pilot Formation at the Yankee Mine and in an oil well located in Long Valley. Potential resources are estimated at 97 million barrels of oil and 59 billion cubic feet of gas (BLM, 1995a).

Seismic Activity
The Great Basin is tectonically active, evidenced by recent seismic activity as shown in Figure 3-8. A search was conducted within a 100-mile radius of the Proposed Action area to determine historic earthquakes (UNR, 2007). The strongest reported earthquake in the last 200 years was in 1872 (magnitude 6.0), approximately 82 miles west of the Proposed Action area. The area has been classified as a Zone II seismic risk area (NOAA, 1973). A Zone II classification means that moderate damage is possible from the maximum credible earthquake. Moderate earthquake damage includes damage to masonry, weak chimneys falling, falling plaster, loose bricks, stones, tiles and cornices, and small slides and cave-ins along gravel banks.

Since the above records search was conducted, a 6.0 earthquake occurred on February 21, 2008, with an epicenter located approximately 11 miles southeast of the town of Wells, Nevada, approximately 85 miles north northeast of the Proposed Action. Although the earthquake was felt by some employees, no damage was observed at any of the facilities following thorough inspections by site personnel.

An evaluation of the stability of the 2/3 Heap Leach Pad was conducted by AMEC in 2000 (AMEC, 2000). The analysis indicated that the 2/3 Heap Leach Pad, which is constructed on alluvial material, would safely withstand the operational base earthquake which was assumed to be a 10 percent, 100-year event. The buildings on-site were not designed to a specific seismic standard; however, they are inspected following any seismic event felt at the site.

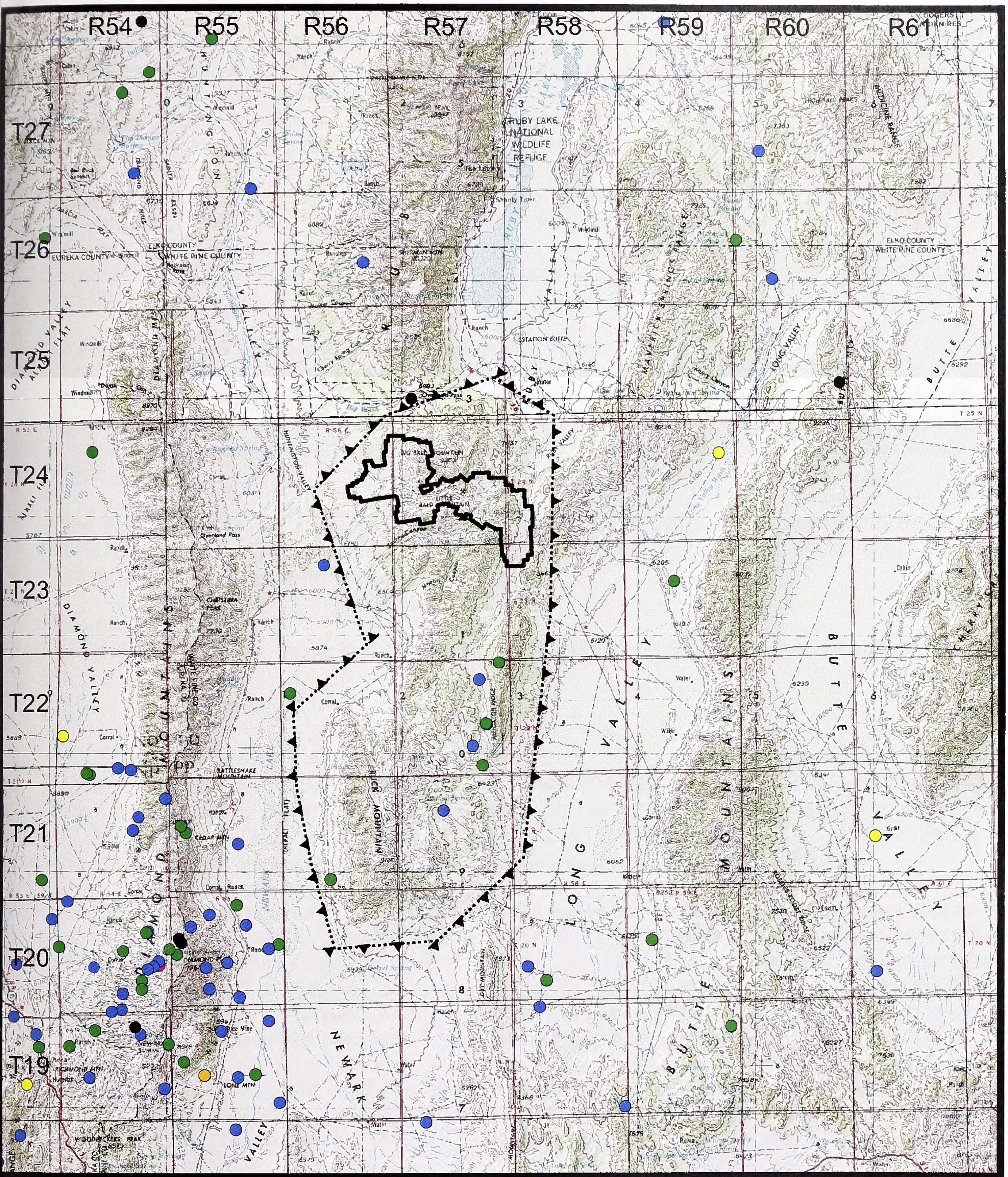
Existing Surface Disturbance
Existing surface disturbance associated with the BMM is discussed in Section 2.2.

3.3.2 Geologic and Mineral Resources Environmental Consequences

Proposed Action
Direct impacts to geologic and mineral resources from the Proposed Action include removal of ore from the open pits and burial of surficial material under waste dumps and process facilities. No other impacts to geologic resources are anticipated. The Proposed Action would not directly impact any oil and gas resources within or adjacent to the Proposed Action area. The amounts of material to be mined are discussed below. Present occurrences of mineral materials would be removed or buried, but the amount of these lost through the Proposed Action would be inconsequential compared with other available sources. Waste dumps would contain new sources of decorative rock.

Approximately 1,030 million tons of material would be mined under the Proposed Action. Approximately 200 million tons would be ore, and 830 million tons would be waste rock.

Proposed expansion of the existing rock disposal areas and leach pads and development of new rock disposal areas are not anticipated to impact any economically recoverable gold resources. Condemnation drilling would verify that there is no economic resource located beneath proposed facilities. The expansion of the Mooney Basin Heap Leach Pad would also not affect any known recoverable mineral resources.



Legend

- North Operations Project Boundary
- Cumulative Assessment Study Area for Geology, Minerals, Paleontology, Noise and Vibration
- Magnitude 0 - .99
- Magnitude 1 - 1.99
- Magnitude 1.99 - 2.99
- Magnitude 2.99 - 3.99
- Magnitude 3.99 - 4.99
- Magnitude 4.99 - 5.99

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BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-8
HISTORIC SEISMIC ACTIVITY

Alternative A – Partial Backfill Alternative
This alternative would include partial backfilling of up to six open pits. This would lead to less surface disturbance (approximately 434 acres); however, the impact to mineral resources would remain the same as with the Proposed Action, since the open pits would still be mined to the same configuration. Backfill of some of the pits would not impact future precious metal resources as these would be fully explored before backfill activities. Table 2-15 lists the modifications that would be made to the tonnage of materials moved under the Partial Backfill Alternative. The total tonnage of material mined would remain the same; the location of disposal, rock disposal area, or backfill is the only difference from the Proposed Action. Approximately 434 acres of surficial geologic material would not be covered by waste dumps and leach pads.

Alternative B – Mooney Basin Heap Leach Pad Alternative
This alternative would require processing of the ore at the BMM 2/3 heap leach pad. With the Mooney Basin Heap Leach Pad redesigned to a smaller configuration under this alternative (Figure 2-13), the ore would be processed on the existing 2/3 Heap Leach Pad. The 2/3 Heap Leach Pad expansion would result in approximately 14 acres of new disturbance, as described in Section 2.5.3.

The impacts on the geologic and mineral resources would be as described for the Proposed Action, since the level of mining would remain the same; the only difference would be the location where the ore is processed.

No Action Alternative
No impacts other than those already disclosed in the BMM 1995 EIS would occur.

3.4 Paleontology

3.4.1 Paleontology Affected Environment
Although invertebrate fossils (including trilobites) are plentiful in the Ruby Mountains, no fossils have been found in the Proposed Action area that have been classified as rare or important (BLM, 1995a). In fact, the presence of fossils is uncommon in the vicinity of the Proposed Action area, most likely due to the regional metamorphic activity (BLM, 1995a).

The fossils that have been found are generally algae and invertebrates from the Cambrian period (570 to 500 million years before present). Ordovician, Silurian, and Devonian sediments include the Laketown Dolomites, which contain waterflea fossils. Mississippian sediments (Joana Limestone) found on the eastern flank of the Proposed Action area have been discovered to have fragments of echinoderms (marine animals), bryozoans (sea mosses), foraminiferans (one-celled aquatic animals), and algae (Hose and Blake, 1976).

The Mooney Basin area contains older volcanic and sedimentary rocks with ostracods (crustaceans) and freshwater gastropods (terrestrial molluscs) from 53 to 37 million years before present (Eocene age).

3.4.2 Paleontology Environmental Consequences
Proposed Action
No impacts to paleontological resources of scientific or educational value are anticipated as part of the Proposed Action because none are known to be present in the Proposed Action area. One of the project's Design Features (Table 2-13) and a BLM Best Management Practice (Appendix D) is to immediately bring to the attention of the BLM Authorized Officer any paleontological resources of potential scientific interest (including all vertebrate fossils and

deposits of petrified wood) that might be encountered during mine operations. Any direct impacts to paleontological resources would be limited to the areas of disturbance.

Alternative A – Partial Backfill Alternative
This alternative would include partial backfilling of some of the open pits. This would lead to approximately 434 acres less surface disturbance; however, the impact upon the paleontological resources would remain the same as with the Proposed Action, since the open pits would still be mined to the same configuration.

Alternative B – Mooney Basin Heap Leach Pad Alternative
This alternative would not impact paleontological resources, since the mining extent would be the same as with the Proposed Action. The only difference under this alternative would be where the ore would be processed and the size of the leach pad, and this would have no effect on paleontological resources.

No Action Alternative
Under this alternative, mining under the current permits would cease in 2009. No impacts other than those already disclosed in the BMM 1995 EIS would occur.

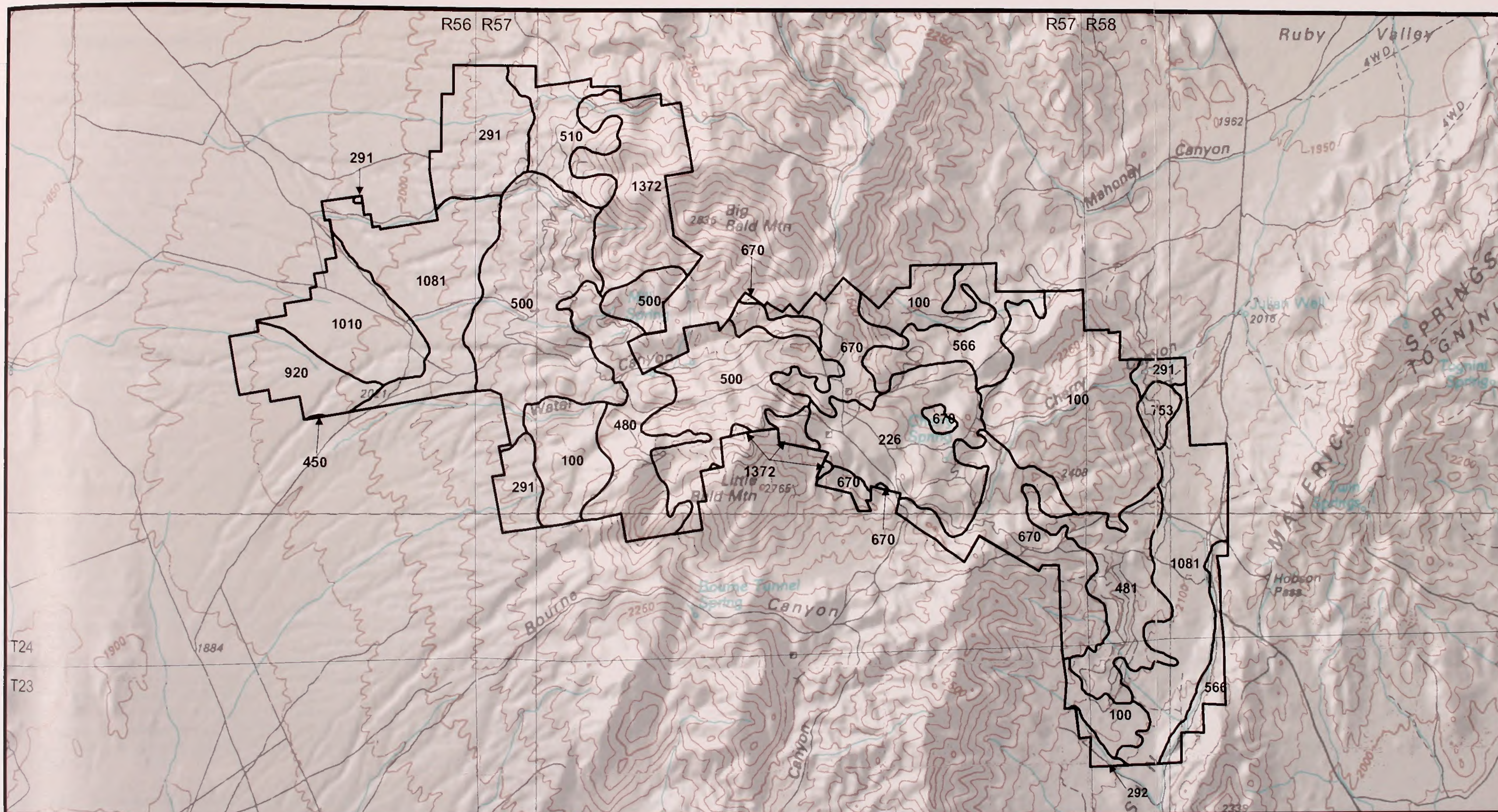
3.5 Soils

Assumptions for Analysis
Assumptions made for the soils analysis include the following:

- Waste rock and salvageable soil material would not be mixed; and
- Depths of suitable growth medium were assumed to be restricted to material above bedrock or duripan layers and to materials not characterized by extremely gravelly, stony, or cobbly soil profiles.

3.5.1 Soils Affected Environment
Based on a Natural Resource Conservation Service Soil Survey, 16 soil associations are present within the Proposed Action area (Figure 3-9). Descriptive and interpretive data for each soil association was derived from the *Soil Survey of Western White Pine County, Nevada* (NRCS, 1998). This information was used in conjunction with the Natural Resource Conservation Service range site descriptions in order to identify and correlate soil associations with vegetation types within the Proposed Action area. The soils data summarized in Table 3-8 include:

- Soil association name and map number;
- Average soil depth ranges for each soil association;
- Average salvageable growth medium depth ranges for each soil association;
- Soil texture in the surface layer;
- Erosion hazard;
- Factors that may limit reclamation potential (e.g., steep slopes, shallow depths to bedrock or duripan, high percentage of coarse fragments near the surface, clay texture, high alkalinity, high erosion hazard); and



Legend

North Operations Project Boundary

Association Boundaries

Soil Associations

100 = Pookaloo-Cavehill-Rock outcrop
226 = Hutchley-Tusel-Suak
291 = Urmafot-Borvant-Biken
292 = Palinor-Urmafot
450 = Shabliss-Yody Association
480 = Pioche-Cropper
481 = Pioche-Segura-Cropper
500 = Segura-McIvey-Hutchley
510 = Onkeyo-Cavehill Pookaloo
566 = McIvey-Segura-Cropper
670 = Cavehill-Grink-Rock Outcrop
753 = Upatad-Cropper-Atlow
920 = Abgese-Yody-Shabliss
1010 = Hunnton-Chiara
1081 = Bobs-Fax-Parisa
1372 = Wardbay-Hardol-Adobe

N

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BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-9
SOIL MAP

- Suitability for reclamation.

Soil varies in depth, quality, and quantity across the Proposed Action area. In general, all soils in the Proposed Action area are shallow loams and silty loams with a high coarse fragment percentage (e.g., gravelly, cobbly, stony) throughout the soil profile and occur on moderately steep to steep slopes (8 to 50 percent). The Abgese-Yody-Shablise and Hunnton-Chiara soil associations support the big sagebrush vegetation type dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). Mountain big sagebrush (*Artemisia tridentata vaseyana*) is more commonly found on Segura, Bobs, Fax, Parisa, and McIvey soils within the Proposed Action area. The Bobs-Fax-Parisa soil association supports the big sagebrush vegetation type dominated by big basin sagebrush (*Artemisia tridentata* ssp. *tridentata*). The Hutchley soil supports low sagebrush (*Artemisia arbuscula*), and Segura and Tusel soils occur within mixed shrub vegetation. The Grink soil type supports the mountain mahogany vegetation type associated with rock outcrops on summits and mountain side slopes. Pinyon-juniper vegetation communities generally occur on Cavehill, Cropper, and Pioche soils (BLM, 1995a), and the Pookaloo soil supports the pinyon-juniper vegetation type dominated by Utah juniper (*Juniperus osteosperma*).

Suitable growth medium is restricted to material lying above duripan layers, material above bedrock, and material that is not extremely gravelly, stony, or cobbly (BLM, 1995a). Soil suitability evaluations are summarized in Table 3-8 and indicate the average depth of salvageable growth medium that may be encountered for each soil. Salvageable growth medium depths vary by site-specific locations but are generally the average maximum obtainable depths based upon limiting factors in each soil unit. The depth range corresponds to the variability of soil characteristics among the soil series designated for a specific soil association. Depth of salvageable growth medium for reclamation was determined for each soil series within a particular soil association.

The physical and chemical properties of soils were evaluated to identify factors that may limit successful reclamation (BLM, 1995a). The following properties are considered unsuitable criteria when determining what soils are suitable growth medium: greater than 60 percent clay, less than 0.5 percent organic matter content, greater than 35 percent coarse material by volume, salinity values greater than 15 milliohms per centimeter, greater than 15 percent sodium adsorption ratio, pH values less than 4.5 and greater than 9.0, calcium carbonate content greater than 40 percent, and slope steepness greater than 40 percent (USDA, 1993).

Approximately 91 percent of the Proposed Action area contains soil associations characterized as extremely stony, very gravelly, very cobbly, or very stony material. Salvageable soil depths within the Proposed Action area range from 0 to 60 inches, and most soil associations can produce between 4 and 60 inches of salvageable growth medium. With the exception of the gently sloping alluvial fans at the lower elevations, most soils within the Proposed Action area have slopes of 15 percent or greater, which increases the potential for accelerated erosion (see Table 3-8).

3.5.2 Soils Environmental Consequences

Proposed Action

Anticipated environmental impacts to soil resources include the potential loss of productive topsoil in disturbed areas, increased wind and water erosion, and potential of contamination of soils from spills of chemicals during transportation, storage, and use. Anticipated impacts are described below.

The 16 soil associations identified within the Proposed Action boundary are summarized in Table 3-8. Of the 16 soil associations, 14 account for the proposed 3,920 acres of disturbance. Acreages were calculated using the soil map units provided by the Natural Resource Conservation Service (NRCS, 1998). Soil associations located within the Proposed Action boundary that would not be disturbed include the Palinor-Urmafot-Urmafot, very shallow, and the Shabliss-Yody association. Approximately 7.3 to 11.7 million cubic yards of growth medium would be available for salvage from the 3,920 acres of proposed disturbance. This is adequate to cover 3,920 acres of reclamation.

Growth medium would be salvaged wherever possible and reused in the area where it was salvaged. Where sufficient growth medium material is available, a minimum of six inches would be placed during reclamation. However, it is possible that some areas may not contain sufficient amounts of growth medium for reclamation. The volume of salvageable growth medium could be limited by shallow soils or soils with high percentages of coarse fragments and consequently may not provide six inches of growth medium for revegetation as specified in the reclamation plan. In such cases, all available salvaged material would be placed above waste rock and the area ripped to achieve six inches of loosened aggregate material for plant growth. Results from the test plot program would provide a measure of the effectiveness of practices employed during reclamation, including the need for amendments that could be added to growth medium on waste rock areas (BLM, 1995a). To date, Barrick has been successful at concurrent reclamation of facilities using salvaged topsoil methods described above. Successful reclamation practices currently used at the mine would continue to be used for future reclamation.

Construction and mining activities would temporarily impede soil development, including soil structure and horizonization (profile) development. Soil biological activity (especially with mycorrhizea-root association) and nutrient cycling would be substantially reduced or eliminated during stockpiling as a result of anaerobic conditions created in deeper portions of the stockpiles. After soil redistribution, biological activity would slowly increase, eventually reaching pre-salvage levels. Placement of soil over waste rock would change the character and texture of the original soil profiles. As new soil profiles develop over time, the original character of the native soil would be permanently changed (BLM, 1995a).

Reclamation vegetation rooting depth and the soil's available water-holding capacity may be limited in the six inches of growth medium. Ripping or otherwise loosening compacted surfaces prior to placement of growth medium and revegetation, as proposed, would aid in reclamation by reducing the interface between the compacted surface and growth medium, increasing the rooting depth and water-holding capacity of the growth medium at the reclaimed site. For details on reclamation, see the BMM Plan of Operations (BMM, 2009).

Exposure and disturbance of soils could increase the potential for accelerated soil erosion from sites affected by construction. Excavation, transportation, and placement of growth medium also could promote the breakdown of soil aggregates into loose soil particles, increasing the potential for wind and water erosion of stockpiled soils. Blading and/or excavation of remaining subsoil materials to achieve desired grades and soil conditions for the facilities could result in steeper slopes on exposed soils, mixing of soil materials, and the additional breakdown of subsoil aggregates. As proposed in the reclamation plan, and consistent with existing practices at BMM, measures to stabilize and protect growth medium stockpiles and embankments, such as protected stockpile locations and stockpile seeding, would be implemented to minimize soil loss and limit disturbance to soils on-site. Additionally, the establishment of a temporary vegetative cover may aid in reestablishing biological activity in the soil. Reclaimed areas would be susceptible to erosion until the site naturally stabilizes over time.

TABLE 3-8 SUMMARY OF SOILS IN THE PROPOSED ACTION AREA

Soil Map Unit	Soil Assoc.	Soils	Depth to Duripan (in)	Depth to Bedrock (in)	Slope (%)	Surface Layer Rock Fragments (%)	Surface Layer pH	Restrictions[1]	Water Erosion Hazard	Wind Erosion Hazard	Suitability for Reclamation[2]
100	Pookaloo-Cavehill-Rock outcrop assoc.	Pookaloo very gravelly loam		14-20	15-50	0-5	7.9-8.4	Depth to rock, slope	Moderate	Slight	Poor
		Cavehill very gravelly silt loam,		20-40	15-50	0-15	7.9-9.0	Slope, high pH	Slight	Slight	Poor
		Rock outcrop						N/A			Not rated
226	Hutcliney-Tusel-Suak assoc.	Hutcliney very gravelly loam		10-20	15-50	5-15	6.6-7.8	Depth to rock, slope	Slight	Slight	Poor
		Tusel cobbly loam		40-60	15-50	15-35	6.1-7.3	Slope, excess stones	Moderate	Slight	Well suited
		Suak very stony loam		20-40	8-30	40-55	6.6-7.3	Slope, excess stones	Slight	Slight	Poor
291	Urmafot-Borvant-Biken assoc.	Urmafot very gravelly loam	9-20		2-8	0	7.9-8.4	Depth to restrictive layer	Slight	Slight	Poor
		Borvant gravelly loam	10-20		4-15	0-10	7.4-9.0	Depth to restrictive layer, high pH	Slight	Slight	Poor
		Biken very gravelly fine sandy loam	14-20		8-30	0-10	8.5-9.0	Depth to restrictive layer, slope, high pH	Slight	Slight	Poor
292	Palinor-Urmafot-Urmafot assoc.	Palinor gravelly loam	14-20		8-15	0-10	7.9-9.0	Depth to restrictive layer, high pH	Slight	Slight	Poor
		Urmafot very gravelly loam	9-20		2-8	0	7.9-8.4	Depth to restrictive layer	Slight	Slight	Poor
		Urmafot gravelly loam, very shallow	9-20		4-15	0	7.9-8.4	Depth to restrictive layer	Slight	Slight	Poor

Soil Map Unit	Soil Assoc.	Soils	Depth to Duripan (in)	Depth to Bedrock (in)	Slope (%)	Surface Layer Rock Fragments (%)	Surface Layer pH	Restrictions[1]	Water Erosion Hazard	Wind Erosion Hazard	Suitability for Reclamation[2]
450	Shabliss-Yody assoc.	Shabliss gravelly loam	10-20		2-8	0	7.9-8.4	Depth to restrictive layer	Slight	Slight	Poor
		Yody gravelly sandy loam	30-40		2-8	0-5	7.9-8.4	None	Slight	Slight	Suited
480	Pioche-Cropper assoc.	Pioche extremely stony loam		6-15	15-50	15-55	6.6-7.8	Depth to rock, slope, excess stones	Moderate	Slight	Poor
		Cropper very cobbly loam		14-20	15-50	20-40	6.6-7.8	Depth to rock, slope excess stones	Moderate	Slight	Poor
481	Pioche-Segura-Cropper assoc.	Pioche extremely stony loam		6-15	15-50	15-55	6.6-7.8	Depth to rock, slope, excess stones	Moderate	Slight	Poor
		Segura very cobbly loam		7-14	8-30	30-45	6.6-8.4	Depth to rock, slope, excess stones,	Slight	Slight	Poor
		Cropper very cobbly loam		14-20	8-30	20-40	6.6-7.8	Depth to rock, slope, excess stones	Slight	Slight	Poor
500	Segura-McIvey-Hutcliney assoc.	Segura very cobbly loam		7-14	15-50	30-45	6.6-8.4	Depth to rock, slope, excess stones	Moderate	Slight	Poor
		McIvey very gravelly loam		>60	30-50	0-10	6.6-7.3	Slope	Slight	Slight	Poor
		Hutcliney very gravelly loam		10-20	8-30	5-15	6.6-7.8	Depth to rock, slope	Slight	Slight	Poor
510	Onkeyo-Cavehill-Pookaloo assoc.	Onkeyo very gravelly silt loam		10-20	15-50	0-15	7.4-8.4	Depth to rock, slope	Slight	Slight	Poor
		Cavehill very gravelly silt loam		20-40	15-50	0-15	7.9-9.0	Slope, high pH	Moderate	Slight	Poor
		Pookaloo very gravelly loam		14-20	15-50	0-5	7.9-8.4	Depth to rock, slope	Moderate	Slight	Poor

Soil Map Unit	Soil Assoc.	Soils	Depth to Duripan (in)	Depth to Bedrock (in)	Slope (%)	Surface Layer Rock Fragments (%)	Surface Layer pH	Restrictions[1]	Water Erosion Hazard	Wind Erosion Hazard	Suitability for Reclamation[2]
566	McIvey-Segura-Cropper assoc.	McIvey gravelly loam		>62	15-50	0-10	6.6-7.3	Slope	Moderate	Slight	Suited
		Segura very cobbly loam		7-14	15-50	30-45	6.6-8.4	Depth to rock, slope, excess stones	Moderate	Slight	Poor
		Cropper very cobbly loam		14-20	15-50	20-40	6.6-7.8	Depth to rock, slope, excess stones	Moderate	Slight	Poor
670	Cavehill-Grink-rock outcrop assoc.	Cavehill very gravelly silt loam		20-40	15-50	0-15	7.9-9.0	Slope, high pH	Moderate	Slight	Poor
		Grink very stony loam		14-20	15-50	25-50	7.4-8.4	Depth to rock, slope, excess stones	Moderate	Slight	Poor
		Rock outcrop						N/A	Moderate	Slight	Not rated
753	Upatad-Cropper-Atlow assoc.	Upatad very gravelly silt loam		14-20	15-50	0	7.4-7.8	Depth to rock, slope	Moderate	Slight	Poor
		Cropper very cobbly loam		14-20	15-50	20-40	6.6-7.8	Depth to rock, slope, excess rock	Moderate	Slight	Poor
		Atlow very gravelly loam		14-20	15-50	0-15	7.4-8.4	Depth to rock, slope	Moderate	Slight	Poor
920	Abgese-Yody-Shabliss assoc.	Abgese sandy loam		>62	2-4	0-5	7.9-8.4	None	Slight	Slight	Suited
		Yody gravelly sandy loam	30-40		2-4	0-5	7.9-9.0	None	Slight	Slight	Suited
		Shabliss gravelly loam	10-20		2-4	0	7.9-8.4	Depth to restrictive layer	Slight	Slight	Poor
1010	Hunnton-Chiara assoc.	Hunnton silt loam	20-40		2-8	0	7.4-8.4	None	Slight	Slight	Suited
		Chiara silt loam	10-20		2-8	0	6.6-8.4	Depth to restrictive layer	Slight	Slight	Poor

Soil Map Unit	Soil Assoc.	Soils	Depth to Duripan (in)	Depth to Bedrock (in)	Slope (%)	Surface Layer Rock Fragments (%)	Surface Layer pH	Restrictions[1]	Water Erosion Hazard	Wind Erosion Hazard	Suitability for Reclamation[2]
1081	Bobs-Fax-Parisa assoc.	Bobs very gravelly loam	10-20		2-15	0-15	7.9-9.0	Depth to restrictive layer, high pH	Slight	Slight	Poor
		Fax very cobbly coarse sandy loam	20-36		4-15	25-50	7.4-8.4	Excess stones	Slight	Slight	Poor
		Parisa gravelly loam	20-40		2-8	0-10	7.9-9.0	High pH	Slight	Slight	Poor
1372	Wardbay-Hardol-Adobe assoc.	Wardbay very gravelly loam		40-60	15-50	0-15	7.4-8.4	Slope	Slight	Slight	Poor
		Hardol very gravelly silt loam		>60	15-30	10-25	7.4-8.4	Slope	Moderate	Slight	Poor
		Adobe very gravelly silt loam		14-20	15-50	0	7.9-8.4	Depth to rock, slope	Moderate	Slight	Poor

[1] These values apply to salvaged soil.
[2] Based on the requirements of a rangeland seeding.
Source: SRK, 2008.

Although stripping, stockpiling, and redistribution adversely affect soil characteristics, including alterations of soil profiles and soil structures, the benefits of using soil for revegetation outweigh the adverse effects of soil handling. The locations of existing and proposed growth medium stockpiles are shown in Figures 1-1 and 1-3. Reclamation and revegetation efforts would return some areas of soil disturbance to a productive state following construction, thereby reducing the duration and magnitude of impact. Loss of soil or discontinuation of natural soil development, decreased infiltration and percolation rates, decreased available water-holding capacities, breakdown of soil structures, and loss of organic material as a result of the Proposed Action would be lessened by natural soil development over a 200- to 10,000-year period following reclamation (Gerrard, 2000). Loss of soil fertility, soil microorganisms, and vegetative productivity would be minimized after successful reclamation.

Potential indirect effects of soil destabilization and erosion would be dust generation and off-site deposition. Wind erosion of disturbed soils could impact air quality and/or result in deposition of soil particles off-site. Off-site stream sedimentation would be minimized by the use of erosion control practices described in Section 2.4. Increased sediment loads would be minimized through the use of Best Management Practices and deposition in streams below the areas of disturbance are not anticipated, as there are no perennial streams in the vicinity of the new disturbance and sediment catchment basins would be placed around the base of soil stockpile and dump slopes. Other Design Features (Table 2-13) such as interim seeding would be used. Dust generated by vehicular traffic would be reduced by using dust abatement techniques such as the application of wetting and binding agents on haul roads. Erosion from growth medium stockpiles would be kept at a minimum with the practice of interim seeding.

Additionally, direct impacts to soil from the release of mill reagents or leach solutions during operation of the facility would be minimized with the continued use of the spill prevention (Section 2.3.11) and dust control measures (Section 2.4.1) which are currently in place. Reclamation of heap leach pads, as described in Section 2.3.14, includes a greater depth of cover by growth medium (approximately 24 inches) in order to create a stable post-closure landform and reduce infiltration of meteoric water.

Alternative A – Partial Backfill Alternative

With successful reclamation using salvaged growth medium on the backfill area, there would be no difference in the type of impacts to soil resources under this alternative compared with the Proposed Action. The Partial Backfill Alternative would, however, result in approximately 434 fewer acres of disturbance to soils.

Alternative B – Mooney Basin Heap Leach Pad Alternative

With successful reclamation using salvaged growth medium on the backfill area, there would be no difference in the type of impacts to soil resources under this alternative compared with the Proposed Action. However, there would be approximately 105 acres less surface disturbance.

No Action Alternative

Under this alternative, approximately 3,920 acres of disturbance to soil associated with the Proposed Action would not occur. Mining under the current permits would cease in 2009. No impacts would result other than those already authorized.

3.6 Vegetation Resources

3.6.1 Vegetation Affected Environment

Four vegetation community types are present in the Proposed Action area, excluding the wetland/riparian community type. The wetland/riparian community type is discussed in Section

3.9 of this document. Some portions of the Proposed Action area have been disturbed by previous and current mining activities.

Wildland fire management within the Proposed Action area is administered under the *Ely District Managed Natural and Prescribed Fire Plan*. According to the current plan there are no allowable burn acres within the Proposed Action area (BLM, 2000a). Portions of the Proposed Action area have naturally burned in the past. Figure 3-10 shows the areas that were burned by the Water Canyon, Chrome, and Jacob fires. Table 3-9 provides the acreage that each fire burned within the Proposed Action area and the reclamation techniques used for post-fire habitat rehabilitation.

TABLE 3-9 WILDLAND FIRES WITHIN THE PROPOSED ACTION AREA

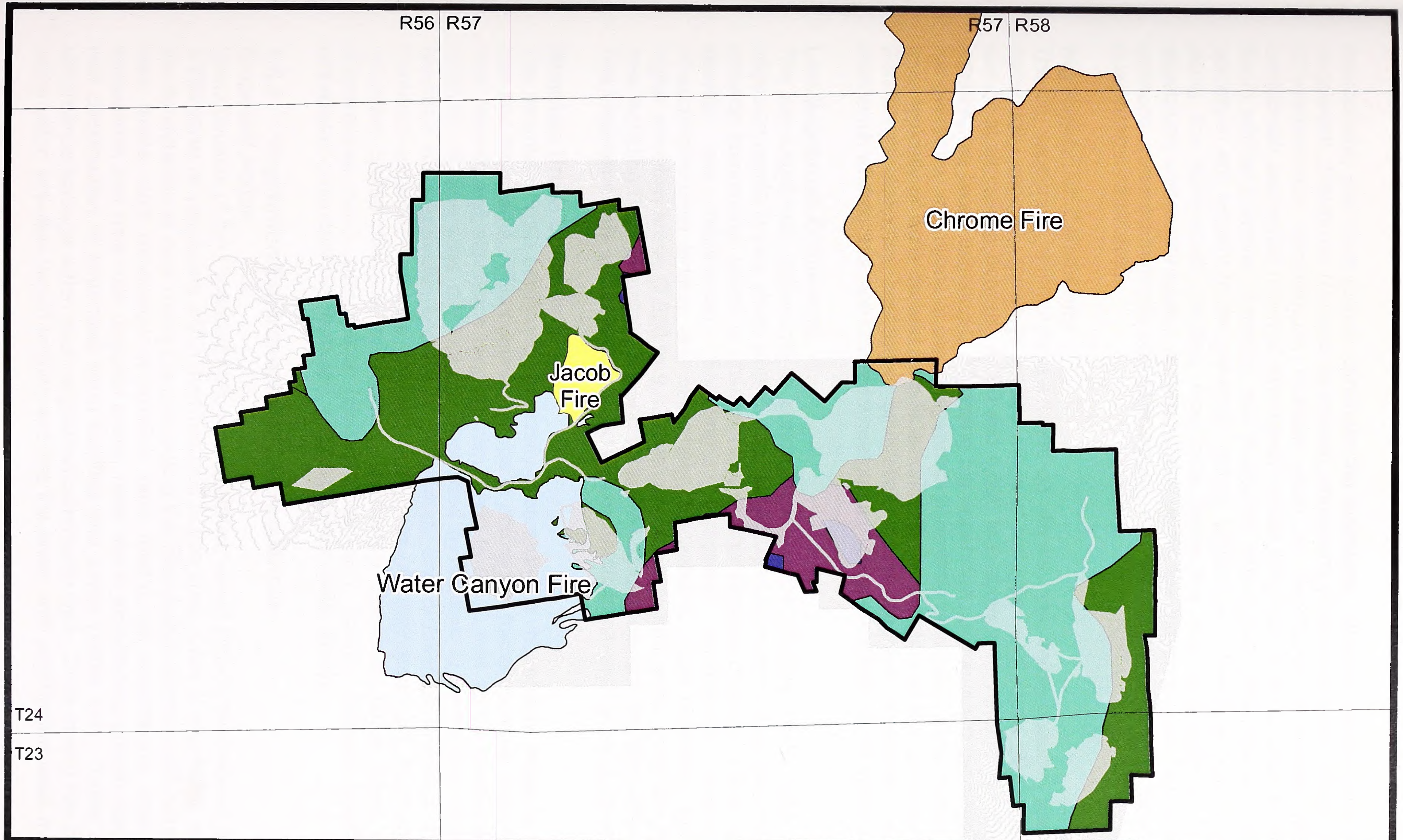
FIRE	YEAR	ACRES BURNED WITHIN PROPOSED ACTION AREA	RECLAMATION TECHNIQUES
Water Canyon	2001	1,785	Aerial seeding, broadcast seeding, drill seeding, chained and aerial seeded, and some areas left to naturally revegetate (BLM, 2006b)
Chrome	2004	124	Aerial seeded, chained and aerial seeded, with some areas left to naturally revegetate (BLM, 2006b)
Jacob	2000	222	Aerial seeding (BLM, 2000b)

The four vegetation community types present in the Proposed Action area include the pinyon-juniper woodland community, the big sagebrush community, the low sagebrush community, and the mountain brush community. The occurrence of these community types throughout the Proposed Action area is shown on Figure 3-10. The amount of each vegetation type present in the Proposed Action area is included in Table 3-10. Each of the community types is described further in the following sections.

TABLE 3-10 DISTURBANCE BY VEGETATION COMMUNITY TYPE

VEGETATION COMMUNITY TYPE	AREA WITHIN PLAN OF OPERATIONS BOUNDARY (ACRES)	PREVIOUSLY AUTHORIZED (NO ACTION ALTERNATIVE) (ACRES)	PROPOSED ACTION (ACRES)	PARTIAL BACKFILL ALTERNATIVE A (ACRES)	LEACH PAD ALTERNATIVE B (ACRES)
Pinyon-Juniper Community	7,482.0	1,930.0	1,712.0	1,522.0	1,652.0
Big Sagebrush Community	7,941.0	2,087.0	1,917.0	1,1673.0	1,872.0
Low Sagebrush Community	130.0	0.0	72.0	72.0	72.0
Mountain Brush Community	912.0	148.0	219.0	219.0	219.0
Total	**16,465**	**4,165.0**	**3,920.0**	**3,486.0**	**3,815.0**

Pinyon-Juniper Community
The pinyon-juniper community generally occurs on steep hillsides and mountains at all aspects, between 6,200 and 8,600 feet above mean sea level. This vegetation type generally occurs on shallow, loamy soils with high percentages of coarse fragments. Singleleaf pinyon (*Pinus*



Legend

- North Operations Project Boundary
- Chrome Fire
- Jacob Fire
- Water Canyon Fire
- Proposed Disturbance Area
- Big Sagebrush Community
- Low Sagebrush Community
- Mountain Brush Community
- Pinyon-Juniper Community

N

0 4,000 8,000
Feet
1:96,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-10
VEGETATION COMMUNITIES

monophylla) and Utah juniper dominate the overstory. Shrubs present include mountain big sagebrush, bitterbrush (*Purshia tridentata*), snowberry (*Symphoricarpos albus*), and rabbitbrush (*Chrysothamnus viscidiflorus*). Grasses such as Sandberg's bluegrass (*Poa sandbergii*), bottlebrush squirreltail (*Elymus elymoides*), Indian ricegrass (*Achnatherum hymenoides*), Great Basin wildrye (*Leymus cinereus*), and bluebunch wheatgrass (*Pseudoroegneria spicatum* ssp. *spicatum*) are present in the generally sparse understory. These woodlands generally occur along the north-south trending mountains below the low sagebrush and above the big sagebrush community types. Isolated areas within the pinyon-juniper community, where rock outcrops occur on summits and side slopes, are dominated by curlleaf mountain mahogany (*Cercocarpus ledifolius*).

Big Sagebrush Community
The big sagebrush community is present on alluvial fans, valley bottoms, and hillsides. This community generally grows on a wide range of soil types and depth, slopes, and aspects and occurs at elevations between 5,700 and 8,600 feet above mean sea level. Depending on the location, big basin sagebrush, Wyoming big sagebrush, or mountain big sagebrush dominate the overstory. Inclusions of black sagebrush (*Artemisia nova*) also occur within this community type, typically on soils derived from limestone. The understory of this community type includes Sandberg's bluegrass, bottlebrush squirreltail, Indian ricegrass, cheatgrass, lupine (*Lupinus*), bluebunch wheatgrass, and crested wheatgrass (*Agropyron cristatum*) in seeded areas.

Low Sagebrush Community
The low sagebrush community is concentrated on the shallow, rocky soils along mountain ridges on gentle to very steep slopes. Low sagebrush (*Artemisia arbuscula*) dominates this low-growing community, which is characterized by low species diversity. Other associated plant species are rabbitbrush, Sandberg's bluegrass, bottlebrush squirreltail, winterfat (*Krascheninnikovia lanata*), and buckwheat (*Eriogonum*). This vegetation type occupies the higher elevation areas (7,500 to 9,300 feet above mean sea level) within the Proposed Action area including Buck Mountain, Big and Little Bald mountains, and the Maverick Springs Range. This vegetation type occurs interspersed with mountain brush and pinyon-juniper communities.

Mountain Brush Community
The mountain brush community generally occurs on the moderately steep to steep slopes of hills and mountains. This community type is commonly found on moist slopes with north and east aspects and elevations ranging from 6,900 to 9,300 feet above mean sea level. These relatively diverse sites are typically supported by shallow to moderately deep, loamy soils. Mountain big sagebrush, snowberry, bitterbrush, and rabbitbrush dominate the shrub cover. Common understory species include needlegrass (*Achnatherum* sp.), bluebunch wheatgrass, mountain brome (*Bromus marginatus*), Sandberg's bluegrass, Great Basin wildrye, sedges (*Cyperaceae* ssp.), balsamroot (*Balsamorhiza* sp.), lupine, bastard toadflax (*Comandra umbellata*), groundsel (*Senecio* sp.), and buckwheat (SRK, 2008).

3.6.2 Vegetation Environmental Consequences

Proposed Action
Direct impacts of the Proposed Action to vegetation would include the removal of approximately 3,920 acres of vegetation within the Proposed Action area. Loss of vegetation would result from the construction of new roads (i.e., re-routing the Elko public access road, construction of new haul roads, and expansion of existing haul roads), pit expansions, rock disposal area expansions and new rock disposal areas, heap leach expansions, growth medium stockpiles, and construction of expanded shop facilities and yards (Table 2-4). Table 3-10 shows the disturbance acreage within each vegetation community type. Once mining has been completed, reclamation activities would include seeding the areas with appropriate seed mixes. The seed

mix used would include both native and non-native species that have been successfully used in reclamation of disturbed areas in the past. The areas where vegetation would be removed under the Proposed Action are shown as proposed disturbance area on Figure 3-10. (Figure 3-10 shows more than just the proposed Action and illustrates the entire disturbance area). Approximately 540 acres of vegetation associated with expansion of the pits would be permanently lost. Although the remainder of the proposed disturbance would be re-seeded during reclamation, vegetation would consist mostly of grasses in the short-term. Native shrubs as well as pinyon pine would increase with time, but these communities would take many years to establish. The diversity of the vegetation community within the Proposed Action area would increase with reclamation and seeding activities.

Indirect impacts of the Proposed Action to vegetation would include the increased potential for non-native invasive species establishment. Other indirect impacts include the short-term loss of forage for wildlife, wild horses, and livestock and a potential increase of the erosion potential to soils. These indirect impacts to other resources are discussed further in the appropriate sections of this FEIS.

Alternative A – Partial Backfill Alternative
Direct and indirect impacts for this alternative would be the same as for the Proposed Action but for a smaller area. The total area of vegetation removal for this alternative is approximately 434 acres less than with the Proposed Action. The reduction in vegetation loss would be a result of smaller waste rock disposal areas, and the impact would vary in accordance with the amount of vegetation type affected. In addition, backfilled pit areas would be re-seeded, further reducing the permanent loss of vegetation. The amount of vegetation to be removed by this alternative is shown by vegetation type in Table 3-10.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Direct and indirect impacts for this alternative would be the same as for the Proposed Action, only for a smaller area. There would be a reduction of 105 acres of surface disturbance (vegetation removal) with this alternative. This alternative is shown by vegetation type in Table 3-10.

No Action Alternative
Impacts resulting from this alternative would consist of the removal of vegetation for previously permitted activities within the Proposed Action area. The amount of vegetation to be removed under this alternative is shown in Table 3-10.

3.6.3 Special Status Plant Species Affected Environment

Federally listed species include endangered or threatened species, or species proposed for listing by the U.S. Fish and Wildlife Service. The status of threatened and endangered species is determined by the U.S. Fish and Wildlife Service under the provisions of the Endangered Species Act of 1973, as amended. Under the Endangered Species Act, endangered species are defined as being in danger of extinction throughout all or a significant portion of their range (USDI, 1973). Threatened species are likely to become endangered in the foreseeable future. The U.S. Fish and Wildlife Service also maintains a listing of species or subspecies (i.e., taxa) that may warrant listing as threatened or endangered, and for which the U.S. Fish and Wildlife Service has sufficient biological information to support a rule to list as threatened or endangered. These species are referred to as candidate species. Proposed species are species (taxa) for which the U.S. Fish and Wildlife Service has published a proposal to list as threatened or endangered in the Federal Register. Based on consultation with the U.S. Fish and Wildlife Service and surveys conducted, no federally listed plant species are known to occur or were identified in the Proposed Action area. Federally listed wildlife species are discussed in Section 3.8.5.

In addition to federally listed, proposed species, the BLM maintains a list of Nevada sensitive species. The BLM Manual 6840.06 E states that native species may be listed as sensitive if the species:

- Could become endangered or extirpated from a state, or within a significant portion of its range, in the foreseeable future;
- Is under review (for listing as threatened or endangered) by the U.S. Fish and Wildlife Service;
- Is undergoing significant current or predicted downward trend in habitat capability that would reduce the species' existing distribution, and/or population or density such that federally listed, proposed, or state-listed status may become necessary;
- Typically consists of small and widely dispersed populations;
- Inhabits ecological refugia, or specialized or unique habitats; and
- Is state-listed but may be better conserved through application of BLM sensitive species status.

The BLM affords these species the same level of protection as federal candidate species. The BLM's policy for sensitive species is to avoid authorizing actions that would contribute to the listing of a species as threatened or endangered.

The Nachlinger catchfly (*Silene nachlingerae*), a BLM sensitive species, has been identified as potentially occurring in the Proposed Action area. Habitat for this species is described as "dry, exposed carbonate crevices in ridgelines, outcrops, talus, or very rocky soils on or at the bases of steep slopes or cliffs" (NNHP, 2001a). The species has been recorded at elevations ranging from 7,160 feet to 11,250 feet. This species is found in Elko County in the southern portion of the Ruby Mountains. It is found in the Cherry Creek, Egan, Schell Creek, and Snake ranges in White Pine County. Two locations have been recorded in Nye County: one in the Horse Range and one in the Grant Range (NNHP, 2001a). During the baseline biological surveys (SRK, 2008), no habitat for this species was observed within the Proposed Action area. No other BLM sensitive species or habitat for sensitive species was identified in the Proposed Action area.

3.6.4 Special Status Plant Species Environmental Consequences

Proposed Action

There would be no direct or indirect impacts from the Proposed Action on special status plant species because no special status species or habitat for special status species was identified within the Proposed Action area.

Alternative A – Partial Backfill Alternative

Direct and indirect impacts of this alternative to special status plant species would be the same as with the Proposed Action because no special status plant species or potential habitat was found within the Proposed Action area.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Direct and Indirect impacts of this alternative to special status plant species would be the same as with the Proposed Action because no special status plant species or potential habitat was found within the Proposed Action area.

No Action Alternative
Under this alternative, activities associated with the Proposed Action would not occur. There would be no impacts other than those already disclosed in the BMM 1995 EIS.

3.7 Non-Native Invasive Species

3.7.1 Non-Native Invasive Species Affected Environment

The BLM defines a weed as a non-native plant that disrupts or has the potential to disrupt or alter the natural ecosystem function, composition, and diversity of the site it occupies. A weed's presence deteriorates the health of the site, makes efficient use of natural resources difficult, and may interfere with management objectives for that site. It is an invasive species that requires a concerted effort (manpower and resources) to remove from its current location, if it can be removed at all. A noxious weed is a species that has received a federal or state designation as a noxious weed. In the Proposed Action area this designation can come from the Nevada Department of Agriculture or from the U.S. Department of Agriculture Animal and Plant Health Inspection Service (NDA, 2008: USDA, 2008). Both noxious weed species and invasive weed species are found in the Proposed Action area.

A BLM noxious weed risk assessment, as defined in BLM Manual 9015 (BLM, 1992b), was conducted during 2007 in order to determine existing weed populations and evaluate the risk of introducing or spreading noxious weeds as a result of the Proposed Action. As part of the risk assessment, noxious weeds identified during surveys were placed into one of three classes of the Nevada noxious weed identification system: Class A, Class B, or Class C. Class A weeds are limited in distribution within the state of Nevada and area, and complete control is emphasized. Class B weeds are limited in distribution in the region but are known to occur in other regions within the state of Nevada. Management of Class B weeds is to control population spread and decrease population size. Class C weeds include the remainder of noxious weeds, and management focuses on controlling population size (BLM, 1992b). Barrick conducts annual noxious weed treatments in the BMM and Mooney Basin Operations Area. Treatment frequency varies by year, location of species, type of species, and abundance of species (Vaught, 2008).

The BLM and SRK Consulting performed weed inventories within the Proposed Action area and surrounding areas (SRK, 2008). The weed inventory was then used to conduct the risk assessment for the Proposed Action. A list of noxious weeds identified within the Plan of Operations boundary and identified class for each is provided in Table 3-11. The noxious weed surveys conducted, BLM weed database, and information from Tri-County Weed Control indicate that one Class A, three Class B, and four Class C weed species are present within the Proposed Action area (SRK, 2008; BLM, 2007a; Tri-County Weed Control, 2007). Locations of noxious weeds surveyed within the Proposed Action area are shown in Figure 3-11 (BLM, 2007a; Tri-County Weed Control, 2007).

TABLE 3-11 NOXIOUS WEEDS PRESENT IN THE PROPOSED ACTION AREA

Common Name	Scientific Name	Location			Weed Class	Risk Assignment*
		Proposed Action Area	Surrounding Public Roads	Surrounding Areas		
Black henbane	*Hyoscyamus niger*	Yes	Yes	Yes	C	25
Musk thistle	*Carduus nutans*	Yes	Yes	Yes	B	50
Russian knapweed	*Acroptilon repens*	No	No	Yes	B	25
Scotch thistle	*Onopordum acanthium*	Yes	Yes	Yes	B	25
Salt cedar	*Tamarix* spp.	Yes	No	No	C	**
Hoarycress	*Lepidium draba*	No	Yes	Yes	C	50
Canada thistle	*Cirsium arvense*	Yes	Yes	Yes	C	50
Spotted knapweed	*Centaurea stoebe*	Yes	No	No	A	25

*High = 50-100; Moderate = 11-49; Low 1-10; None = 0 (SRK, 2008)
** Identified by BLM weeds database, no SRK Consulting risk assessment completed for this species.

Invasive weeds in the Proposed Action area appear on the BLM National List of Invasive Weed Species of Concern (BLM, 2008c). Documented invasive species include cheatgrass (*Bromus tectorum*), bull thistle (*Cirsium vulgare*), and Russian thistle (*Salsola kali*) (NRC, 2004; SRK, 2008). Bull thistle locations are shown on Figure 3-11. Russian thistle has been identified on the reclaimed RBM rock disposal areas and the reclaimed Rat rock disposal areas (NRC, 2004). Cheatgrass is an invasive species that can out-compete seedlings of perennial species and is very competitive in drier environments (Sheley and Petroff, 1999). Cheatgrass can be found throughout the Proposed Action area and particularly in some of the burned areas shown in Figure 3-10. The displacement of native species with invasive species such as cheatgrass can alter natural fire regimes and decrease productivity (Sheley and Petroff, 1999).

3.7.2 Non-Native Invasive Species Environmental Consequences

Proposed Action

The anticipated environmental impact from non-native species is the increased risk that these species could spread to new areas, as described below.

Noxious weed impacts from the Proposed Action include the potential for additional establishment of noxious weeds with the removal of native vegetation on approximately 3,920 acres. Indirect impacts include a decrease in native plant communities with the increase in competition from noxious weeds. These impacts are expected to be negligible with continued implementation of the Design Features (Table 2-13) and BLM Best Management Practices (Appendix D) and reclamation activities including revegetation and monitoring (BMM, 2009).

Non-native invasive species impacts within the Proposed Action area include the potential spread of non-native invasive species into disturbed areas and along transportation routes. Spread of these undesirable species can lead to a change in the natural fire regime and decrease productivity (Sheley and Petroff, 1999). Successful reclamation, Design Features (Table 2-13), and BLM Best Management Practices (Appendix D), would minimize potential impacts from invasive non-native species.

Alternative A – Partial Backfill Alternative
Impacts to non-native invasive species with this alternative would be the essentially same as the Proposed Action, although there would be a reduction of approximately 434 acres of surface disturbance.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Impacts to non-native invasive species with this alternative would be essentially the same as with the Proposed Action, although there would be a reduction of approximately 105 acres of surface disturbance.

No Action Alternative
Under this alternative, the approximately 3,920 acres of disturbance to soil associated with the Proposed Action would not occur. There would be no additional risk of spreading non-native invasive species under this alternative.

3.8 Wildlife

Wildlife species occurring in the Proposed Action area include big game and non-game mammals, predatory species, game birds, migratory bird species, bats, reptiles, and amphibians. Wildlife occurrence in the Proposed Action area has been described in the BMM EIS (BLM, 1995a), several past Environmental Assessments (BLM, 2003a, 2004b, 2005b, 2006c), and NDOW's Mule Deer Herd Prescription, Management Area 10 (NDOW, 2007e). In addition to these previous environmental documents, recent dedicated baseline wildlife surveys were conducted in the Proposed Action area by SRK Consulting (2008).

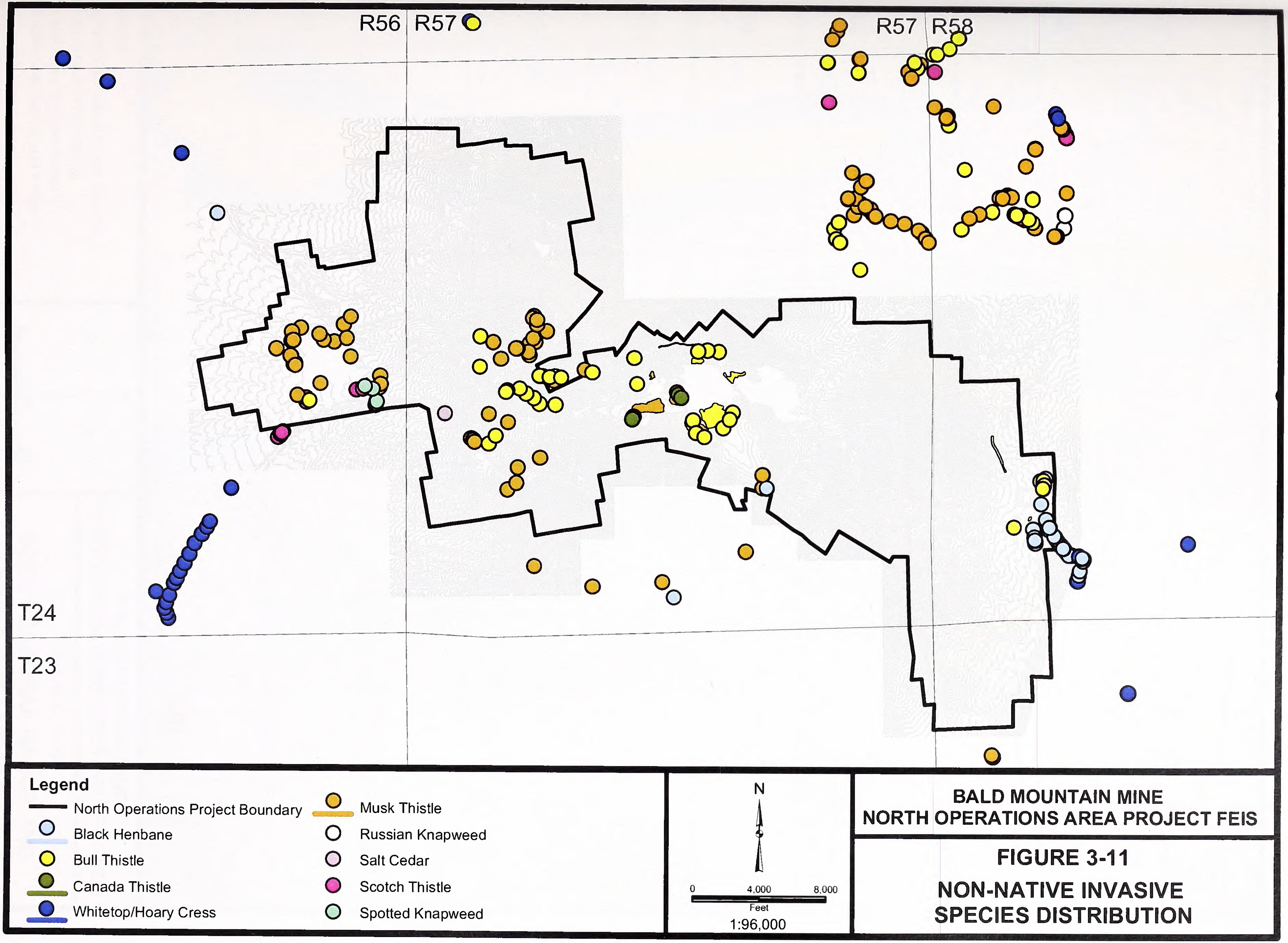
Assumptions for Analysis
Assumptions made for the wildlife analysis include the following:

- Wildlife would avoid active operational areas and move back into these areas once activity ceases and the site has been reclaimed; and
- The breeding season for birds, April 15 to July 15, is accurate and would include all breeding activities.

3.8.1 Wildlife Affected Environment

Big Game
As described in the BMM EIS (BLM, 1995a), mule deer (Odocoileus hemionus) are the most common big game species in and near the Proposed Action area. NDOW estimates that a resident population of between 200 and 400 mule deer occurs in and near the Proposed Action area. Specifically, these deer occur in low densities in the Big Bald Mountain, Little Bald Mountain, Buck Mountain, Mooney Basin, and Alligator Ridge areas (Wasley, 2007a). Most deer remain within two miles of a water source and are most commonly found in mountain brush habitats (SRK, 2008). Mountain brush habitats comprise approximately 5.5 percent of the Proposed Action area (Table 3-10). The scarcity of surface water in the Proposed Action area is a limiting factor for summer resident mule deer populations.

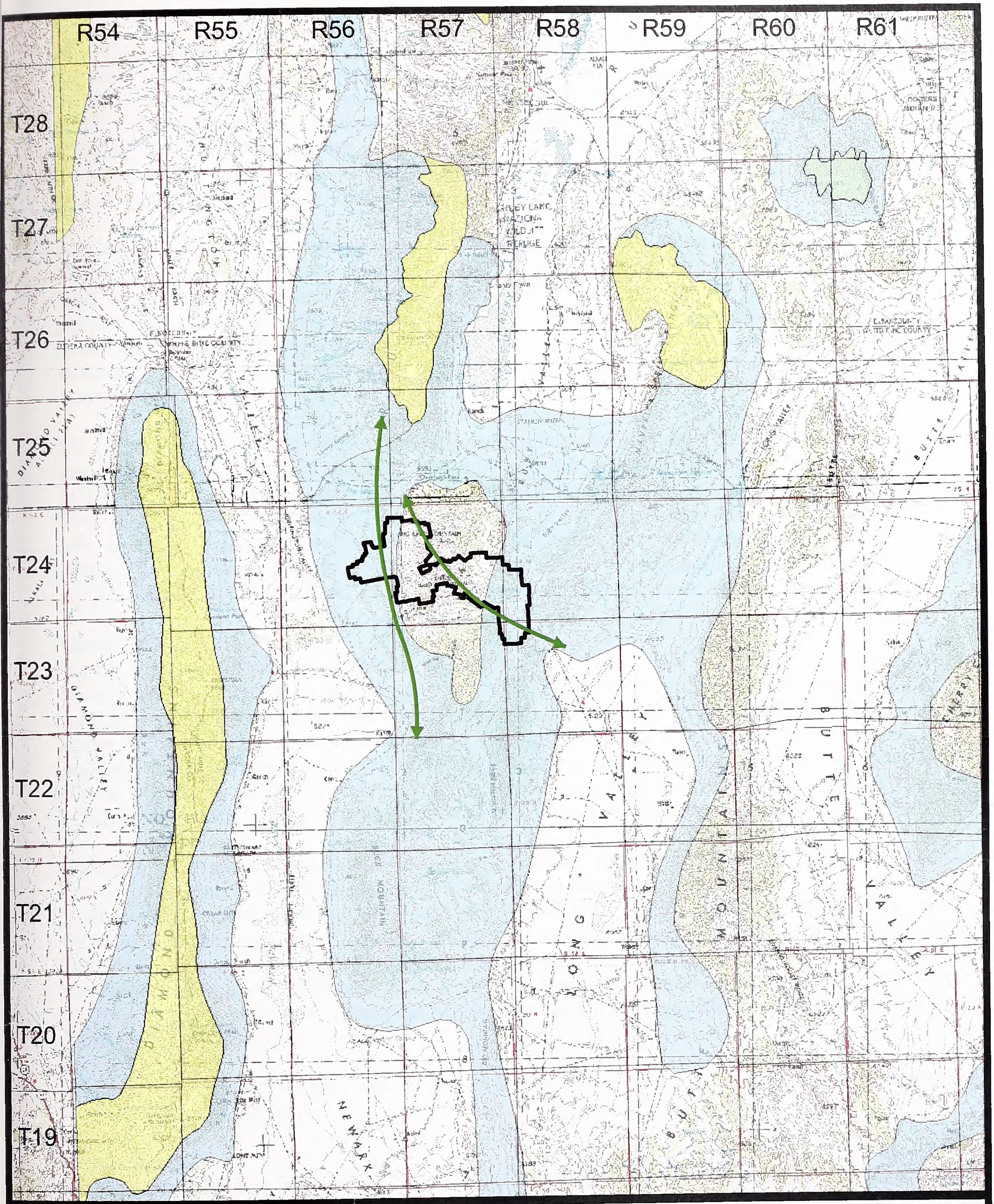
In addition to resident mule deer, the Proposed Action area is located in a migration corridor utilized by the Ruby Deer Herd (Figure 3-12). This herd occupies the Ruby and East Humboldt mountain ranges during the summer season and moves south with the onset of winter snowfall. The extent of this southward movement, both in terms of numbers of deer and actual travel routes and distance traveled, is influenced by the amount of snow accumulation. During mild winters, few deer may move as far south as the Proposed Action area, but during heavy winters,



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-11

NON-NATIVE INVASIVE SPECIES DISTRIBUTION



Legend

- North Operations Project Boundary
- Mule Deer Winter Range
- Mule Deer Summer Range
- Mule Deer Year Around Range
- (Migration Corridor Location Varies Annually With Conditions)

N

0 20,000 40,000

Feet

1:480,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-12

DEER SEASONAL RANGE AND MIGRATION CORRIDORS

NDOW estimates that as many as 16,000 deer may move through the Bald Mountain area and continue south at least as far as the Little Antelope Summit area near U.S. Highway 50 (Wasley, 2007a). Baseline studies indicate the migration corridor splits in the Proposed Action area (SRK, 2008). Most deer move south along the western flank of the southern Ruby Mountains (Wasley, 2007a), while smaller numbers move southeast toward the Maverick Springs Range and Butte Mountains (BLM, 1995a). Wintering deer move back north through the area as snows melt and spring green-up occurs.

Antelope (*Antilocapra americana*) numbers have increased in the area since the BMM EIS (BLM, 1995a) was published. Approximately 100 antelope now occur in the Buck Mountain and Bald Mountain areas, generally in the valley bottoms and on adjacent fans. Areas of pinyon-juniper habitat are not utilized (SRK, 2008). NDOW notes that antelope frequent agricultural fields in Newark Valley, with smaller numbers occurring in surrounding valleys (Wasley, 2007a). Antelope may occur in low numbers within the Proposed Action area, primarily at lower elevations.

Elk (*Cervus elaphus*) are also beginning to move into the Proposed Action area from the north and east. Elk numbers in the area are low, and the animals move over large areas (Lamp, 2007). The White Pine County Elk Management Plan (White Pine County, 2007) indicates the 2005 elk population estimate for the White Pine County portion of hunt units 104, 108, 121 was 140 animals. According to the Elk Management Plan, no augmentation projects for elk are planned in this area. NDOW has a single report of mountain goats (*Oreamnos americanus*) in the Bald Mountain area (Lamp, 2007). These animals did not remain in the area.

Game Birds

Game birds potentially occurring in the Proposed Action area include greater sage-grouse (*Centrocercus urophasianus*), chukar (*Alectoris chukar*), gray (Hungarian) partridge (*Perdix perdix*), and mourning doves (*Zenaida macroura*). Sage-grouse are discussed in Section 3.8.5, under BLM sensitive species. Chukar occur in rugged, rocky areas near available water sources. Gray partridge occur near riparian drainages and in agricultural areas, while mourning doves occupy a variety of habitats but require access to water. Sightings of dusky grouse (*Dendragapus obscurus)*, formerly known as blue grouse, have been reported in the area.

Because water sources are limited in the area, NDOW, with assistance from BMM, has installed two of four planned wildlife guzzlers (precipitation collection and storage structures) in the southern Ruby Mountains in and near the Proposed Action area. While designed for big game, these structures are utilized by a wide variety of wildlife species. Two guzzlers have been installed south of the Proposed Action area, near the inactive Alligator Ridge Mine and the inactive Yankee Mine. Potential locations for guzzlers have been identified in Bourne Canyon, south and southwest of the Proposed Action area, and in Mooney Basin, south of the Proposed Action area (Figure 3-13).

Raptors occurring in the area are discussed under State-Protected Species and BLM Sensitive Species in Section 3.8.5.

Other Wildlife

Other game and non-game mammals including mountain lions (*Felis concolor*), coyotes (*Canis latrans)*, bobcats (*Felis rufus*), and badgers (*Taxidea taxus*) occur as the larger or more common predators in the area. Mountain lions and bobcats are usually associated with more rugged, rocky areas, while coyotes and badgers are typically found in sagebrush and mountain brush communities (SRK, 2008). Red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), and kit fox (*Vulpes macrotis*) may occur in the area. Mammalian prey species present in the Proposed Action area include black-tailed jackrabbits (*Lepus californicus*), mountain cottontails (*Sylvilagus nuttallii*), and a variety of small rodents. White-tailed jackrabbits (*Lepus townsendii*) may occur at higher elevations in the Proposed Action area. Porcupines (*Erythizon dorsatum*) and woodrats (*Neotoma* sp.) are reported to utilize wooded habitats, and pikas (*Ochotona princeps*) may occur in higher-elevation rocky habitats (SRK, 2008). According to NDOW's Wildlife Species List - South Ruby Allotment (Unit 104) (Appendix F), reptiles expected to occur in the area include the western fence lizard (*Sceloporus occidentalis*), sagebrush lizard (*Sceloporus graciosus*), desert horned lizard (*Phrynosoma platyrhinos*), gopher snake (*Pituophis melanoleucus*), and Great Basin rattlesnake (*Crotalus viridis lutosus*). Amphibians potentially occurring in the area include the Pacific chorus frog (*Pseudacris regilla*) and Great Basin spadefoot toad (*Scaphiopus intermontanus*).

Fisheries

No fisheries or potential fish habitat exist in the Proposed Action area.

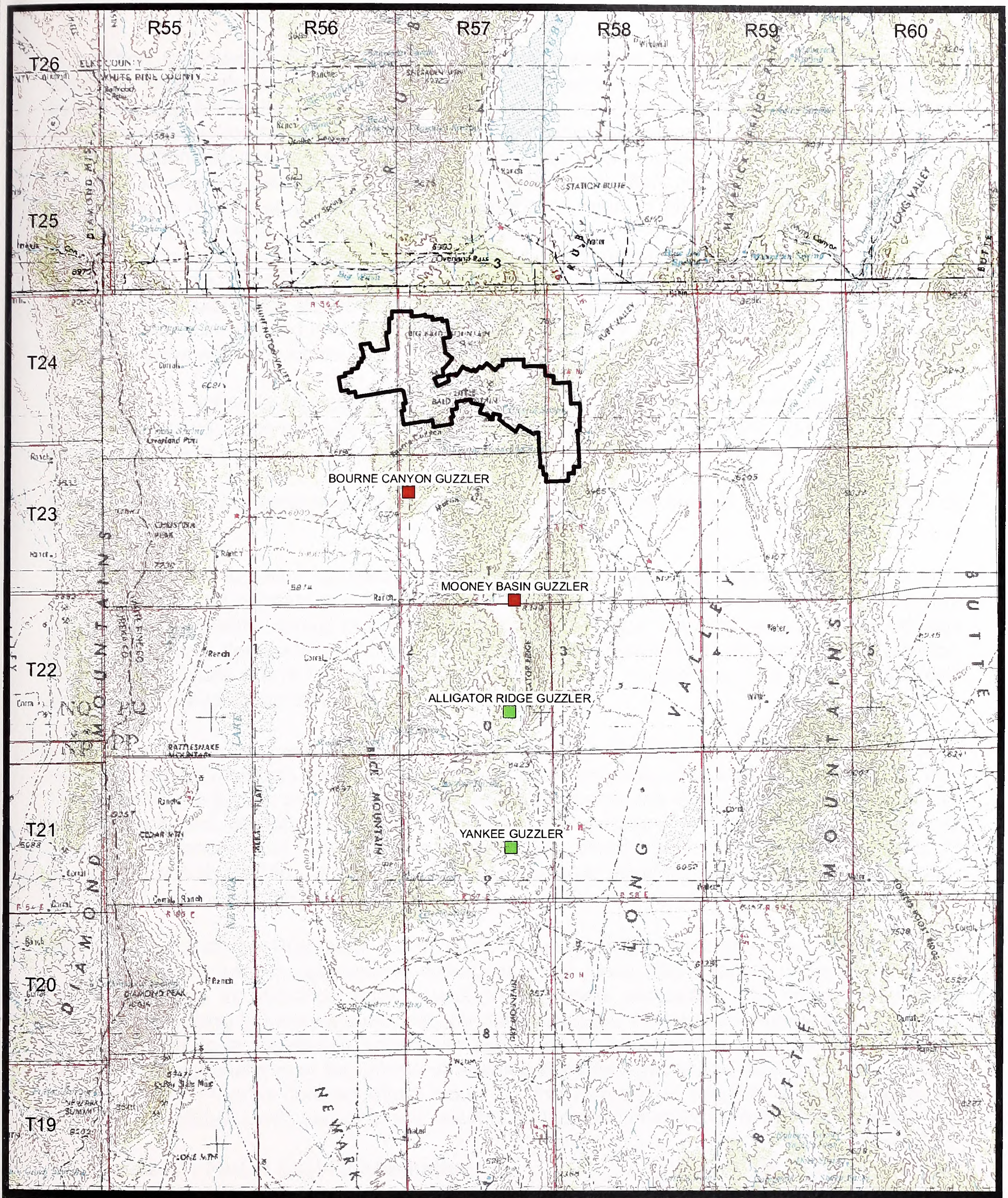
3.8.2 Wildlife Environmental Consequences

Proposed Action

Anticipated environmental impacts to wildlife resources include loss of habitat, potential injury and mortality from increased traffic, and human disturbance, as described below. Potential impacts can be categorized into those that are temporary and those that are permanent. Impacts may also be adverse (destruction of habitat) or beneficial (increased vegetative diversity) for one or more species.

NDOW has previously expressed concern over mining operations in this region because the Proposed Action area is located in a migration corridor utilized by the Ruby Deer Herd (Figure 3-12), and disturbance in the area may reduce the transitional habitat present (i.e., a narrow passage), potentially adversely affecting deer movement. Such a bottleneck would have the greatest potential impact on mule deer during winters of heavy snow accumulation, when deer traditionally move south through the Proposed Action area to reach wintering grounds in the Little Antelope Summit area near U.S. Highway 50.

As noted in Section 3.8.1, most north-south migratory deer movement occurs on the western side of the Proposed Action area. NDOW notes the current haul road on the western side of the Proposed Action area is constructed across steep slopes and includes cuts and fills that could hamper deer movement. This issue was also noted in the 1995 EIS (BLM, 1995a), which stated that "hazards to deer moving across the haul road and negotiating the steep, rocky hill adjacent to the road have been recorded." The 1995 document goes on to state that observation of deer behavior suggested that the development proposed at that time would not adversely affect deer movement. NDOW is concerned that the berms constructed on the downhill sides of the haul road (required by Mine Safety Health Administration regulation to be at least half the height of the largest vehicle tires used on the mine site) may inhibit deer movement. Deer that enter the haul road areas with high, steep berms may have difficulty exiting the road and could also be exposed to collision with mine vehicles. However, actual mortalities of deer due to impacts with equipment on existing haul roads have been rare (Zietlow, 2007b), and there have been only six deer mortalities in mine traffic areas reported at the site over the past 12 years. NDOW has suggested that BMM install gaps in the road berm to allow the deer to more easily exit the haul road. The Mine Safety Health Administration would not object to the installation of such gaps, as long as gap size does not become excessive (Bixler, 2007). This has been incorporated in the Proposed Action.



Legend

- North Operations Project Boundary
- Nevada Department of Wildlife Guzzler Locations
- Nevada Department of Wildlife Proposed Guzzler Locations

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-13
NDOW GUZZLER LOCATIONS

In addition to potential impacts on seasonal deer movements, approximately 219 acres of mountain brush habitat would be impacted by the Proposed Action (Table 3-10) and would no longer be available to the small number of deer that permanently reside in the Proposed Action area. This vegetation type is preferred deer habitat within the Proposed Action area. Impacts to lower elevation habitats on the flanks of the range and in the Mooney Basin area would reduce the amount of potential wintering habitat in the Proposed Action area. A permanent loss of approximately 540 acres of habitat is anticipated as a result of pit expansions. Although there would be some loss of wintering habitat during operation, it is anticipated that conversion of some pinyon-juniper and other areas to shrub and grass habitats following successful reclamation would benefit mule deer populations by enhancing forage in the wintering range and migratory pathways. Because of the abundance of pinyon-juniper (Table 3-10), the loss of some trees is not expected to significantly reduce the amount of thermal cover available for deer and other large wildlife species.

The Proposed Action is expected to have little impact on antelope, which primarily utilize lower elevation habitats, or on elk, which move widely throughout the area. Water sources in the area would continue to be avoided by design and would remain available for deer and other wildlife.

Mining activities near water sources may, however, cause some species to avoid these areas at times.

The impacts to currently undisturbed portions of the Proposed Action area would also temporarily reduce habitats available for other wildlife. Smaller and less mobile animals may suffer direct mortality during land-clearing activities. Larger species would be forced into adjoining habitats, temporarily increasing competition with resident individuals in those habitats. If adjacent habitats are at carrying capacity, the increased competition or a lack of resources could result in wildlife mortality.

Impacts to wildlife from exposure to cyanide or other hazardous chemicals are not expected, since hazardous materials are contained within closed vessels and/or lined and covered ponds. Process solution ponds, including cyanide-containing ponds, are double lined with high density polyethylene and equipped with leak collection and recovery systems. Ponds containing cyanide are fenced and covered with floating high density polyethylene balls designed to prevent access by wildlife. Should wildlife access process solutions, at a gap in pond coverage, for example, some mortality could occur.

Indirect effects of the Proposed Action could result if wildlife species alter their use of the Proposed Action area in response to disturbance and move into adjacent undisturbed areas. Such a change in utilization could result in increased competition for limited resources, potentially resulting in increased mortality for some species. Conversely, conversion of pinyon-juniper habitat to a sagebrush vegetation type may benefit species such as greater sage-grouse. Pit high walls may be utilized as nesting sites by raptors and swallows and as roost sites by bats. Another indirect effect would be the increase in the risk of wildlife injury or mortality by collisions with vehicles as a result of an increase in traffic on mine access roads.

Alternative A – Partial Backfill Alternative

Selection of this alternative would result in a reduction of total disturbance to vegetation at the mine site, relative to the Proposed Action. Specifically, rock disposal area disturbance would be reduced by up to 434 acres.

Portions of the Belmont Pit 2, East Bida Pit, North Pit 1, Saga Pit, and Sage Flat Pit would be backfilled and reclaimed. This would reduce the total unreclaimed acreage remaining at the close of mining. Because these areas are immediately adjacent to active mining areas, wildlife species are likely to avoid these areas during operations. Therefore, short-term impacts would be similar to those of the Proposed Action. Over the longer term, wildlife would be expected to utilize the reclaimed areas.

Alternative B – Mooney Basin Heap Leach Pad Alternative

Selection of this alternative would result in a reduction in impacts to big sagebrush habitat in the Mooney Basin area but an increase in the size of the 2/3 Heap Leach Pad and associated facilities. Under this alternative, less big sagebrush habitat would be impacted in the Mooney Basin area due to the reduction of 105 acres in the size of the Mooney Basin Heap Leach Pad and associated facilities; however, because it is an active mine site, wildlife species are still likely to avoid the area during operations.

No Action Alternative

Under this alternative, new mine development at the BMM and Mooney Basin areas would not occur. Permitted disturbance would likely be implemented, resulting in a total of up to 4,165 acres of disturbance in the BMM and Mooney Basin areas. Active mining in the Proposed Action area will cease in 2009. Some wildlife would continue to avoid the active mining area until reclamation is complete, while other species or individuals, which have become habituated to the activity, would continue to use the area.

3.8.3 Migratory Birds Affected Environment

Migratory birds include species of birds that breed in the Proposed Action area but migrate south, out of the area, prior to the onset of winter. Migratory bird species are defined and protected by the Migratory Bird Treaty Act of 1918. This act prohibits killing or taking migratory bird species. Protection under the Act extends to nesting birds, their eggs, and occupied nests.

Avian species composition and density in the area varies with season and habitat type. Avian species diversity is highest during the spring and summer months, when migrant species are nesting in the area. Species diversity decreases markedly during the fall and winter seasons, when many nesting species move south, out of the Proposed Action area. Surveys of avian species utilizing the Proposed Action area were conducted in 1994 (JBR, 1994) as part of baseline surveys conducted in connection with the BMM EIS (BLM, 1995a). More common species recorded during the 1994 surveys included northern flickers (*Colaptes auratus*), mountain chickadees (*Poecile gambeli*), house wrens (*Troglodytes aedon*), sage thrashers (*Oreoscoptes montanus*), and Brewer's sparrows (*Spizella breweri*). Most species recorded during these surveys migrate out of the Proposed Action area before the onset of winter, though a few, including northern flickers as well as horned larks (*Eremophila alpestris*), black-billed magpies (*Pica hudsonia*), and bushtits (*Psaltriparus minimus*), may remain in the area year-round. More recent surveys were conducted as a part of the baseline data collection for this EIS (SRK, 2008). Migrant species recorded during the SRK Consulting surveys include broad-tailed hummingbirds (*Selasphorus platycercus*), western wood-pewees (*Contopus sordidulus*), mountain bluebirds (*Sialia mexicana*), green-tailed towhees (*Pipilo chlorurus*), and sage sparrows (*Amphispiza belli*).

The sagebrush, mixed brush (also referred to as mountain brush), pinyon-juniper, and mountain mahogany vegetation communities each support differing communities of birds. Brewer's sparrows and sage thrashers are common breeding species in sagebrush habitats. Green-tailed as well as spotted towhees (*Pipilo maculatus*) are usually found in the mountain/mixed brush habitats. Mountain chickadees as well as nuthatches (*Sitta* sp.) and species such as plumbeous vireos (*Vireo plumbeus*) are typically associated with pinyon-juniper. During the 1994 surveys, house wrens were most often found in mountain mahogany stands.

A Breeding Bird Atlas Block (atlas block) was established just south of the Proposed Action area as a part of the Atlas of Breeding Birds of Nevada program (Floyd et al., 2007). The atlas block is located on Little Bald Mountain north of Bourne Canyon in habitat similar to that of the Proposed Action area. Atlas blocks are surveyed during the breeding season. Surveyors identify bird species present on the atlas block and attempt to determine whether those species breed on the atlas block. The 4-square-kilometer atlas block was surveyed in 2000. Table 3-12 lists species recorded on the atlas block as well as their breeding status.

The BLM's Nevada Migratory Bird Best Management Practices for the Sagebrush Biome (BLM, 2003b) notes that sagebrush landscapes within the Great Basin "are complex and variable" and actually include a mosaic of habitat types that include varying amounts of sagebrush as well as annual and perennial grasses, forbs, wetland and riparian areas, and pinyon-juniper woodland. No riparian habitat, other than a few isolated willow patches, is found within the Proposed Action area. The BLM's Nevada Migratory Bird Best Management Practices for the Sagebrush Biome document stresses the importance of maintaining the sagebrush biome mosaic and potentially employing management practices designed to enhance habitats for target species. The document, herein incorporated by reference, reviews the habitat requirements of a number of avian species of concern, including greater sage-grouse, ferruginous hawks (*Buteo regalis*), and burrowing owls (*Speotyto (Athene) cunicularia*) (all BLM sensitive species, as discussed below) and lists management practices that would tend to benefit specific species.

TABLE 3-12 BREEDING BIRD ATLAS SURVEY RESULTS, SOUTHERN RUBY MOUNTAINS BLOCK

SPECIES	BREEDING STATUS
Red-tailed Hawk (*Buteo jamaicensis*)	Probable breeder
Peregrine Falcon (*Falco peregrinus*)	Possible breeder
Mourning Dove (*Zenaida macroura*)	Confirmed breeder
Northern Flicker (*Colaptes auratus*)	Confirmed breeder
Western Scrub-Jay (*Aphelocoma californica*)	Possible breeder
Black-billed Magpie (*Pica hudsonia*)	Confirmed breeder
Violet-green Swallow (*Tachycineta thalassina*)	Confirmed breeder
Mountain Chickadee (*Poecile gambeli*)	Confirmed breeder
White-breasted Nuthatch (*Sitta carolinensis*)	Confirmed breeder
Rock Wren (*Salpinctes obsoletus*)	Possible breeder
House Wren (*Troglodytes aedon*)	Confirmed breeder
Blue-gray Gnatcatcher (*Polioptila caerulea*)	Confirmed breeder
Mountain Bluebird (*Sialia currucoides*)	Confirmed breeder
American Robin (*Turdus migratorius*)	Confirmed breeder
Sage Thrasher (*Oreoscoptes montanus*)	Confirmed breeder
Yellow-rumped Warbler (*Dendroica coronata*)	Possible breeder
Western Tanager (*Piranga ludoviciana*)	Confirmed breeder
Green-tailed Towhee (*Pipilo chlorurus*)	Confirmed breeder
Spotted Towhee (*Pipilo maculatus*)	Confirmed breeder
Chipping Sparrow (*Spizella passerina*)	Confirmed breeder
Brewer's Sparrow (*Spizella breweri*)	Confirmed breeder
Vesper Sparrow (*Pooecetes gramineus*)	Confirmed breeder
Lazuli Bunting (*Passerina amoena*)	Possible breeder
Brown-headed Cowbird (*Molothrus ater*)	Probable breeder
House Finch (*Carpodacus mexicanus*)	Confirmed breeder

3.8.4 Migratory Birds Environmental Consequences

Proposed Action

Anticipated environmental impacts to migratory birds include the possibility of nests being destroyed, loss of habitat, and displacement from human disturbance. Each of these anticipated impacts is described below.

To avoid certain impacts to active migratory bird nests, eggs, and/or young, Barrick proposes to continue performing land-clearing activities outside of the avian breeding season (April 15 to July 15, as specified by the BLM's Egan Field Office). If surface-disturbing activities are unavoidable during the avian breeding season, a qualified wildlife biologist would survey the areas of proposed disturbance immediately prior to the disturbance. Consistent with current practices, if active nests or evidence of nesting is found or observed, a buffer zone would be established around the nest area to prevent the destruction or disturbance of nests until young have fledged (left the nest).

The above measures are designed to avoid impacts to actively nesting birds. The Proposed Action would, however, result in impacts to and conversion of potential nesting habitat, incrementally reducing the area available for nesting. A permanent loss of approximately 540 acres of habitat is anticipated as result of pit expansions. The Proposed Action would disturb approximately 1,917 acres of big sagebrush habitat (see Table 3-10). Disturbance of up to 2,085 acres of this habitat type has been authorized within the Proposed Action area to date. A total of 1,712 acres of pinyon-juniper habitat would be disturbed by the Proposed Action, in addition to the disturbance of up to 1,928 acres of this habitat type authorized to date (a total of 3,640 acres). The majority of these disturbed areas would be reclaimed at or before (in the case of concurrent reclamation) the close of mining operations but would be temporarily unavailable to avian species and other wildlife. Reclamation would be designed to establish a productive post-mining environment that would support wildlife and grazing. Reclamation is intended to restore a grass-forb shrub community. Pinyon-juniper habitat would only return through natural colonization, meaning the reestablishment of pinyon-juniper habitats would only occur in the future following reclamation. The result of this change would alter local species composition over a longer period. As stated in the BLM's Nevada Migratory Bird Best Management Practices for the Sagebrush Biome (BLM, 2003b), "conversion of a juniper habitat type to a sagebrush habitat type would adversely affect gray flycatchers, juniper titmice, Bewick's wrens, blue-gray gnatcatchers, and black-throated gray warblers, but it would favor greater sage-grouse, Brewer's sparrows, sage sparrows, sage thrashers, vesper sparrows, burrowing owls and loggerhead shrikes."

Indirect effects that could result from implementation of the Proposed Action include displacement of migratory birds into adjacent habitats. As is the case with other wildlife, such a change in utilization could result in increased competition for limited resources.

The U.S. Fish and Wildlife Service has expressed concern that an increase in lighting at the BMM may affect migrating birds, many of which fly at night. Migrating birds may become attracted to or disoriented by artificial lights, particularly during inclement weather (Rich and Loncore, 2005). This disorientation represents a hazard if towers or other tall structures are present, as birds may collide with such structures. BMM operates on a 24-hour-a-day basis. Artificial lighting is used within pits, at sites where trucks are dumping (e.g., leach pads, rock disposal areas), and in areas with buildings. With the increase in the size and extent of these features, an increase in lighting can be expected. However, tall structures that may represent collision hazards are limited at the mine. The most "tower-like" structures are two lime silos, one at the BMM and one at Mooney Basin. Each of these silos is approximately 60 feet tall. The process plant and truck shop buildings are each about three stories high. The mine does not use large conveyors, which are often lighted. Further, most lighting at the mine utilizes white lights. According to Rich and Loncore (2005), red lights on towers are thought to be more disorienting than white lights. Mine personnel have not reported disoriented birds or other evidence of lighting/structure issues at the existing BMM operations (Zietlow, 2007d).

Exploration drill rigs used at the mine are approximately 30 feet tall. NDOW has not recorded a bird mortality associated with drill rigs. NDOW does note they are concerned about the presence of tall structures near sage-grouse leks (Lamp, 2007; Williams, 2007). However, none are proposed under the BMM North Operations Area Project. Drilling deep mine dewatering wells, which generally requires taller drill platforms, is not part of the Proposed Action.

Alternative A – Partial Backfill Alternative

Selection of this alternative would reduce rock disposal area disturbance by 434 acres. Reductions in rock disposal area size would reduce the effects on potential avian nesting habitat in these areas. Most species would directly benefit from reductions in disturbance area. Many species require habitat of a minimum size (which varies with species and from year to year, depending on environmental conditions) to breed successfully (DeGraaf and Rappole, 1995). Fragments of habitat below the minimum required size would not include sufficient resources to allow successful breeding. Conversely, if areas of preserved habitat are adjacent to undisturbed native habitat, the effects of fragmentation would be minimized. Reductions in rock disposal areas located within interpit areas may provide minimal suitable habitat to breeding birds. Reductions in the size of rock disposal areas on the edges of disturbance areas (e.g., the potential reduction in the size of the North 2 Rock Disposal Area) would provide the greatest benefit to breeding birds. Portions of the Belmont Pit 2, East Bida Pit, North Pit 1, Saga Pit, and Sage Flat Pit would be backfilled and then reclaimed. This would reduce the total unreclaimed acreage remaining at the close of mining. As the pit backfills are reclaimed, some additional habitat for migratory birds and other smaller species of wildlife (i.e., species that are able to access the backfill areas) would be created. Reclamation of backfills that fill the majority of a pit, such as in the Belmont Pit 2, would be more effective in creating habitat accessible to a variety of wildlife, including migratory birds.

Alternative B – Mooney Basin Heap Leach Pad Alternative

Selection of this alternative would result in a reduction in impacts to big sagebrush habitat in the Mooney Basin area but an increase in the size of the 2/3 Heap Leach Pad and associated facilities. For the reasons discussed in the Partial Backfill Alternative section, this alternative would be expected to benefit migrant breeding birds since an area adjacent to relatively undisturbed native habitat at the south end of the Mooney Basin Heap Leach Pad would not be impacted, while habitats that would be disturbed at the BMM heap leach facilities are already fragmented and offer limited potential nesting habitat to migratory birds.

No Action Alternative

Under this alternative, mine development would be limited to that currently authorized. Permitted disturbance would occur, resulting in a total of up to 4,165 acres of disturbance in the BMM and Mooney Basin areas. Active mining in the Proposed Action area would cease in 2009. Disturbance to potential migratory breeding bird habitat in excess of that already disclosed in the BMM 1995 EIS would not occur.

3.8.5 Special Status Wildlife Species Affected Environment

Federally Listed and Proposed Species

Federally listed species are species listed as endangered or threatened by the U.S. Fish and Wildlife Service and species that are proposed for listing by the U.S. Fish and Wildlife Service. The status of threatened and endangered species is determined by the U.S. Fish and Wildlife

Service under the provisions of the Endangered Species Act, as amended. Under the Endangered Species Act, endangered species are defined as being in danger of extinction throughout all or a significant portion of their range. Threatened species are likely to become endangered in the foreseeable future. The U.S. Fish and Wildlife Service also maintains a listing of species or subspecies (i.e., taxa) that may warrant listing as threatened or endangered and for which the U.S. Fish and Wildlife Service has sufficient biological information to support a rule to list as threatened or endangered. These species are referred to as candidate species. Proposed species are species (taxa) for which the U.S. Fish and Wildlife Service has published a proposal to list as threatened or endangered in the Federal Register.

Because the Proposed Action would occur on lands administered by the BLM, the proposal is considered a federal action. Section 7 of the Endangered Species Act stipulates that no federal action shall jeopardize the continued existence of any threatened or endangered species or adversely modify its critical habitat.

With the August 8, 2007, de-listing of the bald eagle (*Haliaeetus leucocephalus*), no federally listed threatened, endangered, or proposed species are known to occur in the Proposed Action area (USFWS, 2007). While no longer listed as threatened or endangered, bald eagles continue to receive protection under the Bald and Golden Eagle Protection Act. Bald eagles occur at the Ruby Lake National Wildlife Refuge during the early winter, and at least one bald eagle regularly overwinters on the refuge (BLM, 1995a). As many as four bald eagles have been present during recent winter seasons (MacKay, 2007). Wintering bald eagles have also been recorded in the valleys surrounding the Proposed Action area (BLM, 1995a; MacKay, 2007).

The Columbia spotted frog, Great Basin Distinct Population Segment, a candidate for listing as threatened or endangered, is known to occur in streams in the Ruby Mountains approximately 25 miles north of the Proposed Action area. In eastern Nevada, the Columbia spotted frog occurs in clear, slow-moving or ponded surface waters with little canopy cover. Habitats where this species is found include springs, lakes, oxbows, beaver ponds, and seeps in wet meadows (Reaser, 1997). A deep silt or muck substrate may be required for hibernation and torpor (Morris and Tanner, 1969). Most occurrences of Columbia spotted frogs in the Ruby Mountains are known from the upper reaches of streams north of Harrison Pass, approximately 25 miles north of the Proposed Action area (Columbia Spotted Frog Technical Team, 2003). The nearest known occurrence of Columbia spotted frogs to the Proposed Action area is an isolated population on the upper reaches of Corral Creek, approximately 23 miles north of the Proposed Action area. SRK Consulting detected no Columbia spotted frogs in the Proposed Action area during seep and spring or springsnail surveys (SRK, 2008). The scarcity of perennial waters in the Proposed Action area, particularly when habitats in the area are compared with the perennially watered habitats to the north that are occupied by spotted frogs, suggests the presence of this species is highly unlikely.

State-Protected Species

Nevada state-protected wildlife species include a number of bats and most diurnal and nocturnal raptors (hawks and owls). Table 3-13 and Table 3-14 list state-protected species that may occur in the area.

The spotted bat (*Euderma maculatum*) is widespread but evidently occurs in low numbers. The spotted bat roosts in crevices on cliffs and has been reported from a variety of elevations and habitats, including ponderosa pine forest, desert scrub, pinyon-juniper, and open pasture (Leonard and Fenton, 1983). Most often, they are found in dry, rough desert terrain (Watkins, 1977). Spotted bat populations may be limited by the availability of suitable roosting sites. The

Revised Nevada Bat Conservation Plan indicates the spotted bat is a species at moderate risk in Nevada (Bradley et al., 2006). Large cliffs are limited in the Proposed Action area, suggesting the presence of spotted bats is unlikely.

TABLE 3-13 NEVADA STATE-PROTECTED, THREATENED, AND SENSITIVE MAMMALS THAT MAY OCCUR IN THE PROPOSED ACTION AREA

COMMON NAME	SCIENTIFIC NAME	STATE STATUS
Spotted bat	*Euderma maculatum*	Threatened
Townsend's big-eared bat	*Corynorhinus townsendii*	Sensitive
Pallid bat	*Antrozous pallidus*	Protected
Fringed myotis	*Myotis thysanodes*	Protected

Defined by Nevada Administrative Code 503.030

The Townsend's big-eared bat (*Corynorhinus townsendii*) is generally a cave dweller. This species often roosts in abandoned mine shafts and adits. The big-eared bat is generally found in desert scrub and pinyon-juniper habitats (Jameson and Peeters, 1988). The species hibernates in cold, well-ventilated places in caves, mine adits, and similar locations (Pierson et al., 1991; Kunz and Martin, 1982). The Revised Nevada Bat Conservation Plan indicates that Townsend's big-eared bat occurrence in Nevada is highly correlated with available cave and abandoned underground mine sites and that the species is at high risk in Nevada (Bradley et al., 2006). Surveys conducted in and near the Proposed Action area (BLM, 1995a; JBR, 2006) have not detected Townsend's big-eared bats, but the species is expected to occur in the area (Bradley, 2007).

The pallid bat (*Antrozous pallidus*) is a large, pale-colored western bat that often preys on large terrestrial insects. Pallid bats roost in a variety of situations, including trees, caves, abandoned mines, and buildings. This species is common in arid habitats (Wilson and Ruff, 1999), with most Nevada occurrences recorded below approximately 8,500 feet (Bradley et al., 2006). Pallid bats are thought to be hibernators (Sherwin, 1998; Bradley et al., 2006). The pallid bat is considered to be a species at moderate risk in Nevada (Bradley et al., 2006). Pallid bats have not been recorded in the Proposed Action area, but the area is within the range of this species and suitable habitat is present if roost sites are available.

The fringed myotis (*Myotis thysanodes*) occurs throughout much of the western United States in a variety of habitats. Oak and pinyon-juniper woodland seem to be favored habitats (Bradley and Ports, 1998). Fringed myotis are colonial and may roost in caves, in underground mines, in buildings, under bridges, and in trees. Hibernation occurs in buildings and underground mines (Bradley and Ports, 1998). According to the Revised Nevada Bat Conservation Plan (Bradley et al., 2006), the fringed myotis is considered to be at high risk in the state. No fringed myotis have been recorded in the Proposed Action area (BLM, 1995a; JBR, 2006), although extensive bat surveys have not been conducted.

Several state-protected birds (Table 3-14) are found primarily in aquatic habitats (e.g., white-faced ibis, white pelican, kingfisher) and would be expected to occur in the Proposed Action area only during migration or as transients. The pigeon hawk, or merlin, is rare in Nevada and would likewise be expected in the Proposed Action area only on rare occasions. Suitable nesting habitat for the northern goshawk (in Nevada, usually in aspen stands along wetted drainages) is lacking in the Proposed Action area.

TABLE 3-14 NEVADA STATE-PROTECTED BIRDS THAT MAY OCCUR IN THE PROPOSED ACTION AREA

COMMON NAME	SCIENTIFIC NAME	STATE STATUS
Bald eagle	*Haliaeetus leucocephalus*	Protected
Southern bald eagle	*Haliaeetus leucocephalus leucocephalus*	Endangered
Golden eagle	*Aquila chrysaetos*	Protected
Merlin (Pigeon hawk)	*Falco columbarius*	Protected
Prairie falcon	*Falco mexicanus*	Protected
Peregrine falcon	*Falco peregrinus*	Endangered
American kestrel (Sparrow hawk)	*Falco sparverius*	Protected
Cooper's hawk	*Accipiter cooperii*	Protected
Ferruginous hawk	*Buteo regalis*	Protected
Northern goshawk	*Accipiter gentilis*	Protected
Northern harrier (Marsh hawk)	*Circus cyaneus*	Protected
Red-tailed hawk	*Buteo jamaicensis*	Protected
Rough-legged hawk	*Buteo lagopus*	Protected
Sharp-shinned hawk	*Accipiter striatus*	Protected
Swainson's hawk	*Buteo swainsoni*	Protected
White-faced ibis (White-faced glossy ibis)	*Plegadis chihi*	Protected
Belted kingfisher	*Ceryle (Megaceryle) alcyon*	Protected
Common nighthawk	*Chordeiles minor*	Protected
Osprey	*Pandion haliaetus*	Protected
Barn owl	*Tyto alba*	Protected
Burrowing owl	*Speotyto (Athene) cunicularia*	Protected
Great horned owl	*Bubo virginianus*	Protected
Long-eared owl	*Asio otus*	Protected
Short-eared owl	*Asio flammeus*	Protected
White pelican	*Pelecanus erythrorhynchos*	Protected
Turkey vulture	*Cathartes aura*	Protected

Defined by Nevada Administrative Code 503.050

Other species on the state-protected list, such as the golden eagle, prairie falcon, sparrow hawk American kestrel (sparrow hawk), northern harrier (marsh hawk), common nighthawk, several of the owl species, and turkey vultures may occur in the Proposed Action area in the appropriate season. According to NDOW, an active golden eagle nest was present in the RBM Pit, but since this pit is now being actively mined, the nest is apparently no longer in use (Lamp, 2007). Golden eagles, like some other raptors, may build more than a single nest and may alternate nesting attempts between nests in different years. These nests are referred to as alternate nests or alternate nest sites. In 1994, a possible golden eagle alternate nest was found on an outcrop in Water Canyon during baseline surveys conducted by JBR (1994) in support of the 1995 EIS. NDOW has no record of an active nest in this area. As described below, ferruginous hawks are known to nest near the Proposed Action area. However, baseline surveys conducted by SRK Consulting (2008) have detected no nests within the Proposed Action area. Swainson's hawks may occur in the surrounding valleys during the summer season, while rough-legged hawks may occur during the winter and early spring. Golden eagles, prairie falcons, and turkey vultures usually nest on cliffs or outcrops. Such features are limited in the Proposed Action area, though eagles may also nest in trees. American kestrels are cavity nesters. American kestrels were not recorded nesting in the Nevada Breeding Bird Atlas Block located just south of the Proposed Action area but may nest in the area. American kestrels, as well as Cooper's and sharp-shinned hawks, were recorded in Water Canyon during JBR (1994) baseline surveys. Northern harriers typically nest on the ground in marshy habitats. Such habitats are lacking in the Proposed Action area but occur in the surrounding valleys. Northern harriers may forage in the Proposed Action area. Northern harriers and red-tailed hawks were recorded in the Proposed Action area during baseline surveys conducted by JBR (1994). Common nighthawks occur in northern Nevada only during the warmer months. This species nests on the ground and may nest in the Proposed Action area. Most owls nest in trees or outcrops, though short-eared owls nest on the ground and burrowing owls nest underground. Short-eared owls may nest in the Proposed Action area, though nesting by this species has not been documented.

BLM Sensitive Species
In addition to federally listed or proposed species and Nevada state-protected species, the BLM maintains a list of Nevada sensitive species. The BLM Manual 6840.06 E states that native species may be listed as sensitive if the species:

- Could become endangered or extirpated from a state, or within a significant portion of its range in the foreseeable future;
- Is under review (for listing as threatened or endangered) by the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service;
- Is undergoing significant current or predicted downward trend in habitat capability that would reduce the species' existing distribution and/or population or density such that federally listed, proposed, or state-listed status may become necessary;
- Typically consists of small and widely dispersed populations;
- Inhabits ecological refugia, or specialized or unique habitats; and
- Is state listed but may be better conserved through application of BLM sensitive species status.

The BLM affords these species the same level of protection as federal candidate species had formerly. The BLM's policy for sensitive species is to avoid authorizing actions that would contribute to the listing of a species as threatened or endangered.

BLM sensitive species potentially occurring in the Proposed Action area include several species of bats, the pygmy rabbit (*Brachylagus idahoensis*), and a number of bird species (Appendix G). Two species of reptiles, the short-horned lizard (*Phrynosoma douglassii*) and the mountain king snake (*Lampropeltis pyromelana*), have been recorded only east of the Proposed Action area (Stebbins, 1985). No fisheries occur in the Proposed Action area.

In addition to state-protected bat species, BLM sensitive bat species that may occur in the Proposed Action area include the big brown bat (*Eptesicus fuscus*), the silver-haired bat (*Lasionycteris noctivagans*), the hoary bat (*Lasiurus cinereus*), a number of myotis bats, the western pipistrelle (*Pipistrellus hesperus*), and the Mexican free-tailed bat (*Tadarida brasiliensis*).

The big brown bat occurs over a wide range of habitats. The species roosts in caves, mines, buildings, and other situations. The species is a hibernator but may migrate elevationally in some areas (Perkins, 1998a). The Revised Nevada Bat Conservation Plan indicates the big brown bat is a species at low risk in Nevada (Bradley et al., 2006). The Proposed Action area is within the range of the big brown bat, but the species has not been recorded in the area.

The silver-haired bat is usually found in forested habitats, where the bat roosts in trees. The species is known to hibernate in hollow trees, under bark, and in leaf litter, as well as in buildings, mines, and caves (Perkins, 1998b). Portions of the population may be migratory (Wilson and Ruff, 1999). The silver-haired bat is considered to be a species at moderate risk in Nevada (Bradley et al., 2006). Silver-haired bats have not been documented in the Proposed Action area but may occur in areas of pinyon-juniper habitat.

The hoary bat is a large, solitary bat that typically roosts in deciduous or coniferous trees. The species occurs over much of the United States. In the west, hoary bats usually occur in forested habitats. Hoary bats are migratory and may move in large groups in the fall, with spring migration. This species is apparently more solitary in nature (Bolster, 1998). The Revised Nevada Bat Conservation Plan indicates the hoary bat is a species at moderate risk in Nevada (Bradley et al., 2006). Limited bat survey work has been conducted in the area (BLM, 1995a; JBR, 2006), but no hoary bats have been recorded.

Several species of bats in the genus *Myotis* occur or may occur in the area. Two myotis species, the western small-footed myotis (*Myotis ciliolabrum*) and a single long-eared myotis (*Myotis evotis*), were found hibernating in the underground workings of the Little BMM in March 2006 (JBR, 2006). The small-footed myotis occurs in deserts, chaparral, riparian zones, and forests but is most common in pinyon-juniper habitat. The long-eared myotis also occurs in a variety of habitats but is most often associated with coniferous forest. This species also utilizes a variety of roost locations (Bogan et al., 1998a). Long-eared myotis were recorded at Buck Spring (north of Overland Pass) and approximately nine miles north of the Proposed Action area, in 1994 (BLM, 1995a).

Other species of myotis bats that have not been recorded but that may occur in the area include the California myotis (*Myotis californicus*), the little brown myotis (*Myotis lucifugus*), the fringed myotis (*Myotis thysanodes*) (discussed above), the long-legged myotis (*Myotis volans*), and the Yuma myotis (*Myotis yumanensis*). The California myotis occurs in a variety of habitats throughout the west, including arid areas. Roost habitats are also varied and include caves and mines, the bark of trees, under rocks, and in buildings. California myotis hibernate in winter but may be active even at temperatures below freezing (Bogan et al., 1998b). The little brown myotis is a widely distributed species that occurs in mesic or forested habitats. The species is usually absent from hot, arid lowlands (Rainey, 1998). Little brown myotis roost in tree cavities, caves, and buildings, with caves and abandoned underground mines utilized as hibernation sites (hibernacula).

The long-legged myotis usually occurs in forested habitats throughout the western United States but may be found in drier situations, including desert habitat. The species uses a variety of roost sites during the warmer season and hibernates in caves and underground mines (Bogen et al., 1998c). Long-legged myotis were recorded at Buck Spring and near the Bellview Mine in 1994 (BLM, 1995a). The Yuma myotis is often associated with water, including small ponds, lakes, and streams. Yuma myotis may roost in buildings, in caves, in trees, and under bridges (Bogen et al., 1998d). Yuma myotis lack the adaptations to arid environments shown by some other myotis species (Wilson and Ruff, 1999).

According to the Revised Nevada Bat Conservation Plan (Bradley et al., 2006), most species of myotis in Nevada (with the exception of the fringed myotis, as noted above) are considered to be species at moderate risk.

Western pipistrelles are the smallest of North American bats. The species occurs throughout much of the west and southwest, roosting in cliffs and outcrops, typically near permanent sources of water (Wilson and Ruff, 1999). Western pipistrelles hibernate in rock crevices (Brown, 1998). Bradley et al. (2006) indicate the western pipistrelle is a species at moderate risk in Nevada. The limited amount of free water in the Proposed Action area may limit use of the area by western pipistrelles.

The Mexican free-tailed bat is widely distributed across the southern and central United States and Mexico (BCI, 1998). The bats roost in caves, in abandoned underground mines, in buildings, in hollow trees, and under bridges. The species is migratory. Mexican free-tailed bats are highly colonial and form maternity colonies that may number in the millions of individuals (BCI, 1998). Mexican free-tailed bats are strong fliers and may travel long distances from roosting sites to forage. The Mexican free-tailed bat is considered to be a species at low risk in Nevada (Bradley et al., 2006). As is the case with several of the above species, Mexican free-tailed bats have not been recorded in the Proposed Action area.

Pygmy rabbits forage on sagebrush and construct underground burrow systems. Typically, pygmy rabbits occur in habitats dominated by mature, dense stands of big sagebrush and green rabbitbrush found in relatively level areas of deep, soft soil (Katzner and Parker, 1997). Based on known habitat requirements and results of previous surveys in the area, SRK Consulting modeled pygmy rabbit habitat in and near the Proposed Action area (SRK, 2008). The model has subsequently been corroborated by numerous field studies. At elevations below 7,000 feet above mean sea level, suitable pygmy rabbit habitat was identified as areas with soils greater than 40 inches deep, slopes of less than 15 percent, and big sagebrush as the dominant shrub. Suitable habitat above 7,000 feet above mean sea level was identified as including the same soil depth and slope parameters and, again, dominated by big sagebrush but also including position on the slope and the area (extent) of suitable habitat. Concave slopes and toe slopes were utilized, as were sagebrush patches larger than 10 acres in size. Areas of shallow soils were not utilized. Mapping based on the SRK Consulting (2008) model identifies pygmy rabbit habitat in the valleys surrounding the Proposed Action area, but potential habitat is much more limited at higher elevations of the Proposed Action area. The largest area of potential habitat within the Proposed Action area is located in the western part of the area (Figure 3-14).

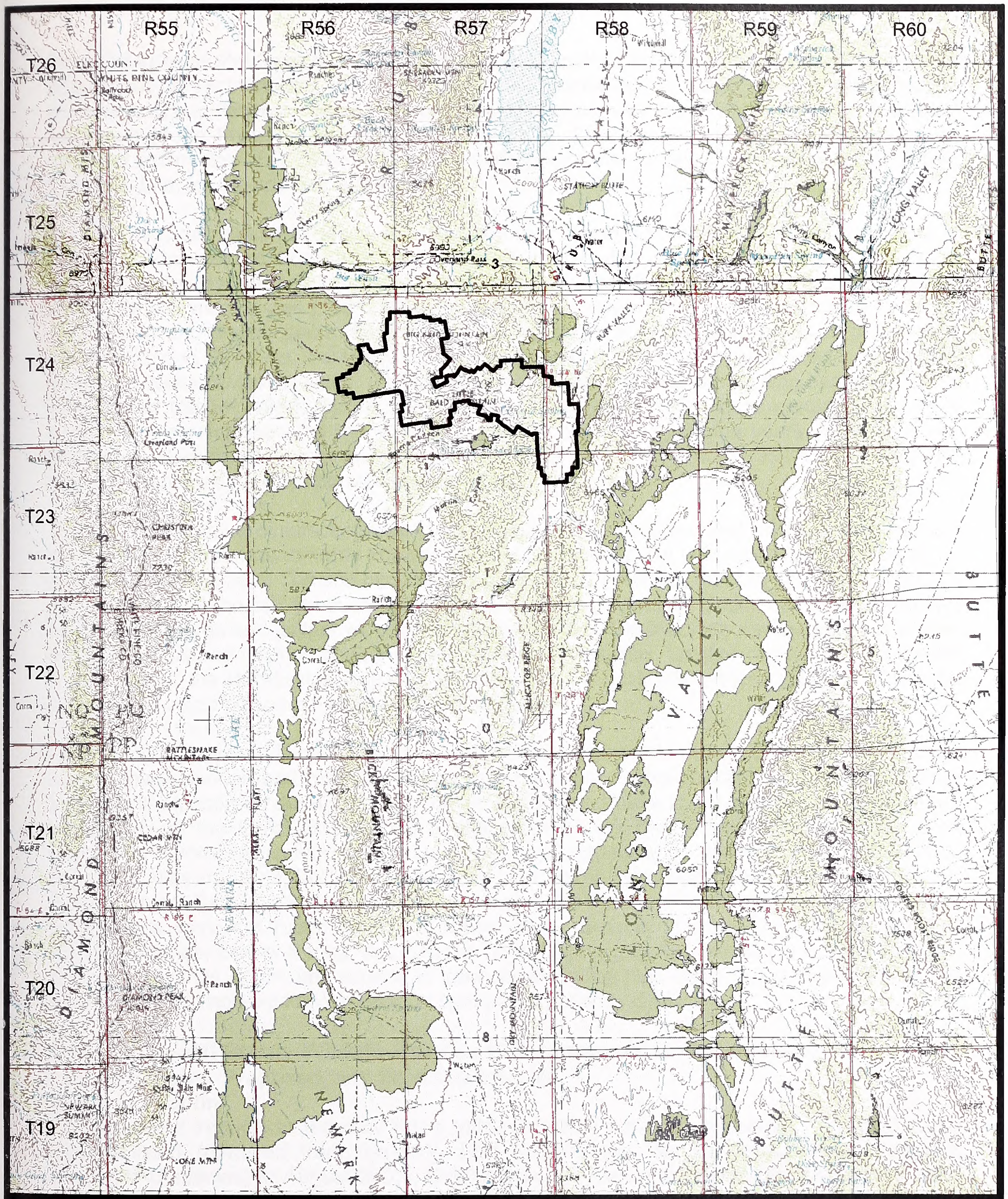
In pinyon-juniper habitats of the Great Basin, ferruginous hawks typically nest in juniper trees along the forest-shrubland edge, often in the furthest extension of trees out into the adjacent shrubland habitats (Howard and Wolfe, 1976; Smith and Murphy, 1982). As noted in the BMM EIS (BLM, 1995a), "the Egan Resource Area is the most important resource area within the State for ferruginous hawks, with Newark Valley supporting the greatest number of breeding pairs." Also stated in the BMM EIS (BLM, 1995a), the numbers of ferruginous hawk nests in the area declined markedly between the early 1980s and 1994. Important nesting areas near the Proposed Action area are identified west of Buck Mountain in Newark Valley and east of Alligator Ridge in Long Valley. Ferruginous hawks prey heavily on ground squirrels. Because their principal prey (ground squirrels) enters aestivation by late July or early August, ferruginous hawks typically fledge young and leave the area by early August (SRK, 2008). Terrestrial surveys conducted by SRK Consulting (2008) have detected no ferruginous hawk nests within the Proposed Action area (SRK, 2008).

Western burrowing owls generally inhabit open areas with low vegetation. This owl species was listed as a Category 2 candidate species for consideration to be listed as a threatened or endangered species in the BMM 1995 EIS; however, in 1996, the Category 2 designation was discontinued. The owls utilize underground burrows for nesting and shelter. Nesting areas characteristically include an elevated perch site or sites, such as fence posts, utility poles, or mounds of earth. Burrowing owls may be active throughout the day, with activity peaks near dawn and into the early morning, and near dusk. The burrowing owl is a migratory species in the northern portion of its range and a year-round resident in the south and is federally protected under the Migratory Bird Treaty Act. Ryser (1985) states most burrowing owls in the Great Basin are migratory. Potential burrowing owl habitat is located in the valleys surrounding the Proposed Action area. No burrowing owl nests have been located within the Proposed Action area (SRK, 2008).

Greater sage-grouse occur in sagebrush habitats in the Great Basin and in similar habitats in the western United States. During the winter season, the birds subsist almost entirely on sagebrush. During the spring season, males gather to display or "strut" on communal strutting grounds, or leks. Most sage-grouse leks are situated on level ground or on gently sloping hillsides. Most are located in open areas away from trees and other potential raptor perches. Females come onto strutting grounds to mate and subsequently nest, usually within two miles of the lek. Wet meadow and riparian areas are utilized as brood-rearing habitats. These mesic areas, including seep and spring sites, provide a crucial source of insects and succulent forage for young birds. Together, the strutting grounds and nesting and brood-rearing areas form a sage-grouse habitat complex that may encompass areas from valley floors or benches up into the mountains, to include mountain meadow habitats. The White Pine County portion of the Sage-grouse Conservation Plan (NDOW, 2004) notes that the White Pine-Lincoln county area has been divided into four sage-grouse population management units. Each population management unit includes a geographical subunit that contains a largely separate sage-grouse population. The Proposed Action area is located within the Butte Valley/Buck Mountain/White Pine Range Population Management Unit. The greatest concentration of nesting and early and late brooding habitat in this large population management unit is located in the White Pine Range south of U.S. Highway 50. The Buck Mountain area, south of the Proposed Action area, is also identified as an important sage-grouse area. The closest sage-grouse leks are located several miles from the Proposed Action area, in southern Ruby Valley to the north, in Long Valley to the southeast (BLM, 1995a), and below the mouth of Bourne Canyon (Lamp, 2007). Juniper encroachment has reduced potential sage-grouse habitat in the Proposed Action area (NDOW, 2004), and the lack of extensive riparian or wet meadow habitat limits the amount of summer (brood-rearing) habitat present in the Proposed Action area (SRK, 2008).

The peregrine falcon was identified as a potential breeder on the Nevada Breeding Bird Atlas Block located just south of the Proposed Action area (Floyd et al., 2007). Tall cliffs (potential peregrine falcon nesting sites) are limited in the immediate Proposed Action area, suggesting nesting by peregrine falcons within the Proposed Action area is unlikely. Peregrine falcons are rarely reported at the Ruby Lake National Wildlife Refuge, northeast of the Proposed Action area (MacKay, 2007). The Ruby Lake National Wildlife Refuge area probably represents the best potential peregrine falcon foraging habitat in the surrounding area. The lack of regular sightings of peregrine falcons at the refuge suggests nesting does not occur in the area. Peregrine falcons may pass through the area during migration, but the species is not expected to linger.

In the Great Basin, loggerhead shrikes (*Lanius ludovicianus*) are typically associated with greasewood (Grant et al., 1991) and sagebrush communities (McAdoo et al., 1989). They also frequent open country in valleys and foothills, juniper or pinyon-juniper woodlands, mahogany stands, and the edges of ranches and towns (Ryser, 1985). Dense stands of trees and shrubs are used for nesting and roosting sites, as well as for hunting perches (Ryser, 1985). Nests are usually built between three and 30 feet above the ground in a tree crotch or on top of an old nest, often in dense twigs or foliage (Fraser and Luukkonen, 1986). Shrikes hunt where tall vegetation is scattered and there is much bare ground or ground covered with short vegetation. They often hunt from telephone wires and fences (Ryser, 1985). These small predators are known to prey on rodents, insects, and even on other small birds, often impaling their catch on



Legend

- North Operations Project Boundary
- Potential Pygmy Rabbit Habitat

N

0 15,000 30,000

Feet

1:360,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-14
POTENTIAL PYGMY RABBIT HABITAT

thorns of trees or shrubs or on barbed wire fences. Grant et al. (1991) found loggerhead shrike populations in northeastern Utah were positively correlated with deer mouse (*Peromyscus maniculatus*) populations. No nesting loggerhead shrikes were found in the atlas block located just south of the Proposed Action area (Floyd et al., 2007), and no evidence of nesting was recorded during the JBR 1994 or SRK Consulting baseline surveys (JBR, 1994; SRK, 2008), though habitat for the species is present.

Ryser (1985) describes the pinyon jay (*Gymnorhinus cyanocephalus*) as a common resident of the Great Basin, where it occupies pinyon and juniper habitats. Pinyon jays forage on pine nuts and juniper berries and practice caching behavior, which involves burying seeds in the ground. Ryser (1985) and Lanner (1981) describe the close relationship that has evolved between pinyon jays and pinyon pines (both single-leaf and two-leaf, or Colorado, pinyon pine, *Pinus monophylla* and *P. edulis*, respectively). The pinyon jay is a highly social species and typically is seen in flocks of various sizes. The birds nest in loose colonies, with nesting beginning in the early spring (Alcorn, 1988; Ryser, 1985). Ryser (1985) states the flocks generally occupy a specific home range but that the birds may wander nomadically during years of low pine nut production. Pinyon jays were recorded in the area of the Galaxy Pit in 1994 (JBR, 1994) and would be expected to utilize pinyon-juniper habitats in the area.

The juniper titmouse occurs in juniper and pinyon-juniper habitats east of the Sierra Nevada crest. This species was formerly known as the plain titmouse but was recently “split” (identified as a separate species). Titmice occurring in primarily oak habitats west of the Sierra crest are now identified as the oak titmouse (*Baeolophus inornatus*). Juniper titmice occur as year-round residents in pinyon and juniper woodlands (Ryser, 1985). The birds are cavity nesters and may utilize either natural cavities or abandoned woodpecker cavities. Juniper titmice were recorded in the area of the Horseshoe, Saga, and Galaxy pits in 1994 (JBR, 1994) and would also be expected to utilize pinyon-juniper habitats in the area.

The BLM has expressed concern about impacts to springsnails in the Great Basin. These small snails inhabit springs and other persistent water sources. Springsnails are believed to have been more widespread during wetter geologic periods and have subsequently become isolated as habitats in the Great Basin dried at the close of the Pleistocene (Sada, 2004). SRK Consulting surveyed springs in the area for the presence of springsnails (SRK, 2008). Surveyed sites included Cracker Johnson #1 and #2 springs, upper and lower Mill springs, South Water Canyon Spring, Cherry Spring, and Bourne Tunnel Spring (Figure 3-2). Springsnails were not found at any of these sites. Several of these springs (the Cracker Johnson springs, Cherry Spring, and Bourne Tunnel Spring) lacked flow at the time of the 2007 surveys. Springs which are subject to occasional drying (i.e., have not persisted since the Pleistocene) are not expected to support springsnails (Sada, 2004).

3.8.6 Special Status Wildlife Species Environmental Consequences

Federally Listed, Proposed, and Sensitive Species

Proposed Action

Environmental impacts to federally listed animal species are not anticipated. The bald eagle was de-listed (removed from the U.S. Fish and Wildlife Service list of threatened and endangered species) in August 2007. Bald eagles are known to overwinter at the Ruby Lake National Wildlife Refuge (BLM, 1995a; MacKay, 2007). Bald eagles continue to receive protection under the Bald and Golden Eagle Protection Act of 1940. Bald eagle occurrence is considered unlikely in the Proposed Action area due to the limited amount of surface water and lack of large trees that could be used as roost sites in the area. Therefore, the Proposed Action is not expected to contribute toward re-listing of the species.

Like the bald eagle, the scarcity of perennial waters in the Proposed Action area suggests the presence of Columbia spotted frogs is highly unlikely, and none were found in or near the Proposed Action area. Therefore, the Proposed Action is not expected to contribute toward the listing of this species.

Alternative A – Partial Backfill Alternative
Because no listed or proposed species are known to occur in the Proposed Action area, impacts under this alternative are expected to be the same as those under the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Because no listed or proposed species are known to occur in the Proposed Action area, impacts under this alternative are expected to be the same as those under the Proposed Action.

No Action Alternative
Because no listed or proposed species are known to occur in the Proposed Action area, selection of this alternative is not expected to benefit or harm any of these species.

State-Protected Species
Proposed Action
Anticipated environmental impacts to state-protected species include loss of habitat and displacement from human disturbance, as described below.

The Proposed Action would directly impact potential bat foraging habitat and roosting habitat for tree-roosting bats. Large cliffs that may be utilized as roost sites by spotted bats are limited in the Proposed Action area. Both the Townsend's big-eared bat and the pallid bat are strong fliers, and impacts to vegetation may reduce potential foraging habitat used by these state sensitive species as well as other bat species.

Baseline surveys (SRK, 2008) have found no state-protected raptor nest sites within the Proposed Action area. Terrestrial surveys conducted by SRK Consulting (2008) have detected no ferruginous hawk nests within the Proposed Action area. The Proposed Action would result in reductions in foraging habitat for diurnal raptors, owls, and turkey vultures. Successful reclamation would eventually reduce these impacts. Approximately 540 acres of open pit would not be reclaimed, but pit high walls represent potential roosting habitat for bats and potential nesting habitat for diurnal raptors, several species of owls, and potentially for turkey vultures.

The peregrine falcon was identified as a potential breeder on a Nevada Breeding Bird Atlas Block located just south of the Proposed Action area (Floyd et al., 2007). The lack of regular sightings of peregrine falcons at the Ruby Lake National Wildlife Refuge suggests nesting by peregrine falcons does not occur in the area.

Potential indirect effects to state-protected species that could result from implementation of the Proposed Action include displacement of wildlife, including bats and/or raptors, into adjacent habitats. Such a change in utilization could result in increased competition for limited resources. As noted above, this increased competition could result in mortality for some individuals. In the case of tree-roosting bats, considerable alternate roosting habitat is available on lands surrounding the Proposed Action area. Also as noted above, this displacement may be considered temporary provided reclamation creates habitats similar to those that were disturbed by the proposed activity. If reclamation creates a habitat different from that originally present (replacement of a pinyon-juniper community with a shrub-grass community, for example), some species may be permanently displaced and others may benefit.

Alternative A – Partial Backfill Alternative
Reductions in impacts to pinyon-juniper habitat may slightly benefit tree-roosting bats. Such reductions in impacts could occur in the area of the North 2 Rock Disposal Area. Impacts to state-protected birds are expected to be minimal under Alternative A. Reduction in rock disposal area size would have little impact on these species. Pit backfills may slightly reduce potential bat roosting habitat in pit walls, but unreclaimed pits would continue to offer potential bat roosting habitat.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Habitats in Mooney Basin that would remain undisturbed, if this alternative was selected, are predominantly sagebrush habitats. Selection of this alternative is therefore expected to have little effect on potential bat habitat. Reduction in the size of the Mooney Basin Heap Leach Pad would reduce the area of impact on potential diurnal and nocturnal raptor habitat.

No Action Alternative
Disturbance to potential bat and bird habitat in excess of that already permitted would not occur.

BLM Sensitive Species
Proposed Action
Anticipated environmental impacts to BLM sensitive species include loss of habitat and displacement from human disturbance, as described below.

Impacts to vegetation may reduce foraging habitat for bats in the area. Impacts to pinyon-juniper woodland would reduce the amount of potential roosting habitat available for tree-roosting bats (including the BLM sensitive species identified above and in Appendix G).

Potential pygmy rabbit habitat (described in Section 3.8.5) occurs in the valleys surrounding the Proposed Action area but is limited within the Proposed Action area. As shown in Figure 3-14, the largest area of potential pygmy rabbit habitat is located in the western portion of the Proposed Action area. Areas of potential pygmy rabbit habitat (as identified by SRK [2008]) that would be disturbed by the Proposed Action would be surveyed for the presence of pygmy rabbits prior to any disturbance. Because areas of proposed disturbance are on the margins of occupied habitat, or have previously been subject to disturbance, any losses are not expected to contribute to a trend toward listing this species.

Sage-grouse may utilize mesic areas as brood-rearing habitat. Water sources and associated wetland/mesic habitats would be avoided by design, but impacts to sagebrush habitats may reduce potential sage-grouse habitat in the area. Impacts to sage-grouse are expected to be minimal, since there are no known leks within the Proposed Action and reduction in overall sagebrush habitat would be a small portion of available habitat. Removal of pinyon-juniper habitat could have a positive impact on sage-grouse if the result was an increase in sagebrush habitat.

Impacts to big sagebrush habitat within the Proposed Action area may result in slight reductions in ferruginous hawk foraging habitat (no ferruginous hawk nests are known to be present in the Proposed Action area). Removal of large shrubs or small trees would reduce potential loggerhead shrike nesting habitat, though fencing and power lines may provide additional shrike perch sites. Impacts to pinyon-juniper habitat would reduce available habitat for pinyon jays, juniper titmice, and other forest-dependant and cavity-nesting species. Reductions in habitat would result in displacement of some species and a reduction in carrying capacity, while other species would experience only temporary displacement. The burrowing owl is unlikely to be affected because suitable habitat is limited in the Proposed Action area and much remains outside the area.

Potential indirect effects to BLM sensitive species are similar to those for other wildlife. Specifically, implementation of the Proposed Action could result in displacement of sensitive species into adjacent habitats. Such a change in area of utilization could result in increased competition for limited resources. In the case of species such as tree-roosting bats, considerable alternate roosting habitat is available on lands surrounding the Proposed Action area. Impacts to occupied pygmy rabbit habitat are expected to be minimal.

Migratory and resident birds that utilize defended territories would appear to be the most susceptible to indirect impacts, as adjacent undisturbed habitats would probably be already occupied.

Alternative A – Partial Backfill Alternative
Reductions in impacts to pinyon-juniper habitat may slightly benefit tree-roosting bats. The total area of vegetation removal for this alternative is approximately 434 acres less than with the Proposed Action. The reduction in vegetation loss would be a result of smaller waste rock disposal areas. SRK Consulting's model of pygmy rabbit habitat indicates no pygmy rabbit habitat is present in the area of the rock disposal areas. Surveys conducted by SRK Consulting (2008) detected no ferruginous hawks or burrowing owls in the Proposed Action area. Selection of this alternative would have no effect on these BLM sensitive species. The effects of reducing the size of rock disposal areas and backfilling portions of some pits on BLM sensitive migratory birds would be similar to those described for other migrant bird species (see Section 3.8.4).

Alternative B – Mooney Basin Heap Leach Pad Alternative
Potential pygmy rabbit habitat is identified east of the proposed Mooney Basin Heap Leach Pad expansion. Pygmy rabbit habitat is identified in the area of the 2/3 Heap Leach Pad, though this habitat may not be occupied. Selection of this alternative may minimize impacts near pygmy rabbit habitat in Mooney Basin but would increase the amount of disturbance in potential pygmy rabbit habitat in the western BMM facilities area.

No Action Alternative
Under this alternative, new mine development at the BMM and Mooney Basin areas would not occur. Disturbance to potential BLM sensitive species habitat, primarily sensitive migratory breeding bird habitat, in excess of that already permitted, would not occur.

3.9 Wetlands, Riparian Zones, Waters of the U.S.

Wetlands and riparian zones are particularly important habitats in the dry environment of the Great Basin. Aquatic habitats such as seeps, springs, and streams serve as water sources for wide-ranging wildlife and range species. Associated wetland and riparian habitats support other species that occur only in or near these vegetation communities. Riparian habitats (deciduous shrub or tree species that border rivers and streams) support a variety of avian species not found in surrounding drier areas. Game birds, including sage-grouse, utilize streamside and wet meadow habitats as brood-rearing areas, where young birds can obtain high protein insect forage and succulent vegetation. Wetlands provide water filtration and soil stabilization functions, as well as habitat benefits.

Assumptions for Analysis
Assumptions made for the wetland, riparian zones, and waters of the U.S. analysis include the following:

- The U.S. Army Corps of Engineers will concur with the finding that there are no jurisdictional waters of the U.S. (including jurisdictional wetlands) within the Proposed Action area.

3.9.1 Wetlands Affected Environment

A wetland is an area such as a seep, spring, or wet meadow in which the soil or substrate is at least periodically saturated with or covered by water. The saturation affects the type of soils that develop and the plant species that can survive there. Furthermore, if a wetland meets specific criteria (regarding hydrology and the types of soil and vegetation present) it can fall under the jurisdiction of the Clean Water Act and be regulated as a jurisdictional water of the U.S. This section discusses non-jurisdictional wetlands; jurisdictional waters of the U.S. (including jurisdictional wetlands) are discussed in Section 3.9.5.

Wetlands are limited in the Proposed Action area. Springs located within the Proposed Action area include Cherry Spring, South Water Canyon Spring, and Upper and Lower Mill springs (Figure 3-2). In 1994, JBR conducted a wetland and seep and spring delineation in the Water Canyon area (JBR, 1995). Tetra Tech has monitored seeps and springs in and near the Proposed Action area since the fourth quarter of 2005. A 2007 report on this monitoring describes seep, spring, and well sites in the area (Tetra Tech, 2007).

Baseline surveys performed by JBR in Water Canyon in 1994 identified three spring sites JBR, 1995). Two, including a site in a tributary canyon north of Water Canyon, were small sites that supported less than 1,000 square feet of hydrophytic vegetation. Hydrophytic vegetation is plant life that grows in water or on a substrate that is, at least periodically, deficient in oxygen as a result of excessive water content. Hydrophytic vegetation is one indicator that is used to identify the presence of wetlands. South Water Canyon Spring, the third and lowest-elevation site, included approximately 12,400 square feet (0.28 acre) of hydrophytic vegetation. Flow from this site supports a stock pond in Water Canyon. A small depression that accumulates snow melt and precipitation is located on the upper slopes south of upper Water Canyon. The site does not possess vegetation seen at other area springs and dries by early summer (Zietlow, 2007b, 2007d).

South Water Canyon Spring, the larger spring site surveyed by JBR in 1994, was flowing when surveyed in July 2007 and appeared to be perennial (SRK, 2008). Tetra Tech (2007) recorded flows of six to 10 gallons per minute from this site and noted vegetation at the site was quite thick. Flow from this site collects in a stock pond located approximately 1,000 feet below this spring. The small Upper Water Canyon site was not included in the Tetra Tech surveys.

Upper and lower Mill springs, located north of Water Canyon, were both flowing when surveyed in July 2007 (SRK, 2008). The springs appear to be perennial, though limited flow issued from Upper Mill Spring when the sites were surveyed. Tetra Tech (2007) documented flows at Lower Mill Spring ranging from approximately 1.2 gallons per minute in May 2007 to 5.7 gallons per minute in March 2006. Lower Mill Spring supports a small area of hydrophytic vegetation. A flow of 1.5 gallons per minute was found at Mill Spring in November 2005, but no flow was present at the site in May 2007 (Tetra Tech, 2007).

Small isolated wetland areas are associated with seeps and springs in the Proposed Action area (JBR, 1994; Tetra Tech, 2007). All wetlands in the Proposed Action area are isolated and lack a defined channel or significant connection (nexus) to potentially jurisdictional waters downstream.

3.9.2 Wetlands Environmental Consequences

Proposed Action

Potential impacts to wetlands include direct impacts from ground disturbance and indirect impacts that could result from actions that affected surface flow or spring recharge rates, as described below.

Few wetlands exist in the Proposed Action area. Direct impacts to wetlands in the Proposed Action area would be avoided by design (Table 2-13). Potential indirect impacts to seeps and springs include possible increases in erosion, changes in chemistry of water draining though rock disposal areas, and alteration of recharge areas. Design Features (Table 2-13) would minimize potential indirect impacts. As described in Section 3.2, Water Resources, expansion of the East Sage Rock Disposal Area and construction of the Sage Flat Rock Disposal Area may reduce or delay recharge to Cherry Spring. However, this spring has not flowed in recent years and no impacts to surface water flow from this site are anticipated.

Alternative A – Partial Backfill Alternative

Impacts to wetlands would be essentially the same as for the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative

Impacts to wetlands would be the same as those that would occur under the Proposed Action because no wetlands have been identified in the vicinity of the proposed Mooney Basin Heap Leach Pad.

No Action Alternative

Under this alternative, activities associated with the Proposed Action would not occur. No impacts to wetlands would occur under this alternative, other than those already authorized.

3.9.3 Riparian Zones Affected Environment

Riparian zones include plant species such as willow (*Salix* sp.) and cottonwood (*Populus* sp.) that border rivers and streams. No riparian habitat has been identified within the Proposed Action area.

3.9.4 Riparian Zones Environmental Consequences

Proposed Action

No riparian habitat has been identified in the Proposed Action area; therefore, implementation of the Proposed Action would have no impact on riparian zones.

Alternative A – Partial Backfill Alternative

Impacts to riparian zones would be the same as under the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative

Impacts to riparian zones would be the same as under the Proposed Action.

No Action Alternative

Under this alternative, activities associated with the Proposed Action would not occur. No impacts to riparian zones would occur under this alternative.

3.9.5 Waters of the U.S. Affected Environment

Waters of the U.S. are defined by 33 Code of Federal Regulations 328.3 as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

- All interstate waters including interstate wetlands;

- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce.

In 2001, the U.S. Supreme Court ruled in the Solid Waste Agency of Northern Cook County case that the U.S. Army Corps of Engineers cannot invoke migratory bird use as the sole basis to establish jurisdiction over certain isolated waters of the U.S., including isolated wetlands. Prior to the ruling, the U.S. Army Corps of Engineers considered migratory bird use of isolated wetlands to be a tie to interstate or foreign commerce and thus claimed jurisdiction of isolated water bodies and wetlands. The Solid Waste Agency of Northern Cook County determination found that wetlands that are not adjacent to, and do not share a physical connection with, an otherwise jurisdictional water body could be considered isolated and not subject to jurisdiction by the U.S. Army Corps of Engineers. Likewise, drainages that did not have a tributary connection to a jurisdictional water body would also be considered isolated and not subject to jurisdiction.

Drainages in the Proposed Action area were surveyed for a defined channel connection to other downstream waters and for other potential connections to interstate commerce. Channels running southwest from the Proposed Action area, including Water and Bourne canyons, drain to Newark Valley. Channels draining southeast drain to Long Valley. Both Newark Valley and Long Valley are closed basins, and channels draining to these basins lack ties to interstate commerce. Channels draining northwest from the Proposed Action area are located within the Huntington Creek watershed. Huntington Creek ultimately drains to the Humboldt River, and drainages sharing a defined channel connection to Huntington Creek could be considered jurisdictional features. Channels draining to the northeast enter Ruby Valley. Recreation at the Ruby Lake National Wildlife Refuge could be considered an activity that involves interstate commerce. In both of these cases channels draining the mine area were found to lose definition prior to reaching any water that could support interstate commerce. Documentation demonstrating that drainages in the Proposed Action area are isolated and not subject to regulation under the Clean Water Act has been provided to the U.S. Army Corps of Engineers for review and verification.

3.9.6 Waters of the U.S. Environmental Consequences

Proposed Action

A survey of drainages in the Proposed Action area determined that no waters in the Proposed Action area share a defined channel connection or other significant connection (nexus) with potentially jurisdictional waters downstream. Therefore, there would be no impacts from the Proposed Action.

Alternative A – Partial Backfill Alternative

Impacts to waters of the U.S. would be the same as with the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative

Impacts to waters of the U.S. would be the same as with the Proposed Action.

No Action Alternative
Under this alternative, activities associated with the Proposed Action would not occur and there would be no impacts to jurisdictional waters of the U.S.

3.10 Range Resources

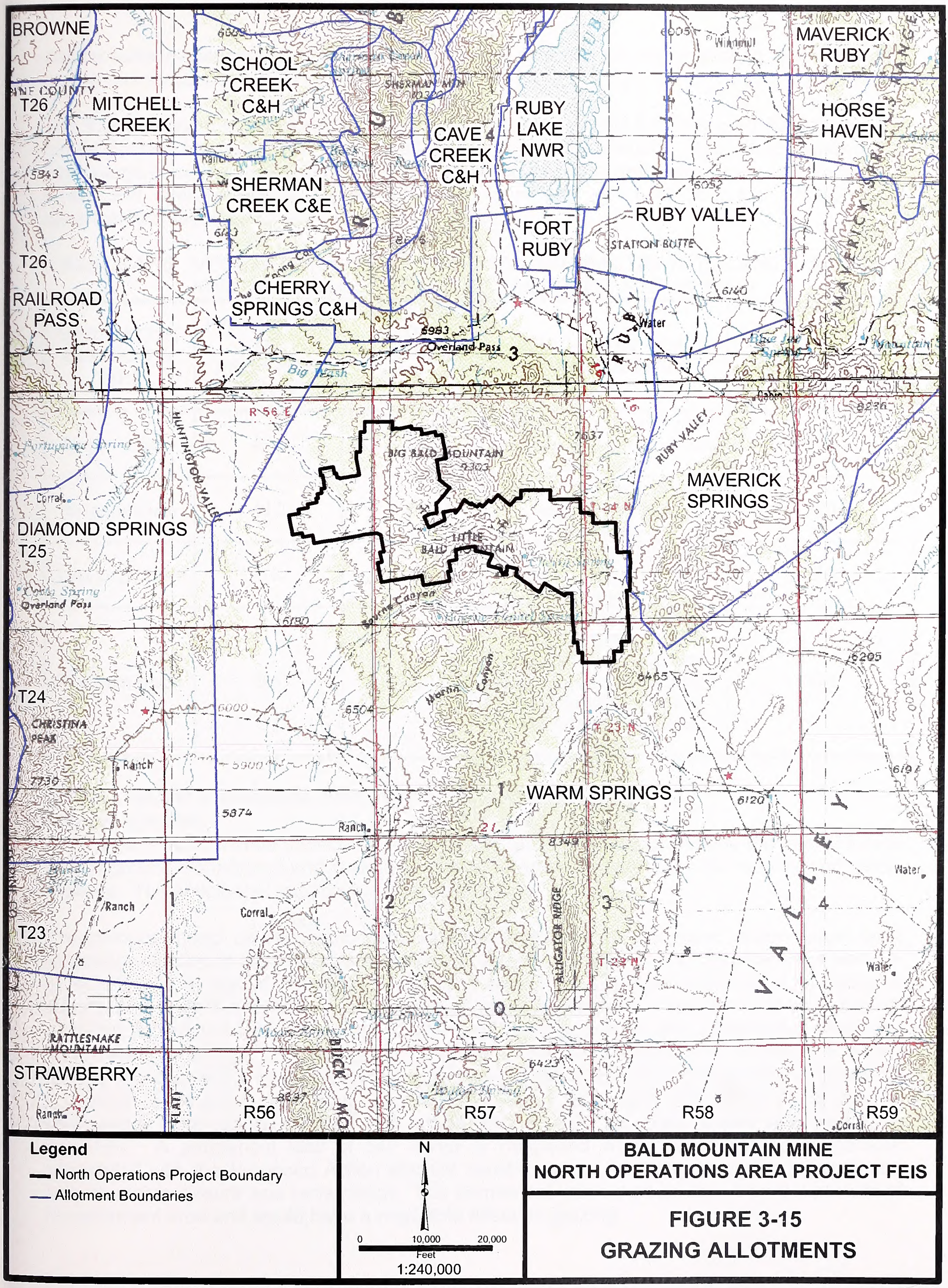
The following section presents the range resources affected environment and environmental consequences.

3.10.1 Range Resources Affected Environment

The Proposed Action area lies entirely within the Warm Springs livestock grazing allotment (Figure 3-15), in the northwest corner of White Pine County. Active mining areas within this allotment are not open to livestock grazing. The Warm Springs allotment encompasses 356,666 acres, most of which is public land administered by the BLM. The allotment has been categorized as "I" (Improve the current unsatisfactory condition), as opposed to "M" (Maintain) or "C" (manage in a Custodial fashion) (BLM, 1988). An "I" designation may have the following characteristics:

- Ecologic conditions are poor to fair;
- Vegetation types have the capability of increased production;
- The range trend is declining or static;
- A high potential exists for positive economic return of public investments;
- The degree to which social/political controversy or interest conflict with present management is moderate to high;
- Resource management objectives are not being met (allotment is in need of an allotment management plan or grazing system, or major revisions are needed to an existing allotment management plan);
- Additional range improvements are required to meet management objectives;
- Land status, exchange-of-use agreement, and size are not prohibitive factors for future management practices if there is a history of prior trespass;
- It is feasible to implement more intensive grazing management and to further develop range improvements (as compared to other allotments considering constraints of 10-year projections of funding and manpower availability); and
- One or more major resource conflicts are present with critical wildlife habitat, wild horse and burro/livestock use areas, recreation, water rights, mining, lands action, reintroduction of plants and animals, soil, water, and air quality.

The Warm Springs allotment is currently leased by the Tumbling JR Ranch (owned by Barrick Gold U.S. Inc.) and is managed for an active grazing preference of 7,709 animal unit months, year-round, on BLM-administered lands. The Mooney Basin and BMM heap leach pads and process areas are the only portion of the Proposed Action area that are currently fenced or proposed to be fenced under the Proposed Action. No plans currently exist to fence the entire Proposed Action area. No range improvements are currently proposed for this allotment. Few



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-15
GRAZING ALLOTMENTS

natural surface water sources, including springs, are available for use by grazing livestock in the project vicinity (Section 3.9).

The four prominent vegetation community types that occur within the Proposed Action area are pinyon-juniper, big sagebrush, low sagebrush, and mountain brush. Table 3-15 displays the percentage of each vegetation community type within the Proposed Action area, associated soil types, and average annual forage production in pounds per acre per year. Section 3.6 describes the vegetation community types in detail.

TABLE 3-15 VEGETATION COMMUNITIES, SOIL CHARACTERISTICS AND AVERAGE ANNUAL FORAGE WITHIN THE PROPOSED ACTION AREA

VEGETATION COMMUNITY TYPE	PERCENTAGE OF PROPOSED ACTION AREA	ACREAGE WITHIN PROPOSED ACTION AREA	ASSOCIATED SOIL CHARACTERISTICS	AVERAGE ANNUAL FORAGE PRODUCTION (POUNDS PER ACRE)
Pinyon-juniper	45.5	7,482	shallow, loamy soils with high percentages of coarse fragments	440
Big sagebrush	48.2	7,941	alluvial fans, typically on soils derived from limestone	630
Low sagebrush	0.8	130	shallow, rocky soils along mountain ridges on gentle to very steep slopes	250
Mountain brush	5.5	912	steep side slopes and back slopes of hills and mountains at all aspects moist slopes with north and east aspects shallow to moderately deep, loamy soils	720

3.10.2 Range Resources Environmental Consequences

Proposed Action

Anticipated environmental impacts to livestock and grazing resources include the loss of forage due to ground disturbance and restricted access to active mining areas for security and safety reasons. The anticipated impacts are described below.

The primary impact on rangeland resources resulting from the Proposed Action would be a potential reduction in stocking rates because of access restrictions and disturbance to portions of the site and the loss of vegetation in disturbed areas. The Proposed Action would temporarily disturb and restrict access to 3,920 acres of rangeland (about 1 percent of the allotment), although the disturbance would not happen at the same time and reclamation would be implemented in stages. Assuming that 40 acres is needed to support one animal unit month, the maximum potential impact would be a temporary loss of 98 animal unit months, or less than 2 percent of the active grazing preference. This would temporarily reduce the active grazing preference. The actual stocking rate would also depend on other factors such as range condition. A permanent loss of 540 acres of rangeland would result from pit expansion associated with the Proposed Action and the construction of the berm along the pit perimeter after the mine closure and reclamation. The permanent loss would be less than 0.2 percent of the allotment area and would have a negligible effect on grazing.

Successful reclamation and increased forage productivity associated with the waste rock dumps may partially compensate for the permanent loss of forage, although this could be partially offset by establishment of non-native invasive species. At the end of reclamation, a re-evaluation of animal unit months would be completed during the term permit renewal process. This and other disturbances would be taken into account during this process to determine the appropriate number of animal unit months.

Alternative A – Partial Backfill Alternative
Impacts to grazing under this alternative would be essentially the same as with the Proposed Action. There would be a reduction of approximately 434 acres in the amount of disturbance resulting in a short-term loss of 87 animal unit months.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Impacts to grazing under this alternative would be essentially the same as with the Proposed Action. There would be a reduction of approximately 105 acres in the amount of disturbance resulting in a short-term loss of 95 animal unit months.

No Action Alternative
Under the No Action alternative, there would be no impacts to grazing other than those already authorized.

3.11 Wild Horses

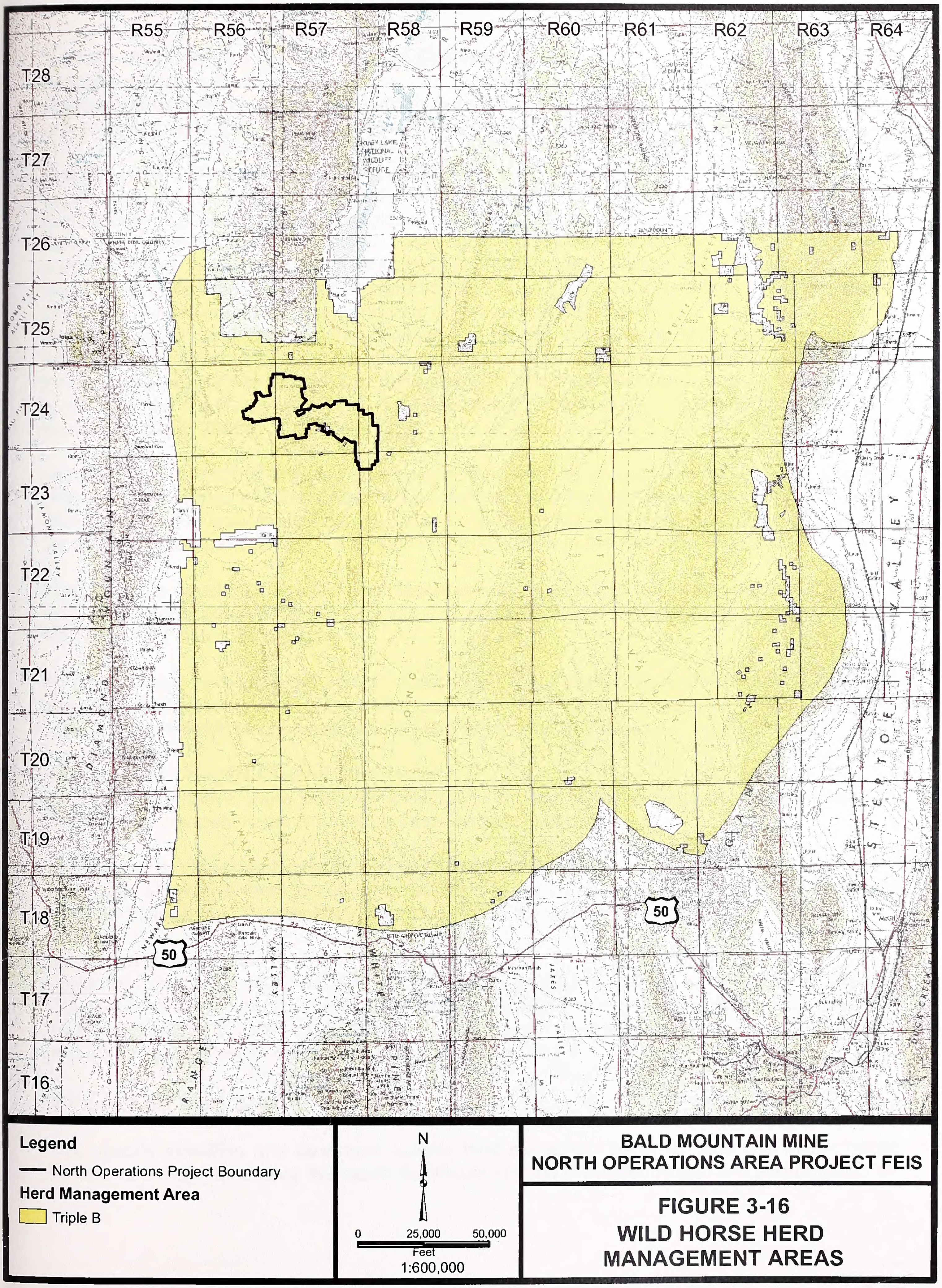
The following sections present information on wild horses and environmental consequences.

3.11.1 Wild Horses Affected Environment

Wild horses, protected under the Wild Free-Roaming Horse and Burro Act of 1971, occur within the Proposed Action area, which lies within the Triple B Herd Management Area, which is comprised of the previously defined Buck and Bald, and Butte Herd Management Areas, as shown on Figure 3-16. Wild horse populations generally summer in the Buck and Bald mountains, moving down into Newark, Long, and Huntington valleys during the winter period. Sufficient year-long range is available within the region, and wild horses are generally in good condition. However, competition exists among wild horses, livestock, and wildlife for forage and water resources.

According to the Ely Record of Decision and Approved Resource Management Plan (BLM, 2008d), the initial Appropriate Management Levels for the Triple B Herd Management Area are between 250 and 518 (BLM, 2007b). Prior to establishment of the Triple B Herd Management Area and in order to achieve Appropriate Management Levels, 1,045 wild horses were removed from the Buck and Bald Herd Management Area in 1997, 667 in 2001, 586 in 2005, and 210 in 2006. Wild horses removed from the herd management area were placed into the BLM's adoption program or a permanent holding facility.

As of the census in July 2008 there were 555 wild horses in the Triple B Herd Management Area (Thompson, 2009). The initial Appropriate Management Level for the Triple B Herd Management Area, as discussed in the Ely District Approved Resource Management Plan, is 250 to 518 horses (BLM, 2008d). This range is achieved by capturing enough horses during a gather to approach the lower end, and then allowing natural increase in the population until it approaches the high end. Wild horses are occasionally found in the vicinity of the Proposed Action, but usually avoid this area because of the activity (Thompson, 2009).



Legend

— North Operations Project Boundary

Herd Management Area

Triple B

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-16
WILD HORSE HERD MANAGEMENT AREAS

3.11.2 Wild Horses Environmental Consequences

Proposed Action

Potential environmental impacts to wild horses include reduction in forage, displacement by human disturbance, and collisions with vehicles, as described below.

Overall impacts to wild horses associated with the Triple B Herd Management Area are expected to be minimal. Approximately 540 acres of foraging or thermal cover area would be permanently lost as a result of expanded pits with 3,920 acres of foraging and thermal cover temporarily lost during active mining. The short-term effects from mine blasting, equipment operation, and increased human presence in the Proposed Action area would temporarily displace animals within the Triple B Herd Management Area. Vehicle-related mortalities within the entire herd management area and loss of forage from habitat removal would result in short-term impacts on wild horses. The locations of project components (e.g., haul roads) could intersect daily movement routes between foraging areas and seasonal migration corridors. Wild horses have adapted to the existing mining activity and thus are expected to adjust to similar activities under the Proposed Action. The anticipated habitat loss would last until reclamation is completed (BLM, 1995a).

Mining operations could displace wild horses into adjacent areas. The BLM's final allotment decisions and control of the number of wild horses in the herd area would maintain wild horse populations at the appropriate carrying capacity of the range. This would minimize the potential for direct conflicts between mine activities and wild horses in the Proposed Action area.

The BLM has developed specific Best Management Practices to minimize potential impacts to wild horses and other wildlife (Appendix D). These include road warning signs and timely reclamation of disturbed areas.

As vegetation is re-established, habitat quality and forage availability would improve, resulting in a beneficial effect to the horses over time on these areas. No additional adverse impacts to wild horses are anticipated from mine closure and reclamation activities.

Alternative A – Partial Backfill Alternative

Under this alternative, there would be a reduction of disturbance acreage by approximately 434 acres. No permanent impacts to wild horses are anticipated.

Alternative B – Mooney Basin Heap Leach Pad Alternative

Under this alternative there would be a reduction of disturbance acreage by approximately 105 acres of disturbance. Permanent impacts to wild horses are not anticipated.

No Action Alternative

Under this alternative, additional impacts to range resources would not occur from development and operation of the Proposed Action. Presently permitted mine and exploration projects for the BMM would result in disturbance of up to 4,165 acres of rangeland. No additional impacts to wild horses other than those already authorized would occur.

3.12 Land Use and Access

This section identifies and describes current land ownership patterns, land use plans, public access, and major land uses that could be affected by the Proposed Action and alternatives.

3.12.1 Land Use and Access Affected Environment

Access and land use information was compiled from U.S. Geological Survey 7.5-minute topographic quadrangles, Nevada Department of Transportation highway maps, BLM Master Title Plats, BLM Oil and Gas Plats, BLM Transportation Plan, White Pine County Land Use Plan, aerial photography, and the BLM's Ely Resource Management Plan.

Land use patterns in the Proposed Action area are typical of eastern Nevada and the Ely District Office jurisdiction and consist mainly of mining, ranching, wildlife habitat, hunting, and recreation. The private ranches in the immediate vicinity of the Proposed Action area were owned by Silver State Ranches until May 16, 2006, when they were purchased by Barrick Gold U.S. Inc. and are now leased to other operators under the new name of Tumbling JR Ranch.

Other land uses in the vicinity include Christmas tree harvesting, fuel wood cutting, and pinyon nut gathering, although the remote location and distance to nearby population centers significantly limits these activities. Pinyon-juniper fuel wood sales in the Ely District in 2004 totaled 1,581 cords, and 1,026 Christmas trees were harvested for individual and commercial use (BLM, 2007b). Harvesting of pinyon nuts on BLM land is permitted for both personal and commercial use. Up to 25 pounds of pinyon nuts may be collected from District land for personal use without a permit; commercial collection permits are sold at auction for designated areas only (BLM, 2007b). Pinyon nuts were an important resource for Native Americans, and pinyon nut collecting remains part of their tradition and the focus of tribal ceremonies.

A discussion of existing conditions and potential project impacts on specific land uses such as grazing, vegetation, wildlife, and recreation are discussed in more detail in their respective sections of this document.

Land Jurisdiction/Ownership
White Pine County

The Proposed Action area is located in the northwest corner of White Pine County. The County encompasses approximately 5.7 million acres, over 90 percent of which is federal land administered by the BLM, U.S. Forest Service (USFS), National Park Service, U.S. Fish and Wildlife Service, and other agencies. Tribal lands comprise 1.2 percent, and State government administers 0.2 percent of the County's land (White Pine County, 2006).

In the White Pine County Land Use Plan (1998a), the County presents specific land use plans for the communities of Ely, Baker, Lund, McGill, Preston, and Ruth. The balance of the County is treated collectively and in more general terms. White Pine County has 11 general land use designations in the plan: Open Range; Low-, Medium-, and High-Density Residential; Mobile Home; Commercial; Industrial; Public Facility/Recreation; Public Land Transfer; Brownfield; and Federal Reserve. Most land outside of established communities, including the Proposed Action area, is designated in the county land use plan as Open Range or Federal Reserve. Land designated as Open Range is used mainly for ranching but also for mining, for recreation, and as wildlife habitat.

The County also prepared the White Pine County Public Land Use Plan (White Pine County, 1998b), which is Appendix 1 in the White Pine County Land Use Plan (White Pine County, 1998a). The purpose of the Public Land Use Plan is to coordinate County planning on public lands with federal land management agencies. The Public Land Use Plan applies to public lands designated as Open Range and Federal Reserve in the White Pine County Land Use Plan. This plan specifically encourages mineral exploration and development on public lands, consistent with sound economic and environmental practices. The plan also supports transportation of mineral and mining products and material essential to the mining operation on public roads and highways.

Bureau of Land Management

Except for approximately 73 acres of private land owned by Barrick, the Proposed Action area is on public land administered by the BLM. The Proposed Action area is located in the Egan Field Office jurisdiction and is managed according to the Ely District Resource Management Plan (BLM, 2007b). The Ely District Resource Management Plan provides guidance for management of 3.8 million acres of public land in east-central Nevada. Most of the Egan Field Office jurisdiction is in White Pine County, with the remainder in Nye County. BLM Resource Management Plans are long-range, comprehensive land use plans, which identify planning objectives and policies for designated areas and provide for multiple land uses. The planning objectives are implemented through activity plans for specific uses such as grazing allotments, wildlife habitat, and wild horses.

The BLM grants land use authorizations to private entities and other government agencies to use BLM land for specific purposes. A review of BLM documents identified the land use authorizations shown in Table 3-16. There are no designated or planning utility corridors or land disposal areas within the Proposed Action area. The status of mining claims in the Proposed Action area is contained in the BMM North Operations Area Project Plan of Operations (BMM, 2009). The BLM Land and Mineral Records System (LR2000) was used to access land and mineral records.

Access

The major highway closest to the Proposed Action area is U.S. Highway 50, approximately 35 miles to the south. State Route 892 is paved from U.S. Highway 50 north to the BMM mine turnoff, a distance of about 35 miles. This is the main access road for the mine and the designated route for deliveries of most equipment and materials. The town of Elko and Interstate Highway 80 are approximately 70 miles north of the BMM. Access from Elko to the mine is only partially paved. A third access route is from U.S. Highway 50 north on Long Valley Road, which continues past the mine to the Ruby Lake National Wildlife Refuge and Ruby Valley. Long Valley Road is paved only for about 25 miles north of U.S. Highway 50. The Long Valley Road access route is used only for deliveries of equipment and materials to the Mooney Basin area.

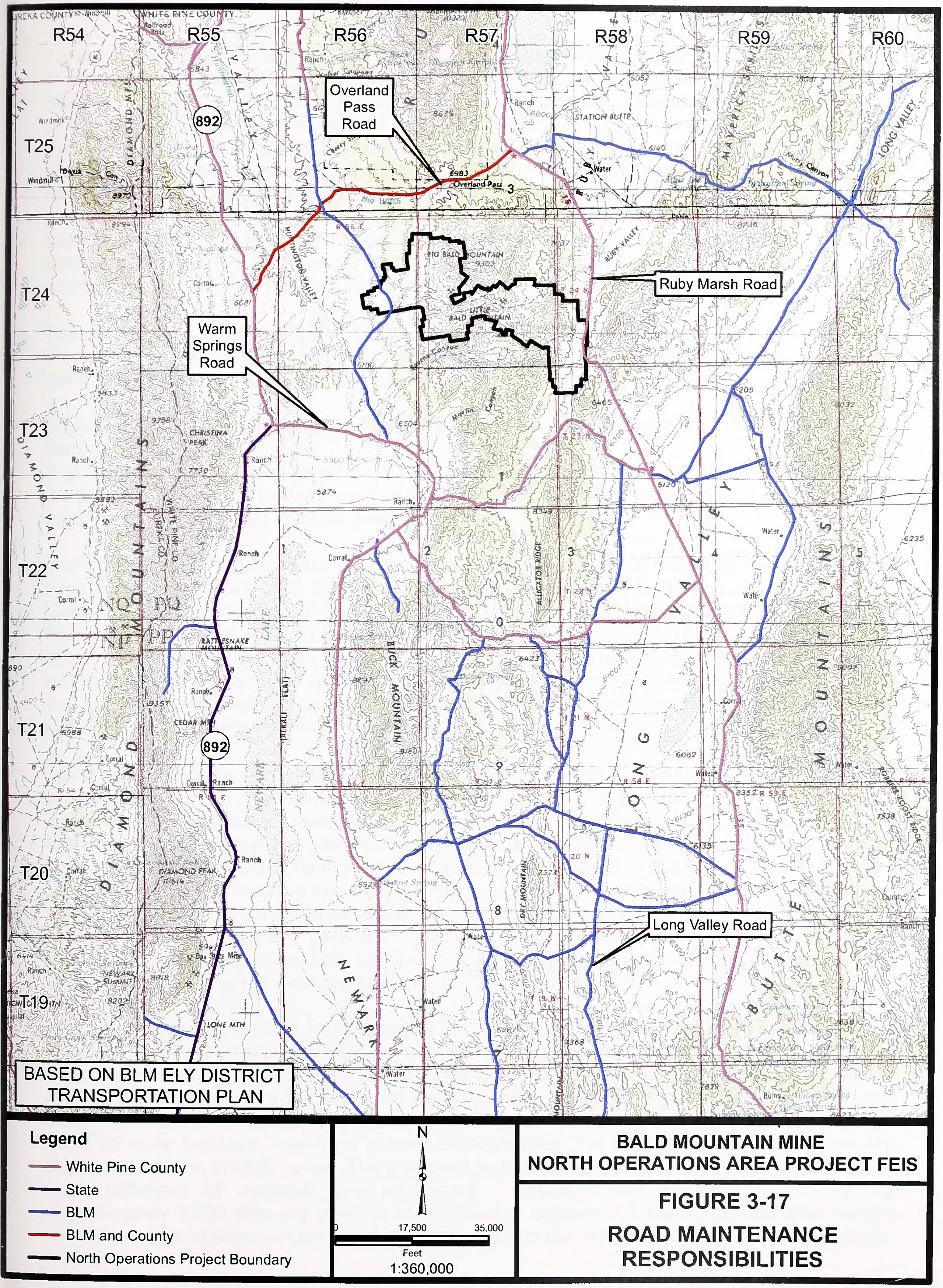
The mine's employees live in one of three general areas (Elko, Ely, and Eureka) and are transported to and from the mine in company-operated buses or vans. Personal vehicle travel to the site is discouraged and, because of the cost, employees rarely use personal vehicles unless they miss the bus or van.

The larger unpaved roads, including Long Valley Road, the road on the east side of Newark Valley, and the unpaved portion of the road to Elko, are maintained by White Pine or Elko counties. The remainder of the unpaved roads in the vicinity are maintained by the BLM. Road maintenance responsibilities are shown on Figure 3-17. Because of White Pine County's recent financial difficulties, road maintenance funding has remained at the 2003 level and the maintenance work force is currently being reduced through attrition. No tax revenue increases that would change this situation are likely in the near future (Sprouse, 2007).

TABLE 3-16 ADMINISTRATIVE LAND USE AUTHORIZATIONS IN THE VICINITY OF THE PROPOSED ACTION AREA

SERIAL NUMBER	DESCRIPTION/HOLDER
Township 23 North, Range 57 East	
NVN 078822	Mooney Basin Mine/Barrick Gold US (Proposed Action)
NVN 078825	Bald Mountain Exploration/Barrick Gold US
Township 23 North, Range 58 East	
NVN 057896	Power 25-foot Right-of-Way Placer Dome
NVN 078822	Mooney Basin Mine/Barrick Gold US (Proposed Action)
NVN 078825	Bald Mountain Exploration/Barrick Gold US
NVN 080865	Oil and Gas Lease/Plains Exploration and Production Co.
SS9	State Selection 1880 Sec 5, Lot 1
Township 24 North, Range 56 East	
NVN 053638	Road Federal Facility 40-foot Right-of-Way/BLM
NVN 057896	Power 25-foot Right-of-Way/Placer Dome
NVN 068193	Bald Mountain Mine/Barrick Gold US (Proposed Action)
0402	Range Improvement, Fence
0477	Land Treatment
0525	Range Improvement, Fence
0873	Land Treatment
0402	Range Improvement, Fence
0985	Range Improvement, Fence
4127	Range Improvement, Cattle Guard
4760	Range Improvement, Troughs and Pipeline
Township 24 North, Range 57 East	
MS 37	Mineral Survey
MS 38 A/B	Mineral Survey
MS 39	Mineral Survey
MS 3860	Mineral Survey
MS 5122	Mineral Survey
N43674	Water Storage Facility and Pipeline
NVN 053638	Road Federal Facility 40-foot Right-of-Way/BLM
NVN 062793	Communication Site Right-of-Way Federal Fac/BLM
NVN 062794	Communication Site Right-of-Way Federal Land Policy Management Act/BLM
NVN 068193	Bald Mountain Mine/Barrick Gold US (Proposed Action)
NVN 068282	Little Bald Mountain Mine/Barrick Gold US
NVN 068521	Winrock/Casino Mine/Barrick Gold US
NVN 078822	Mooney Basin Mine/Barrick Gold US (Proposed Action)
NVN 078825	Bald Mountain Exploration/Barrick Gold US
NVN 080044	Other Right-of-Way Federal Land Policy Management Act/Unavco Inc.
NVNVAA 000724	Mineral Patent/Lamoureux, Olmsted
NVNVAA 000725	Mineral Patent/Lamoureux, Olmsted
NVNVAA 000726	Mineral Patent/Lamoureux, Olmsted
NVCC 0005437	Mineral Patent/Ely-Nevada Exploration Co.
0043	Range Improvement, Fence
4607	Range Improvement, Fence
4608	Range Improvement, Fence
Township 24 North, Range 58 East	
NVN 057896	Power 25-foot Right-of-Way/Placer Dome
NVN 076694	Oil and Gas Lease/Connelly, M.S.
NVN 078822	Surface Management Plan/Placer Dome
NVN 079680	Oil and Gas Lease/Fasken Nevada
0491	Range Improvement, Windmill
1052	Range Improvement, Improved Spring
4460	Range Improvement, Fence

Source: BLM Master Title Plats from LR2000.



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-17
ROAD MAINTENANCE RESPONSIBILITIES

To assist local counties and to help provide road maintenance to meet the needs of BMM for maintained access, Barrick has been grading some of the main unpaved access roads at its own expense and recently hired a private contractor to maintain approximately 40 miles of road (a mix of both BLM and county roads) between Jiggs, Nevada, and the mine. Some additional work is done on unpaved portions of the Long Valley Road, which is used for deliveries to the Mooney Basin area. Barrick's road work has helped White Pine County conserve maintenance funds, but there have been some problems with the road base being scraped off. The base must then be moved back on the road by County crews (Sprouse, 2007). In the winter there have been problems with trucks (mainly with double loads) getting stuck, digging ruts in the road surface, and requiring assistance from the County. When this happens the County must divert workers from higher priority roads (Sprouse, 2007).

The County is currently experimenting with a surface treatment for unpaved roads that is supposed to repel water and reduce maintenance costs. If the experiment is successful, the treatment might be used on roads in the mine vicinity (Sprouse, 2007).

3.12.2 Land Use and Access Environmental Consequences

Proposed Action

Anticipated environmental impacts to land use and access include potential conflicts with existing land use authorizations, restricted access, and increased traffic on roads in the vicinity. Each of these anticipated impacts is described below.

Under the Proposed Action, the BLM would authorize expansion of the BMM North Operations Area Project operations area by 3,920 acres. There are existing BLM land use authorizations (Table 3-16) in the operations area such as rights-of-way for power transmission lines, roads, communications sites, oil and gas leases, and water facilities. Any potential conflict with an existing land use authorization would be resolved by consultation with the holder of the land use authorization. Resolving the conflicts might include actions such as re-locating existing utilities and obtaining any required permits from the BLM for permission to cross the authorization. Obtaining other necessary permits from state and county authorities might also be required.

The Proposed Action would result in active mining areas being restricted from public access for the life of the mine to protect mine property and for the safety of the public. Approximately 3,738 acres would be temporarily restricted during active mining and reclamation, and approximately 540 acres would be permanently lost as a result of expanded pits. Discussions of potential project impacts on specific land uses such as grazing, vegetation, wildlife, and recreation are found in other sections of this document. Pinyon-juniper woodlands within the Proposed Action area would continue to be unavailable for cutting fuel wood and Christmas trees or for harvesting pinyon nuts. The potential impact is expected to be minimal because existing land use within the areas proposed for expansion is light and vast amounts of pinyon-juniper forest closer to populated areas would remain.

Because the mine provides transportation for its employees, the effect of the transportation components of the Proposed Action on access roads would be minimal. Under the Proposed Action, the additional employees could be transported by using larger vehicles or by increasing the number of vehicles for the extended life of the mine; however, it is anticipated that one bus would be added to the fleet of two buses currently used. The new bus would likely be added to the Elko route because, based on current demographics, the majority of new employees are expected to live in the Elko area. The proposed increase in mine production would also result in more deliveries of materials and equipment. Deliveries are expected to increase to approximately 1,500 trips per year, or an increase of between 10 and 15 percent over current deliveries. This change would have a minimal effect on the condition of state and county roads.

Barrick proposes to continue its program of maintenance of unpaved access roads for the life of the mine.

Alternative A – Partial Backfill Alternative
Effects on land use and access under this alternative would be the same as the Proposed Action, except for fewer acres permanently lost.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Effects on land use and access under this alternative would be the same as the Proposed Action.

No Action Alternative
Under this alternative, mine operation would continue under the existing plan until gold production ceases in 2009. There would be no change in existing impacts to land use and access until mine closure and reclamation. At that time, land that was previously closed to all uses other than mining would be opened, and impacts to access roads from mine activity would end, in accordance with existing authorizations. In addition, Barrick would cease voluntary maintenance activities on unpaved portions of public access roads leading to the site.

3.13 Recreation

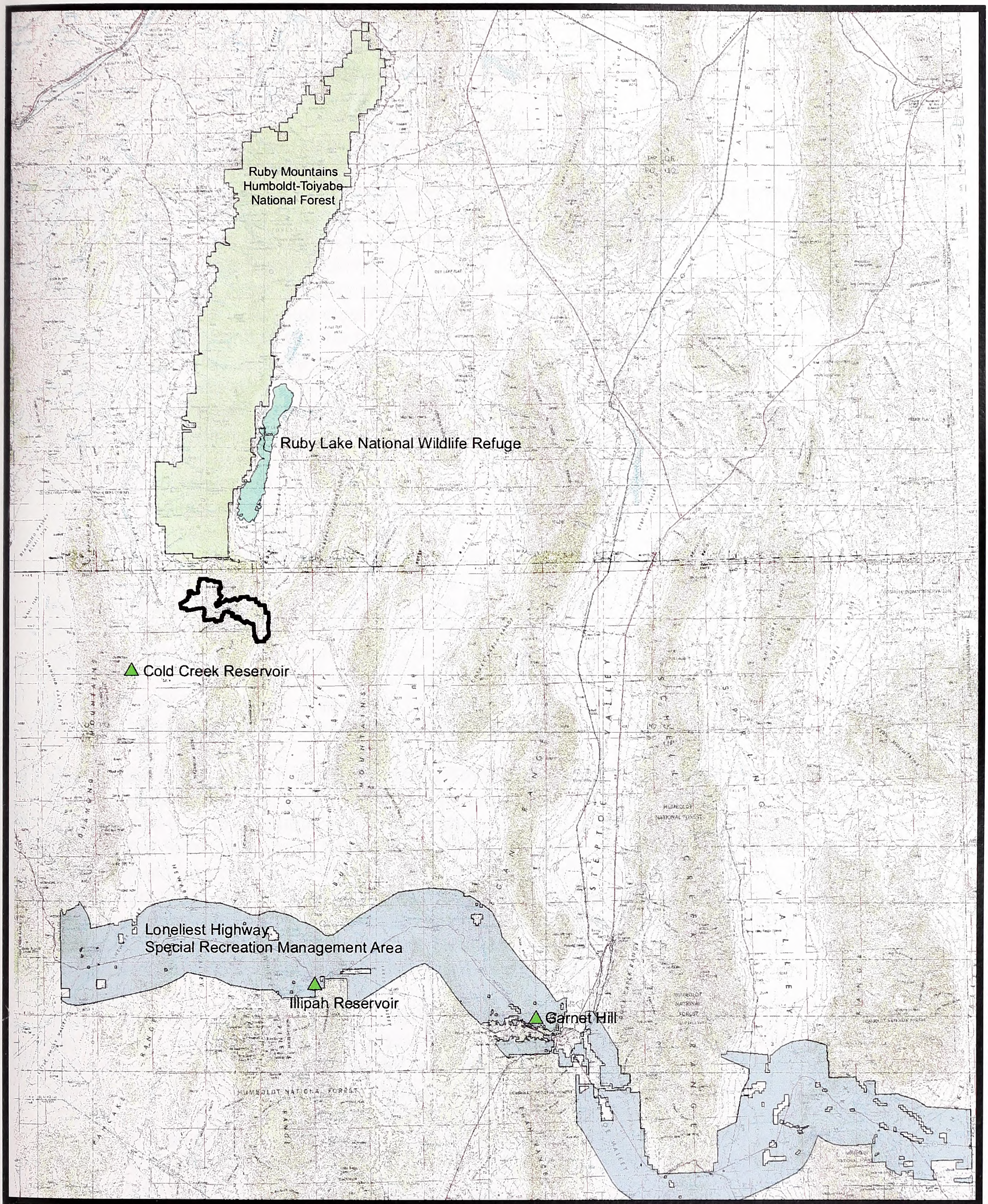
3.13.1 Recreation Affected Environment

For the fiscal year ending September 30, 2007, there was an estimated 297,895 visitor days to public land on the BLM Ely District (BLM, 2007b). Most recreational activities consist of dispersed uses such as off-highway vehicle use, hunting, fishing, camping, cross-country skiing, horseback riding, caving, rock climbing, and mountain biking (BLM, 2007b). Recreational usage of public lands in the BLM Ely District has been increasing, partly because of population growth in both the District and in Las Vegas. As opportunities for primitive recreation become scarce in other areas, more visitors are drawn to public land in the BLM Ely District.

Recreation in the BLM Ely District is managed by designation of Special Recreation Management Areas and Extensive Recreation Management Areas (BLM, 2007b). A Special Recreation Management Area is an area where more intensive recreation management is needed and where recreation is a principal management objective. An Extensive Recreation Management Area includes all BLM-administered lands outside the special recreation management areas and may include developed and primitive recreation sites with minimal facilities.

The Loneliest Highway Special Recreation Management Area was designated April 1, 1988 and was amended in the 2008 Ely District Approved Resources Management Plan. It encompasses the U.S. Highway 50 corridor (Figure 3-18). The Loneliest Highway Special Recreation Management Area encompasses 675,120 acres. BLM management objectives for this Special Recreation Management Area are to provide recreational opportunities to the public that would otherwise not be available, reduce conflict among users, minimize damage to resources, and reduce visitor health and safety issues. The remainder of the BLM Ely District is divided into the Schell, Egan, and Caliente Extensive Recreation Management Areas and other Special Recreation Management Areas outside of the project area (BLM, 2008d).

Executive Order 13443 Facilitation of Hunting Heritage and Wildlife Conservation was signed on August 16, 2007. The order directs federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management to evaluate the effect of their actions on trends in hunting participation and to



Legend

- North Operations Project Boundary
- Recreation Areas
- Ruby Mountains H-T National Forest
- Special Recreation Management Area
- Ruby Lake National Wildlife Refuge

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FIGURE 3-18
RECREATION AREAS

facilitate the expansion and enhancement of hunting opportunities and management of game species and their habitat.

Hunting, primarily for mule deer, fishing, and off-highway vehicle use are the main recreational activities in the vicinity of the Proposed Action. Hunting within the active mine area itself is prohibited by Mine Safety Health Administration regulations. The Proposed Action area is located within NDOW's Hunting Area 10, which totals approximately 6,000 square miles and comprises Units 101 through 108. Unit 108 encompasses approximately 900 square miles and includes land in the Ruby Mountains south of Overland Pass and north of U.S. Highway 50 (NDOW, 2007a). Area 10 generally includes land between Interstate Highway 80 and U.S. Highway 50 east of Elko and west of Ely. NDOW (2007b) reports that the mule deer population in Area 10 is up slightly from the previous year and has increased in six of the last seven years. Area 10 is reported to have been less adversely affected by drought than other hunting areas. A total of 916 mule deer were harvested in Area 10 during the 2006-2007 season by residents and 171 by non-residents (NDOW, 2007c). The level of deer-hunting activity in surrounding areas of the Proposed Action area is considered moderate by NDOW (Wasley, 2007b).

In addition to mule deer–hunting, there is some level of activity by trappers and upland game hunters in the vicinity of the Proposed Action area (Wasley, 2007b).

There are no fisheries in the immediate vicinity of the Proposed Action area. The most popular fishing area in the general vicinity is Ruby Lake, a natural, spring-fed, high elevation marsh located entirely on the Ruby Lake National Wildlife Refuge. The Ruby Lake National Wildlife Refuge is about seven miles northeast of the BMM North Operations Area Project boundary and contains over 9,000 acres of lakes, ponds, and waterways at an elevation of approximately 6,000 feet. A campground operated by the USFS is adjacent to Ruby Lake, and there are several primitive camping sites along the west side foothills (NDOW, 2007d). The Ruby Lake National Wildlife Refuge is popular for wildlife viewing as well as fishing.

Cold Creek Reservoir is located approximately 15 miles southwest of the Proposed Action area. The reservoir is a small, spring-fed fishery that was constructed in 1943 for irrigation purposes and is located on both public and private land. The complex consists of a main spring with an outflow that feeds two lower ponds (only the lower pond presently contains water). The lower pond is considered to be the actual Cold Creek Reservoir and covers a total of 14 surface acres with a maximum depth of 24 feet. Along with a wild, spawning population of rainbow trout, hatchery rainbow trout are stocked annually to augment the population. A primitive boat ramp is available on the main pond, but no other facilities are available. Because of its remote location, Cold Creek Reservoir receives little fishing pressure (NDOW, 2007d).

Illipah Reservoir is located approximately 40 miles south of the Proposed Action area near U.S. Highway 50. The reservoir was first created in 1953 when Illipah Creek was impounded for irrigation purposes. In an agreement with the landowner that guaranteed a minimum pool, NDOW paid for construction of a new dam and the reservoir was enlarged in 1981 (NDOW, 2007d). Although located almost entirely on private land, the adjacent land is managed as a recreational area by the BLM under a cooperative agreement with NDOW. At capacity, Illipah covers 70 surface acres to a maximum depth of 50 feet. The BLM maintains a campground, and an undeveloped boat launch is available.

Additional recreation opportunities are found in the Ruby Mountains Ranger District of the Humboldt-Toiyabe National Forest. The District is made up of the East Humboldt and Ruby Mountain ranges and covers about 450,000 acres, including the East Humboldt Wilderness Area, with elevations ranging from 6,000 feet to 11,387 feet at Ruby Dome. Hiking, horseback riding, cross-country skiing, photography, camping, hunting, and fishing are available within the USFS wilderness area with snowmobiling, mountain biking, and four-wheeling available outside the wilderness area.

The 1,280-acre Garnet Hill Rockhounding Area, known for the abundance of gemstone quality ruby red garnets found in the volcanic rock, is located approximately 50 miles southeast of the Proposed Action area.

Only a limited amount of data for recreational activity in the vicinity of the Proposed Action area were available for analysis. Recreation usage compiled by the BLM (2007c) for the fiscal year ending September 30, 2007, shows 41,356 total visitor days for the Loneliest Highway Special Recreation Management Area; 2,343 visitor days for Cold Creek Reservoir; 2,912 visitor days for the Garnet Hill Rockhounding Area; and 35,387 visitor days for Illipah Reservoir.

3.13.2 Recreation Environmental Consequences

Proposed Action

Anticipated environmental impacts to recreation result mainly from restricted access. Under the Proposed Action, the Plan of Operations boundary would expand from 12,727 acres to 16,465 acres. This would restrict public access for hunting and other recreation from active mining areas for the duration of mine operation and reclamation. The displacement of dispersed recreational users from this area is expected to have a minimal adverse impact because recreational use of public lands in the Proposed Action area is relatively light and an abundant amount of open public land remains in the BLM Ely District Office area. The Pony Express Trail would remain open for off road touring, and the Long Valley Road would remain open for access to Ruby Lake National Wildlife Refuge. No impacts to recreation are anticipated at Cold Creek Reservoir, Illipah Reservoir, Ruby Lake National Wildlife Refuge, Garnet Hill Rockhounding Area, or Humboldt-Toiyabe National Forest. Potential indirect effects to recreational users from visual impacts are discussed in Section 3.15, Visual Resources.

As discussed in Section 3.8, potential indirect effects to hunting and trapping from the project on game species populations are anticipated to be minimal. The Proposed Action would comply with Executive Order 13443 Facilitation of Hunting Heritage and Wildlife Conservation because potential effects to hunting have been evaluated and hunting access has been facilitated to the extent possible.

Alternative A – Partial Backfill Alternative

Recreation effects under this alternative would be the same as with the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative

Recreation effects under this alternative would be the same as with the Proposed Action.

No Action Alternative

Under this alternative, gold mining activities would continue under the current authorizations for the BMM and Mooney Basin Operations Area. There would be no change in existing road closures or the amount of land closed to recreation until mine operation and reclamation is completed. At that time, the 12,727 acres of public land currently closed to recreation would be opened, in accordance with existing authorizations.

3.14 Air Quality

Assumptions for Analysis

Assumptions made for the air quality analysis include the following:

- Quantitative air quality modeling assumed that all pollutants were emitted at maximum operational capacity consistent with the operational scenario modeled;

- For all pollutant impact analyses other than ozone, all pollutants emitted were assumed to remain in their emitted state without physical or chemical transformation during atmospheric transport, consistent with U.S. Environmental Protection Agency and Nevada Division of Environmental Protection guidance; and

- Regional data are assumed to be representative of conditions within the direct impact analysis area.

3.14.1 Air Quality Affected Environment

Area of Analysis

The air quality direct impact analysis area includes a broad zone around the current and proposed mine sites west of Long Valley. The direct impact analysis area is defined by a 12-mile radius around the proposed mine site. That area includes all predicted maximum impact areas and most of the areas where air quality modeling showed a significant contribution (as defined quantitatively by U.S. Environmental Protection Agency Significant Contribution Levels for Class II airsheds) to ambient air quality. The analysis area also includes a 200-yard-wide corridor centered along the primary access roads to the mine for 12 miles beyond the mine boundary.

Climate

The existing and proposed mine is at a high elevation on and around Bald Mountain. Terrain on the west side of Bald Mountain is channeled by the Bald Mountain ridge primarily from south to north. Wind speeds are moderate during most daylight hours after mid-morning and generally lighter during the evening hours. Atop the ridge, the wind patterns are understood to have a stronger component of west to east flow. Winds are also affected by terrain channeling, primarily along valleys and drainages where winds are directed in a north and south direction down valleys during evening hours. On the east side of the ridge, winds are channeled north and south, with terrain blocking significant transport to the west. The Nevada Division of Environmental Protection recommended the use of Elko meteorological data for air quality impact modeling associated with the facility's air permit applications. The Elko area features similar wind patterns forced by the valleys in this Basin and Range country, trending south to north. The Elko windrose chart (Figure 3-19) shows predominant and strongest winds are from the west and southwest, with moderate frequency and wind speeds from the east and northeast.

The analysis area includes a four-season environment with cold winters in the Proposed Action area. The valley locations feature warmer mean temperatures than the high elevation activity areas, but they are still above 5,000 feet in elevation and have temperatures below freezing in the fall and spring and have cold winters. Due to the high elevation of the mine, all emissions are above the inversions that form on the valley floor. Precipitation amounts are less in the valleys and more in the surrounding highlands. Table 3-17 summarizes meteorological conditions in the vicinity of the Proposed Action.

TABLE 3-17 METEOROLOGICAL CONDITIONS IN THE PROPOSED ACTION VICINITY

MONITOR	ELEV. (FEET)	WINTER AVERAGE	SPRING AVERAGE	SUMMER AVERAGE	FALL AVERAGE	ANNUAL AVERAGE
Mean Seasonal Temperature Average (degrees Fahrenheit)[1]						
Eureka	6,540	31.5	51.4	65.3	37.5	46.4
Diamond Valley (USDA)	5,910	29.8	51.3	62.6	34.9	44.7
Diamond Valley Pollard	5,840	28.2	48.6	63.1	33.5	43.4

MONITOR	ELEV. (FEET)	WINTER AVERAGE	SPRING AVERAGE	SUMMER AVERAGE	FALL AVERAGE	ANNUAL AVERAGE
Cortez Gold Mine	4,910	35.6	56.1	69.8	39.4	50.2
Pine Valley Bailey Ranch	5,050	31.1	51.4	61.8	34.4	44.7
Jiggs	5,760	29.7	50.4	62.5	35.2	44.7
Mean Seasonal Precipitation Average (inches)[1]						
Eureka	6,540	3.3	3.5	2.3	2.7	11.8
Diamond Valley (USDA)	5,910	2.4	2.8	2.0	2.1	9.3
Diamond Valley Pollard	5,840	1.5	3.6	1.9	2.0	9.1
Cortez Gold Mine	4,910	2.5	3.0	1.9	2.3	9.7
Pine Valley Bailey Ranch	5,050	2.4	3.5	1.7	2.7	10.7
Jiggs	5,760	3.9	4.6	2.0	3.4	13.9
Mean Seasonal Snowfall/Snow Cover (inches)[1]						
Eureka	6,540	19.5 / 1.0	7.1 / 0	0.4 / 0	13.6 / 0.3	40.7 / 0.3
Diamond Valley (USDA)	5,910	0.8 / 0	0.2 / 0	0 / 0	0.2 / 0	1.3 / 0
Diamond Valley Pollard	5,840	11.6 / 0.7	0 / 0	0 / 0	8.5 / 0.3	20.1 / 0.3
Cortez Gold Mine	4,910	9.2 / 0	3.4 / 0	0 / 0	5.7 / 0	18.2 / 0
Pine Valley Bailey Ranch	5,050	10.5 / 1.0	0.1 / 0	0 / 0	8.2 / 0.3	18.7 / 0.3
Jiggs	5,760	24.5 / 0	7.5 / 0	0 / 0	11.5 / 0	43.4 / 0

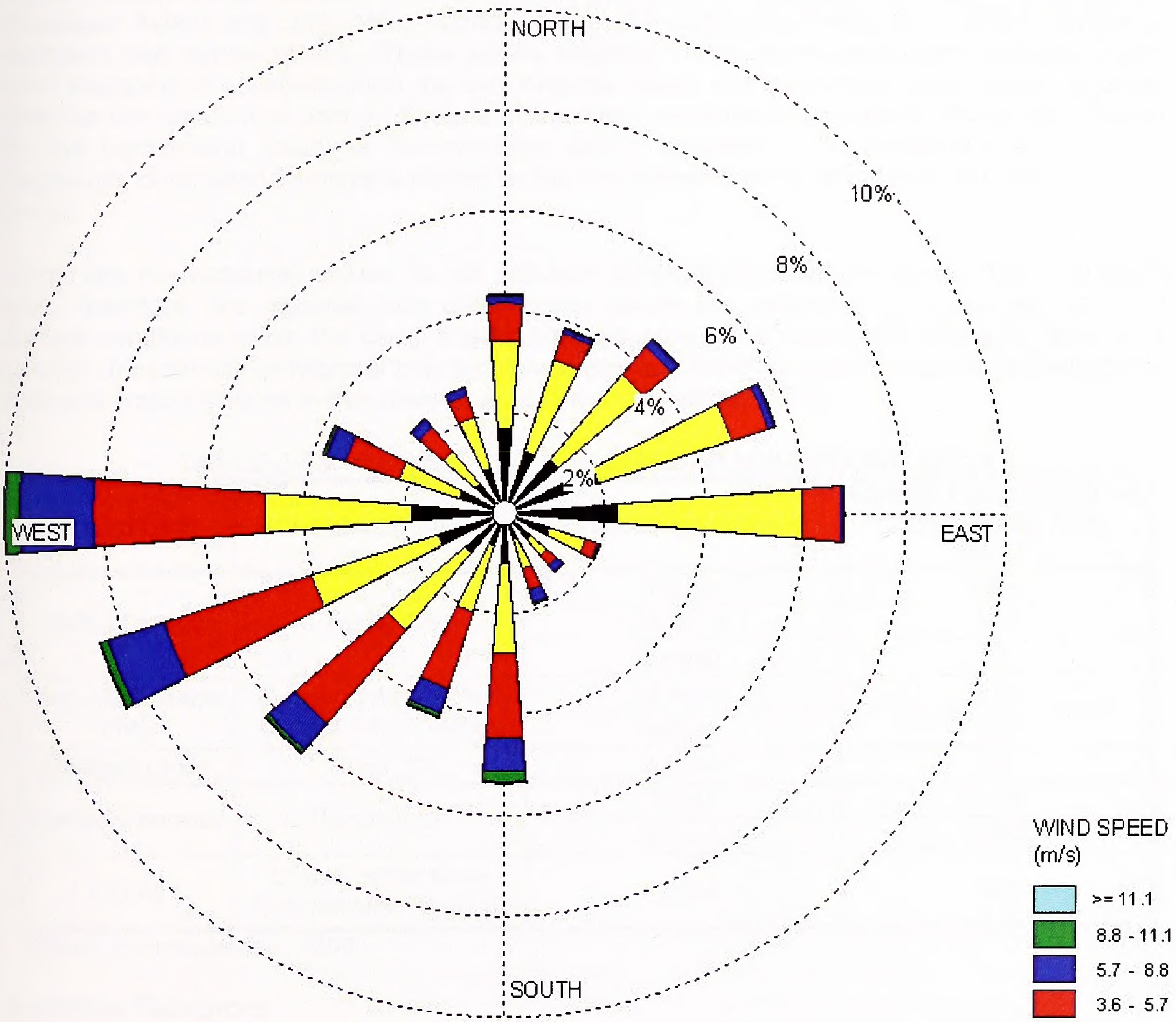
Source: WRCC, 2006.

[1] For mean monthly temperature, mean monthly precipitation, and mean monthly snowfall, the period used is from inception (1982 or earlier) – 2006, except for the Cortez Gold Mine, for which data are from 1968 - 1977.

Regional Air Quality

The entire direct impact analysis area and immediately surrounding areas are currently in attainment or unclassified (these terms are defined below) for all criteria air pollutants. Monitoring of criteria pollutants in east-central Nevada has been limited since the late 1990s. The Nevada Division of Environmental Protection discontinued historic particulate matter (PM_{10}) monitoring when the U.S. Environmental Protection Agency allowed monitoring to cease where monitoring showed pollutant trends at less than 60 percent of the National Ambient Air Quality Standards. PM_{10} monitoring was conducted in McGill from 1993 to 1998, and ongoing PM_{10} monitoring is conducted in Elko, in Battle Mountain, in Baker, and at Great Basin National Park. Those historic monitoring efforts indicate low particulate levels in rural portions of the region, with levels slightly elevated but well below State or U.S. Environmental Protection Agency air quality standards in the developed areas.

Most air pollutant monitoring is undertaken in locations with relatively high population density where high pollutant levels might be expected. Almost all of the monitoring conducted by the State of Nevada is done in the Reno/Carson City or Las Vegas areas. Monitoring data from throughout the United States are available at the U.S. Environmental Protection Agency Air Data web site (http://www.epa.gov/air/data/index.html). Monitoring data from most of the western States were reviewed for the air impact modeling conducted for the Proposed Action (Enviroscientists, 2008). Not all monitoring sites monitor all of the criteria pollutants. Table 3-18 lists the pollutant, timeframe, monitor location, and assumed background value based on the first-high value from the years reviewed (Enviroscientists, 2008). The first-high value from the monitoring data was used rather than the second-high value because the State of Nevada uses the more stringent first-high value to determine compliance with State ambient standards (see Table 3-18).



NOTE: DATA FROM ELKO AIRPORT NWS ELKO, NV
6.1-METER LEVEL WINDROSE, 1986-1990

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-19
WINDROSE CHART

Trona, California, was chosen for background values for sulfur dioxide and nitrogen oxide. Trona is a small desert town in southern California. The monitoring at Trona does not include carbon monoxide. Barstow, California, was chosen for carbon monoxide, although this southern California town is located at the junction of two interstate highways and is a major railroad center. Monitored combustion emissions would be expected to be higher in Barstow than in the Proposed Action and cumulative effects areas. All ozone monitoring in southern California indicated high ozone values. These values probably reflect local combustion sources, down-wind transport of pollutants from the Los Angeles basin, and persistent warm, sunny weather ideal for the creation of ozone. Craters of the Moon National Monument in Idaho was chosen for the background value for the one-hour ozone standard. The Monument is a remote, sagebrush-dominated landscape similar to the Proposed Action's direct and cumulative effects areas.

There are no measured values for air pollutant concentrations for the direct impact analysis area; therefore, the regional data documented above are assumed to be representative of current conditions within the direct impact analysis area. The measured values in Table 3-18 provide the estimate of regional pollutant levels and are therefore used to represent background pollutant concentrations in the analysis area (Enviroscientists, 2008).

TABLE 3-18 REGIONALLY MEASURED BACKGROUND DATA

POLLUTANT	MONITOR LOCATION	AVERAGING PERIOD	AMBIENT BACKGROUND CONCENTRATION (MG/M^3)
Sulfur Dioxide	Trona, CA	3 hours	28.6
		24 hours	18.3
		Annual	9.0
Particulate Matter PM_{10}	Bureau of Air Pollution Control default values	24 hours	10.2
		Annual	9.0
Nitrogen Oxide	Trona, CA	Annual	9.4
Carbon Monoxide	Barstow, CA	1 hour	3,771
		8 hours	1,666
Ozone	Craters of the Moon National Monument, ID	1 hour	141

Source: Enviroscientists, 2008.

Sensitive Receptors

Properties or areas were considered sensitive receptors if impacts to those sites could affect existing (or formally and definitive planned) populations or ecological areas especially sensitive to those impacts. The Ruby Lake National Wildlife Refuge is located to the north of the BMM North Operations Area Project. Because of the sensitivity of the ecosystem and local activities, the State fish hatchery on the west side of the Refuge was identified as the closest sensitive receptor. That National Wildlife Refuge and the wilderness area in the mountains to the west are the nearest special designation Class II areas. The fish hatchery at the Refuge was chosen as the worst-case sensitive receptor because the prevailing west and southwest winds in the model made the hatchery the nearest downwind sensitive area. The Jarbidge Wilderness, 130 miles to the north near the Idaho border, the nearest Class I airshed, was also considered a sensitive receptor.

Existing Emission Sources

Land use in the direct impact analysis area is dominated by mining, ranching, and recreation. The BMM is currently operating as a Class II source with emissions below the Prevention of

Significant Deterioration major source threshold, so existing mining activity is included as part of the affected environment. Other currently operating projects are identified in the cumulative effects analysis.

Effects on Air Quality from Existing Emission Sources

Current activity levels include emissions from two oil and gas wells, the USFS Fuel Management Program, and the active BMM. There are no sensitive receptors in the immediate vicinity of the BMM North Operations Area Project. The nearest residence or areas of human activity are ranches in the valleys below the Proposed Action area and at least five miles distant from the mine boundary. The high-elevation mine site is mostly above surrounding topography, limiting the potential for concentration of pollutants by terrain but potentially allowing for transport by wind.

Existing Emission Sources Other Than Bald Mountain

Other emission sources are identified in the cumulative impacts section. Their impacts are accounted for in the background concentrations used in the quantitative modeling analyses (Appendix H).

Regulatory Framework

Federal Clean Air Act

The Federal Clean Air Act and the subsequent Federal Clean Air Act Amendments of 1990 require the U.S. Environmental Protection Agency to identify National Ambient Air Quality Standards to protect public health and welfare. The Federal Clean Air Act and the Federal Clean Air Act Amendments of 1990 established National Ambient Air Quality Standards for seven pollutants, known as "criteria" pollutants, because the ambient standards set for these pollutants satisfy "criteria" specified in the Federal Clean Air Act. These ambient air quality standards are quantitatively set for criteria air pollutants: nitrogen dioxide, sulfur dioxide, PM_{10} and $PM_{2.5}$ particulate matter, carbon monoxide, ozone, and lead. The primary regulated particulate is PM_{10}, particulate matter 10 microns or less in diameter. Materials in this size range are considered inhalable because they generally pass into the human respiratory system. Standards for $PM_{2.5}$, particulate matter 2.5, a subset of PM_{10} including the smaller particle sizes, are being phased in by the U.S. Environmental Protection Agency.

Pursuant to the Clean Air Act, the U.S. Environmental Protection Agency has developed classifications for distinct geographic regions known as Air Pollution Control Regions. In Nevada, the Air Pollution Control Regions are largely analogous with hydrographic basins. Under these classifications, an area (an Air Pollution Control Region or portion there of) is classified as follows for each federal criteria pollutant:

- "Attainment" if the area has "attained" compliance with (that is, not exceeded) the adopted National Ambient Air Quality Standards for that pollutant.
- "Non-attainment" if the levels of ambient air pollution exceed the National Ambient Air Quality Standards for that pollutant.
- “Maintenance” if the monitored pollutants have fallen from non-attainment levels to attainment levels.

Areas for which sufficient ambient monitoring data are not available are designated as "attainment, unclassifiable" for those particular pollutants.

In addition to the designations relative to attainment of the National Ambient Air Quality Standards, the Clean Air Act requires the U.S. Environmental Protection Agency to place selected areas within the United States into one of three classes which are designed to limit the deterioration of air quality when it is "better than" the National Ambient Air Quality Standards. "Class I" is the most restrictive air quality category and was created by Congress to prevent further deterioration of air quality in National Parks and Wilderness Areas of a given size which were in existence prior to 1977 or in additional areas that have since been designated Class I under federal regulations (40 Code of Federal Regulation 52.21). All remaining areas outside of the designated Class I boundaries were designated Class II areas, which allows a relatively greater deterioration of air quality, although still below National Ambient Air Quality Standards. No Class III areas have been designated.

Federal Prevention of Significant Deterioration regulations limit the maximum allowable increase in ambient particulate matter in a Class I area resulting from a major or minor stationary source to 4 $\mu g/m^3$ (annual geometric mean) and 8 $\mu g/m^3$ (24-hour average). Increases in other criteria pollutants are similarly limited. Specific types of "listed facilities" that emit, or have the potential to emit, 100 tons per year or more of particulate matter (PM), PM_{10}, or other criteria air pollutants, or any facility that emits, or has the potential to emit, 250 tons per year or more of PM, PM_{10}, or other criteria air pollutants is considered a major stationary source. However, fugitive emissions are not counted as part of the determination of major source status for prevention of significant deterioration for non-listed facilities such as gold mines. Major stationary sources that may affect a Class I area are required to notify federal land managers of Class I areas. There are no Class I areas within 100 kilometers of the Proposed Action area. The Class I planning area nearest to the Proposed Action area, the Jarbidge Wilderness Area, is located approximately 130 miles (210 kilometers) north of the Proposed Action area. Neither the existing BMM project air pollutant emission sources nor the Proposed Action emission sources are major stationary sources subject to prevention of significant deterioration regulatory requirements.

The Class II pollution concentration limits are triggered for a planning area when an application for a major source affecting that planning area has been deemed complete by the regulatory authority (40 Code of Federal Regulation 52.21[b][14]). The closest triggered Class II planning area (Air Pollution Control Region 179) is located approximately 25 miles (40 kilometers) east of the facility. The planning area in which the facility is located has not been triggered for any pollutant.

New Source Performance Standards, also required under the Clean Air Act, are set by the U.S. Environmental Protection Agency for specific types of new or modified stationary sources. New Source Performance Standards set fixed emission limits for classes of sources to prevent deterioration of air quality from the construction of new sources and to reduce control costs by building pollution controls into the initial design of sources. In establishing New Source Performance Standards, the U.S. Environmental Protection Agency is required to consider cost, non-air impacts, and energy requirements. Certain project units used to process metallic minerals are subject to the New Source Performance Standards found in 40 Code of Federal Regulation Part 60, Subpart LL (Standards of Performance for Metallic Mineral Processing Plants).

The Clean Air Act Amendments of 1990 introduced a new facility-wide permitting program known as the Federal Operating Permit, or "Title V," program, that requires facilities with the potential to emit more than 100 tons per year of any regulated pollutant (excluding PM), 10 tons per year of any single hazardous air pollutant, or 25 tons per year or more of any combination of hazardous air pollutants to submit a Federal Operating Permit application.

The Clean Air Act directs the U.S. Environmental Protection Agency to delegate primary responsibility for air pollution control to state governments, which comply with certain minimum requirements. State governments, in turn, often delegate this responsibility to local or regional governmental organizations. The State Implementation Plan was originally the mechanism by which a state set emission limits and allocated pollution control responsibility to meet the National Ambient Air Quality Standards. The function of a State Implementation Plan broadened after passage of the Clean Air Act Amendments of 1990 and now includes the implementation of specific technology-based emission standards, permitting of sources, collection of fees, coordination of air quality planning, and prevention of significant deterioration of air quality within regional planning areas and statewide. Section 176 of the Clean Air Act, as amended, requires that federal agencies must not engage in, approve, or support in any way any action that does not conform to a State Implementation Plan for the purpose of attaining ambient air quality standards (Wooley, 1998).

Nevada State Air Quality Program

The Bureau of Air Pollution Control is the agency in the State of Nevada that has been delegated the responsibility for implementing a State Implementation Plan (excluding Washoe and Clark counties, which have their own State Implementation Plans). Included in the State Implementation Plan are the State of Nevada air quality permit programs (Nevada Administrative Code 445B.001 through 445B.3497, inclusive). Also, part of the State Implementation Plan is the Nevada State Ambient Air Quality Standards. The Nevada State Ambient Air Quality Standards are generally identical to the National Ambient Air Quality Standards, with the exception of the following: (a) an additional standard for carbon monoxide in areas with an elevation in excess of 5,000 feet above sea level; (b) the recently promulgated National Ambient Air Quality Standards for $PM_{2.5}$ (Nevada has yet to adopt the new standards); (c) the revised National Ambient Air Quality Standards for particulate matter of aerodynamic diameter less than 10 microns (PM_{10}); (d) ozone (Nevada has yet to adopt the new and revised standards); and (e) a violation of a state standard occurs with the first annual exceedance of an ambient standard, while federal standards are generally not violated until the second annual exceedance. In addition to establishing the Nevada State Ambient Air Quality Standards, the Bureau of Air Pollution Control is responsible for permit and enforcement activities throughout the State of Nevada.

The Proposed Action area is located in White Pine County, Nevada. The regulatory authority for air quality within White Pine County is the Nevada Bureau of Air Pollution Control. Before any construction of a potential source of air pollution can occur, an air quality permit must be obtained from the Bureau of Air Pollution Control.

The Bureau of Air Pollution Control permitting program implements the Title V federal operating permitting program, as well as the minor source permitting program for facilities that emit less than 100 tons per year of all criteria pollutants and are not a major source of hazardous air pollutants. BMM's current operations are regulated by three air quality operating permits. Operations at the BMM are permitted under the Bureau of Air Pollution Control's minor source permitting program via air quality operating permit AP1041-1362. The crushing circuit located at the BMM project area is permitted under permit AP1611-2227 for temporary sand and gravel processing. The Mooney Basin project operations were permitted under a Class III air quality operating permit AP1041-1336.

Barrick, in concert with the Bureau of Air Pollution Control, the U.S. Environmental Protection Agency, and three other mining companies participated in the Voluntary Mercury Reduction Program from 2001 to 2005. Using the data collected from that program, the Nevada Bureau of Air Pollution Control implemented the Nevada Mercury Control Program in March 2006 by regulation. The Nevada Mercury Control Program is designed by regulation to control mercury emissions from thermal units located at precious metal mines and mills. In the initial phase of the Nevada Mercury Control Program, data on thermal units and their controls are being collected throughout Nevada. This would be followed by the development of Maximum Achievable Control Technology standards for each type of thermal unit. The installation of Maximum Achievable Control Technology control devices would be the main requirement of the ensuing mercury permitting program under the Nevada Mercury Control Program (Enviroscientists, 2008).

3.14.2 Air Quality Environmental Consequences

The primary indicator of air quality impacts would be the Nevada and U.S. Environmental Protection Agency National Ambient Air Quality Standards. The U.S. Environmental Protection Agency–defined Significant Contribution Levels would be used as indicators for Class I and Class II airsheds (there are no Class I areas within 100 kilometers of the BMM). These are enforced through air permitting requirements to protect public health.

The Nevada and National Ambient Air Quality Standards define air pollutant concentrations that are not to be exceeded in ambient air. Significant impact levels are quantitatively defined in U.S. Environmental Protection Agency regulations. The use of significant impact levels for indicators is conservative since no air permitting action has triggered a prevention of significant deterioration minor source baseline date that would make the significant contribution levels enforceable at Class I areas or any other area in the vicinity of the Proposed Action. Table 3-19 lists defined U.S. Environmental Protection Agency and Nevada Bureau of Air Pollution Control impact thresholds and impact limits for criteria air pollutants. For this analysis, ambient air quality impacts are considered minor when predicted impacts are below the Class I SILs, moderate when predicted impacts exceed the SILs but remain below the national and Nevada Ambient Air Quality Standards, or major when predicted impacts exceed the national or Nevada Ambient Air Quality Standards.

Though there are no mercury ambient air quality standards, BMM had modeling performed by Air Sciences to assess the mercury ambient air quality impact (Air Sciences, 2008). Based on 2007 BMM mercury emissions, the deposition impacts from the Nevada gold mines at the watersheds bordering Nevada with Idaho and Utah are between 0.06 percent and 6.35 percent of the total impact. Impacts from BMM range from 0.01 percent to 0.14 percent.

Table 3-19 summarizes significant impact levels, as well as State of Nevada and National Ambient Air Quality Standards, for all U.S. Environmental Protection Agency–defined criteria air pollutants.

The U.S. Environmental Protection Agency has supported development of a set of air quality dispersion models to estimate ambient air quality impacts in areas surrounding air pollutant emission sources. The U.S. Environmental Protection Agency recommends the use of the model most appropriate for the application based upon the nature and extent of the emission sources, the distance to potential off-site receptors, and the intervening terrain.

To assess ambient air quality impacts off-site as a result of the Proposed Action, the U.S. Environmental Protection Agency–approved model AERMOD was applied. As documented in the Air Quality Modeling Report in Appendix H, AERMOD, one of the most frequently used regulatory dispersion models in the United States since it replaced ISCST3 in U.S. Environmental Protection Agency guidance, is the most appropriate of the U.S. Environmental Protection Agency–approved models given the site's physical characteristics and the variety of facility emission sources. Therefore, AERMOD was used to estimate potential off-site impacts as a result of maximum activity levels anticipated under the Proposed Action.

TABLE 3-19 MODELING SIGNIFICANCE LEVELS AND AMBIENT AIR QUALITY STANDARDS

POLLUTANT	AVERAGING PERIOD	U.S. ENVIRONMENTAL PROTECTION AGENCY-DEFINED CLASS II SIGNIFICANT CONTRIBUTION LEVEL[1] (SIL) ($\mu G/M^3$)	NATIONAL AAQS ($\mu G/M^3$)	NEVADA AAQS ($\mu G/M^3$)
Nitrogen Oxide	Annual	1	100	100
Sulfur Dioxide	Annual	1	80	80
	24 hours	5	365[2]	365
	3 hours	25	1,300[2]	1,300
Carbon Monoxide	8 hours	500	10,000[2]	10,000[3]
	1 hour	2,000	40,000[2]	40,000
PM_{10}	Annual	1	Revoked[4]	50
	24 hours	5	150[2]	150
$PM_{2.5}$	Annual	NA	15[5]	NS
	24 hours	NA	35[6]	35[6]
Lead	Quarterly	NA	1.5	1.5
Ozone	1 hour	NA	235[2]	235
	8 hour	NA	146.9[7]	NS

$\mu g/m^3$ = Microgram per cubic meter.
AAQS = Ambient Air Quality Standards.
NA = Not applicable.
NS = No state standard formally adopted.
[1] EPA, 1990.
[2] Applicable only in nonattainnment areas, not to be exceeded more than once per calendar year, 195 in Lake Tahoe Basin.
[3] 6,670 $\mu g/m^3$ at areas equal to or greater than 5,000 feet above mean sea level.
[4] U.S. Environmental Protection Agency revoked this standard effective December 17, 2006.
[5] 3-year weighted average.
[6] 3-year average of annual 98th percentile value.
[7] 3-year average of 4th maximum.

Proposed Action

For the purposes of analyzing the air quality impacts, the Proposed Action included the estimated emissions from future operations of the combined BMM and Mooney Basin Operations for an optimum operating scenario of the two larger open pits, North Pit and Top/Sage Complex, wherein the North Pit mining rate was 95,000 tons per day and the Top/Sage Complex mining rate was 125,000 tons per day. Ore from these mining operations would be delivered to the expanded BMM 2/3 Leach Pad and the expanded Mooney Basin Pad. Point source emissions were estimated for full production of loaded carbon through the BMM and Mooney Basin process facilities.

Stationary Process Point and Volume Source Air Pollutant Emissions

Under the Proposed Action the BMM would remain a Class II source with emissions below the Prevention of Significant Deterioration major source threshold. Table 3-20 provides a summary of the potential to emit criteria air pollutants from the Proposed Action. These are the emissions estimates that are expected to be requested as emission limits in an air permit application. The summary includes all on-site operational emissions: point sources (modeled as single point releases) include thermal sources, combustion sources, and a silo. Volume sources (modeled as three-dimensional releases) include crushing and transferring, and conveying and stacking. Not included are commuter vehicles and some on-site vehicular traffic or equipment operation not related to production. These emission rates are based upon conservative assumptions that the site operates at full-load operations at the high end of the requested range of emission rates and all support systems operate sufficiently to support continuous operation. Actual operations do not typically reach the emission rates at potential maximum operation.

TABLE 3-20 STATIONARY PROCESS POINT AND VOLUME SOURCES POTENTIAL TO EMIT

POLLUTANT	POTENTIAL TO EMIT (TONS/YEAR)
Particulates as PM_{10}	45.2
Sulfur Dioxide	3.4
Carbon Monoxide	4.4
Oxides of Nitrogen	24.7
Volatile Organic Compounds	0.86

Source: Enviroscientists, 2008.

These potential-to-emit rates qualify the facility as a Nevada Class II source as defined under Nevada air quality regulations. The air quality impact analyses and their results are discussed under Ambient Air Quality Impacts.

Mercury Emissions

Mercury is a naturally occurring element in many soils, volcanic rocks, and marine and geothermal water sources. It assumes many forms and can be found naturally in the environment as free metallic mercury, chemically combined with other elements in a number of soil or rock types, and in the form of methylmercury in the biosphere. Mercury is generally present in the atmosphere in one of three chemical forms: gaseous elemental mercury, gaseous reactive mercury, or particulate mercury.

Particulate mercury is present naturally in the soils, overburden, and ore at the mine; therefore, it would be present as a small fraction of all particulate emissions produced during the various mine processes. Material handling; primary, secondary, and tertiary crushing; conveying; and stacking are potential emission sources of particulate mercury. Controls would be applied to each of the processes to reduce overall particulate emissions (Enviroscientists, 2008). Mercury emissions from fugitive dust at the mine (0.27 lbs/year) were estimated using an average mercury concentration of 1.726 ppm in the PM_{10} ore dust emissions from area sources (Dickerson, 2008). The weighted average of mercury concentrations in ore from drill hole data from 2008 is 3.16 ppm (Zietlow, 2009).

Thermal sources of mercury emissions associated with each of the two refining processes in the Proposed Action include the refining furnace, carbon kiln, retort, and electrowinning cells. All refining for the Proposed Action would occur at the refining facilities at the Mooney Basin Heap Leach Pad and at the BMM refinery. Mercury emissions will continue to be controlled as required by the Nevada Mercury Control Program as shown in Table 3-21.

TABLE 3-21 MERCURY EMISSIONS CONTROLS ON THERMAL SOURCES INSTALLED IN JANUARY 2009

THERMAL SOURCE	EXISTING CONTROL[1]	PROPOSED NVMACT CONTROLS[1]
Refinery furnace	Baghouse	Baghouse and carbon beds
Carbon regeneration kiln	Demister followed by carbon bed	Demister followed by carbon bed

THERMAL SOURCE	EXISTING CONTROL[1]	PROPOSED NVMACT CONTROLS[1]
Retort	Condenser followed by carbon bed	Condenser followed by carbon bed
Electrowinning cells	Spray chamber	Spray/cooling chamber, demister, heater, and carbon beds

[1] Future controls will be compliant with Nevada Maximum Achievable Control Technology (NvMACT) for mercury.

BMM is required to provide the total mercury emissions annually. Mercury speciation values are estimated in Table 3-22 from the most recent Ontario Hydro Method stack test data collected in July and August of 2007.

TABLE 3-22 MERCURY EMISSIONS FROM THERMAL SOURCES

SOURCE DESCRIPTION	Hg0 (POUNDS PER YEAR)	Hg2 (POUNDS PER YEAR)	HgP (POUNDS PER YEAR)	TOTAL Hg (POUNDS PER YEAR)
Carbon kiln	0.067	0.002	0.003	0.072
Electrowinning cells	46.25	0.19	0.00	46.44
Retort	0.024	0.004	0.000	0.029
Furnace	7.61	0.14	0.00	7.75
De minimis equipment	1.341	0.992	0.791	3.125
Facility Total	**55.3**	**1.3**	**0.8**	**57.4**

Hg - mercury
Hg0 – elemental mercury
Hg2 – divalent gaseous mercury
HgP – particulate mercury

The 57.4 pounds HG/year value shown in Table 3-22 reflects current conditions and emissions controls at BMM. Estimated mercury under the Proposed Action assuming similar rock characteristics and following the installation of remaining Nevada Maximum Achievable Control Technology controls as shown in Table 3-21 is 14.2 pounds mercury/year (EPA, 2001 and Lewis, 2008). This results in a reduction of 43.2 pounds per year or a 75% reduction in the mercury emissions from the BMM.

Area Source Emissions

Operation at the mine site for the Proposed Action involves area source emissions (modeled as two-dimensional releases). These include fugitive emissions from drilling, blasting, loading, unloading, wind erosion, haul roads, and dozing. Also included are tailpipe emissions from equipment and haul road vehicles. Table 3-23 shows the potential to emit for these emissions.

TABLE 3-23 STATIONARY PROCESS AREA SOURCE POTENTIAL TO EMIT

POLLUTANT	POTENTIAL TO EMIT (TONS PER YEAR)
Particulates as PM_{10}	544.7
Sulfur Dioxide	280.9
Carbon Monoxide	3510.2
Oxides of Nitrogen	5945.7
Volatile Organic Compounds	445.3

Source: Enviroscientists, 2008.

Commuter and Supply Vehicle Emissions
All passenger vehicles have tailpipe emissions. BMM presently employs approximately 180 to 210 full-time and 50 to 100 contract employees. Employees are transported via buses to the mining areas from Elko, Ely, and Eureka.

There are three main access routes to the Proposed Action area:

- From Elko via State Highway 228 (Jiggs Highway) south;
- From Ely and Eureka via U.S. Highway 50 to State Route 892 (Strawberry Highway); and
- From Ely via U.S. Highway 50 to Long Valley Road.

Total tailpipe emissions for commuter buses were calculated based on a traveling distance of 175 miles per day during site construction, 40 miles one way (80 miles round trip) of which are on unpaved roads. Two buses are used to transport employees. The average heavy duty diesel vehicle emission factor was based on the U.S. Environmental Protection Agency MOBILE6 program using default values. In addition to commuter buses, it is estimated that supply vehicles make four round trips per day covering the same distance and road routes. Table 3-24 summarizes the calculations of total potential emissions for commuting and delivery resulting from existing BMM operations.

TABLE 3-24 EMPLOYEE AND SUPPLY VEHICLE TAILPIPE EMISSIONS

VOLATILE ORGANIC COMPOUNDS (TONS PER YEAR)	CARBON MONOXIDE (TONS PER YEAR)	NITROGEN OXIDE (TONS PER YEAR)	PM_{10} (TONS PER YEAR)	SULFUR DIOXIDE (TONS PER YEAR)
0.71	5.31	4.44	0.13	0.01

Should employees drive a light duty gasoline vehicle instead of taking the bus, emissions per vehicle would increase by approximately 11 percent for volatile organic compounds, 16 percent for carbon monoxide, 1 percent for nitrogen oxide, 1 percent for particulate as PM_{10}, and 17 percent for sulfur dioxide.

In addition to tailpipe vehicular emissions by commuter buses and delivery trucks, fugitive PM_{10} emissions would occur from re-entrained dust from road surfaces. The same inputs regarding number of employees and use of buses, and supply vehicles described above were used to estimate fugitive dust emissions. Emission factors were developed, and PM_{10} emissions were calculated. Emission factors for paved road travel were calculated based on an average vehicle weight of 22.5 tons and surface silt content of 8.5 percent. The paved road traveling distance is estimated to be 95 miles round trip per day. Emission factors for unpaved road travel were calculated based on a surface silt content of 18.4 percent, an average vehicle weight of 22.5 tons, and 90 mean days with 0.01 inch or more of precipitation. Travel over unpaved roads was estimated at 80 miles round trip per day. The maximum PM_{10} fugitive emissions resulting from employees commuting and material deliveries for the existing BMM operations were estimated to be 447 tons per year. It is noted that all estimated commuter emissions as described above are for the continued use of established, public roadways already in existence, and not new access roads specific to the Proposed Action.

Greenhouse Gas Emissions
Recent scientific evidence suggests there is a direct correlation between global warming and emissions of greenhouse gases. Greenhouse gases include carbon dioxide, methane, nitrogen oxide, and ozone. Although many of these gases occur naturally in the atmosphere, man-made sources substantially have increased the emissions of greenhouse gases over the past several

decades. Of the man-made greenhouse gases, the greatest contribution currently comes from carbon dioxide emissions.

Greenhouse gases emissions associated with the proposed project primarily would be associated with the consumption of energy for mining and ore processing over the life of the mine. Operations that would contribute to greenhouse gases emissions would include:

- Fuel consumption (vehicles and machinery); and
- Electricity consumption (machinery, milling, heap leach water circulation, dewatering).

The estimated annual fuel and electrical power consumption under the Proposed Action are 7.7 million gallons and 10,900 mega watts per hour, respectively. The current national annual emissions of greenhouse gasses are approximately eight billion tons (EPA, 2008). Under the Proposed Action with fuel and energy consumption as described above, estimate greenhouse gas emissions from the project would be approximately 102,000 tons annually or approximately 0.002 percent of the national annual emissions.

Access Road Corridors
Current activity levels include the buses and limited private vehicle traffic transporting staff to and from the mine site and supply trucks bringing mine supplies. The sections above document the quantities of emissions associated with vehicular traffic to and from the mine. The approaching stretch of each of the two access roads is gravel surfaced, cutting down vehicle speeds but potentially increasing particulate emissions in the form of dust. There are few, if any, sensitive receptors in the direct impact area. The only property with human residence close to either access road in the area of analysis is a Barrick-owned ranch that rents space to mine contractor employees. That ranch and rental property is along a paved section of road at or beyond the edge of the direct impact area.

Ambient Air Quality Impacts
Dispersion modeling was conducted for the four criteria air pollutants (PM_{10}, carbon monoxide, nitrogen oxide, and sulfur dioxide) proposed to be emitted from the BMM above Nevada Division of Environmental Protection modeling thresholds (Enviroscientists, 2008). The U.S. Environmental Protection Agency–approved model AERMOD was applied consistent with Nevada Division of Environmental Protection and U.S. Environmental Protection Agency guidance to assess dispersion of those pollutants and potential impacts beyond the activity areas in the Proposed Action. Impacts were predicted at model receptors at 100-meter intervals along the Plan of Operations boundary and on a large Cartesian grid of receptors at 3,000-meter intervals beyond to cover a total area of 102 kilometers by 72 kilometers encompassing all areas with predicted impacts exceeding U.S. Environmental Protection Agency significant contribution levels. A model receptor was also placed at the site of one sensitive receptor, Gallagher State Fish Hatchery at the Ruby Lake National Wildlife Refuge, the nearest sensitive Class II area, to assess potential impacts there. All model sources and receptors utilized elevations calculated from U.S. Geological Survey 30-meter Digital Elevation Model data. For each averaging period for which a National Ambient Air Quality Standard exists, model sources were modeled under a scenario consistent with maximum operations under the Proposed Action. Ozone formation due to atmospheric transformation of project emissions is expected to be minimal because emissions are below Prevention of Significant Deterioration major source thresholds. Ozone formation was estimated using the Scheffe method consistent with Nevada Division of Environmental Protection guidance (Enviroscientists, 2008). The air quality modeling analyses verified that the furthest extent of significant contributions resulting from the Proposed Action ended well short of the Jarbidge Wilderness and all other Class I areas.

Air quality modeling also showed all predicted maximum impacts would occur on the Plan of Operations boundary, miles short of the nearest residence or area of regular human activity. The ratio of $PM_{2.5}$:PM_{10} for fugitive dust sources is approximately 0.15 (Pace, 2004; WRAP, 2006). This ratio is used in Table 3-25 to compare worst-case operation $PM_{2.5}$ ambient concentrations to the $PM_{2.5}$ National Ambient Air Quality Standards. Table 3-23 shows that the model-predicted maximum concentrations are well below the Nevada and National Ambient Air Quality Standards for all criteria pollutants at the facility property boundary.

TABLE 3-25 MODEL-PREDICTED MAXIMUM IMPACTS OF PROPOSED ACTION

Pollutant	Averaging Time	Highest Modeled Receptor Point					Lowest Applicable Ambient Standard
		Receptor Location[1]		Dispersion Modeling Results	Background Conc.	Maximum Ambient Conc.	
		UTM East (m)	UTM North (m)	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
PM_{10}	24-Hour	630,964	4,420,316	70.59	10.2	80.8	150
	Annual	630,964	4,420,266	5.90	9.0	14.9	50
$PM_{2.5}$	24-Hour	630,964	4,420,316	10.59	10.2[2]	20.8	35
	Annual	630,964	4,420,266	0.89	9.0[2]	9.9	15
Sulfur Dioxide	3-Hour	630,886	4,418,190	459.28	28.6	487.9	1,300
	24-Hour	630,886	4,418,340	97.84	18.3	116.14	365
	Annual	623,571	4,421,339	3.17	5.3	8.47	80
Carbon Monoxide	1-Hour	620,362	4,426,563	7,825	3,771	11,596	40,000
	8-Hour (< 5,000')	626,482	4,423,522	3,589	1,666	5,255	10,000
	8-Hour (≥ 5,000')	626,482	4,423,522	3,589	1,666	5,255	6,667
Ozone	1-Hour	-	-	197	141	197	235
Nitrogen Dioxide	Annual	623,571	4,421,339	67.9	9.43	77.3	100

[1] All coordinates in UTM projection, North American Datum 1927.
[2] $PM_{2.5}$ background very conservatively estimated as equal to PM_{10} background.
Source: Enviroscientists, 2008.

Table 3-26 documents the impacts at the identified sensitive receptor, the Gallagher State Fish Hatchery at the Ruby Lake National Wildlife Refuge. The table also documents the U.S. Environmental Protection Agency- and Nevada Division of Environmental Protection-defined significant contribution levels (Enviroscientists, 2008).

The air quality modeling analyses verified that the farthest extent of significant contributions resulting from the Proposed Action end well short of the Jarbidge Wilderness and all other Class I areas. Significant contributions of sulfur dioxide were limited to the immediate vicinity of the Plan of Operations boundary. The largest contributions for nitrogen oxide were estimated to be less than 15 miles in all other directions and less than 25 miles to the east. Tables 3-25 and 3-26 show that the maximum predicted air concentration of both acid rain precursors are below the significant impact levels, showing no significant contributions of those pollutants. A small section of the southernmost portion of the Ruby Lake National Wildlife Refuge drainage is expected to have minimal air concentrations of nitrogen oxide (less than one percent). The

Proposed Action would result in air quality impacts well within applicable impact limits in all areas and in insignificant contributions to air quality at all identified sensitive receptors.

TABLE 3-26 MODEL-PREDICTED MAXIMUM IMPACTS OF PROPOSED ACTION AT THE GALLAGHER STATE FISH HATCHERY SENSITIVE RECEPTOR

Pollutant	Averaging Time	Highest Modeled Concentration Gallagher State Fish Hatchery (μg/m³)	Lowest Applicable Ambient Standard (μg/m³)	Significant Contribution Level (μg/m³)
PM_{10}	24-Hour	1.88	150	5
	Annual	0.05	50	1
Carbon Monoxide	1-Hour	486.92	40,000	2,000
	8-Hour (< 5,000')	128.71	10,000	500
	8-Hour (≥ 5,000')	128.71	6,667	500
Nitrogen Dioxide	Annual	0.49	100	1
Sulfur Dioxide	3-Hour	2.60	1,300	25
	24-Hour	0.35	365	5
	Annual	0.02	80	1

Source: Enviroscientists, 2008.

The primary emissions from the Proposed Action not included in the modeling impact analysis are the emissions from traffic bound to the mine. During operational periods, the impacts from mine-bound traffic would be comparable to impacts currently observed. Those impacts are expected to be minor and limited to intermittent periods of traffic at the few isolated areas of human activity along the primary access routes. Traffic levels would be higher during the construction phase, but only the few ranches closest to the most heavily traffic routes would see more than minor impacts from road dust. Given the facility's restriction on public access and meeting the Mine Safety Health Administration worker health safety standards, public exposure to hazardous materials through the air pathway would be well below allowable limits.

Indirect Impacts of Action Alternatives

The result of any action alternative would be an increase in employment at the mine site during construction and then a slight increase in employment at the mine site during the operational phase. Delivery shipments would increase during construction and then remain near current levels. The net result would be a temporary increase in population and economic activity in access communities to the north and south during construction estimated at under 10 percent and then an increase of a few percentage points during the operational phase. That increased activity would likely result in a comparable percentage increase in vehicular traffic and household activity that would be difficult to estimate but would be expected to generate a similar percentage increase in population and lifestyle-generated emissions of air pollutants in and around the surrounding communities.

Alternative A – Partial Backfill Alternative

This alternative would result in a net reduction of up to 11 percent from earth-moving emissions due to a reduction in disturbed areas of up to 434 acres. PM_{10} earth-moving construction and operation emissions would be less than with the Proposed Action. Equipment, site operation, and employee-commuting emissions would be essentially unchanged from those associated with the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Under this alternative, there would be a small decrease in acres of disturbance compared with the Proposed Action. This would likely result in a proportional decrease in earth-moving emissions. Equipment, site operation, and employee-commuting emissions would be essentially unchanged from those associated with the Proposed Action.

No Action Alternative
This alternative would not result in any additional construction or operational air emissions associated with this project. Current mining activity would cease in 2009. Reclamation would occur for a few years, likely with air quality impacts at or below current mine operational air quality impact levels. After reclamation is completed in 2012, there would be no operational air quality impacts, and particulate emissions from wind erosion at the mine site would be diminished as a result of the reclamation effort. The post-reclamation period would see the currently minor air quality impacts in the Proposed Action area decrease to no impact as the reclaimed land establishes the same resistance to wind erosion as surrounding undisturbed land.

3.15 Visual Resources

This section describes visual resources in the Proposed Action area and the BLM's Visual Resource Management system, which is used in the analysis. This section also describes the Key Observation Points that were used to describe existing conditions and assess potential impacts of the Proposed Action and alternatives on visual resources.

3.15.1 Visual Resources Affected Environment

The visual resources analysis area consists of an approximately 200-square-mile area of the Ruby Mountains south of the Pony Express Trail, the adjacent portions of Huntington Valley and Newark Valley on the west, and Long Valley on the east (Figure 3-20).

The BLM's Visual Resource Management system provides a means to measure the scenic value of an area's visual resources so that the area can be appropriately managed (BLM, 1986a, 1986b, 1998a, 1998b). The Visual Resource Management system can also be used to analyze potential visual impacts and apply visual design techniques to minimize impacts on the landscape. The Visual Resource Management system consists of an inventory stage and an analysis stage. The inventory stage involves identifying and inventorying visual resources using BLM's visual resource inventory process. The analysis stage involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from representative or selected key travel routes and/or observation points. A Resource Management Plan establishes how public lands would be used and managed for different purposes. Visual resources are considered in development of a Resource Management Plan, and are assigned one of four Visual Resource Management classes. Management objectives of the Visual Resource Management classes are as follows:

Class I Objective. The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude limited management activity. The level of change to the characteristic landscape should be low and must not attract attention.

Class II Objective. The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III Objective. The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV Objective. The objective of this class is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of basic elements.

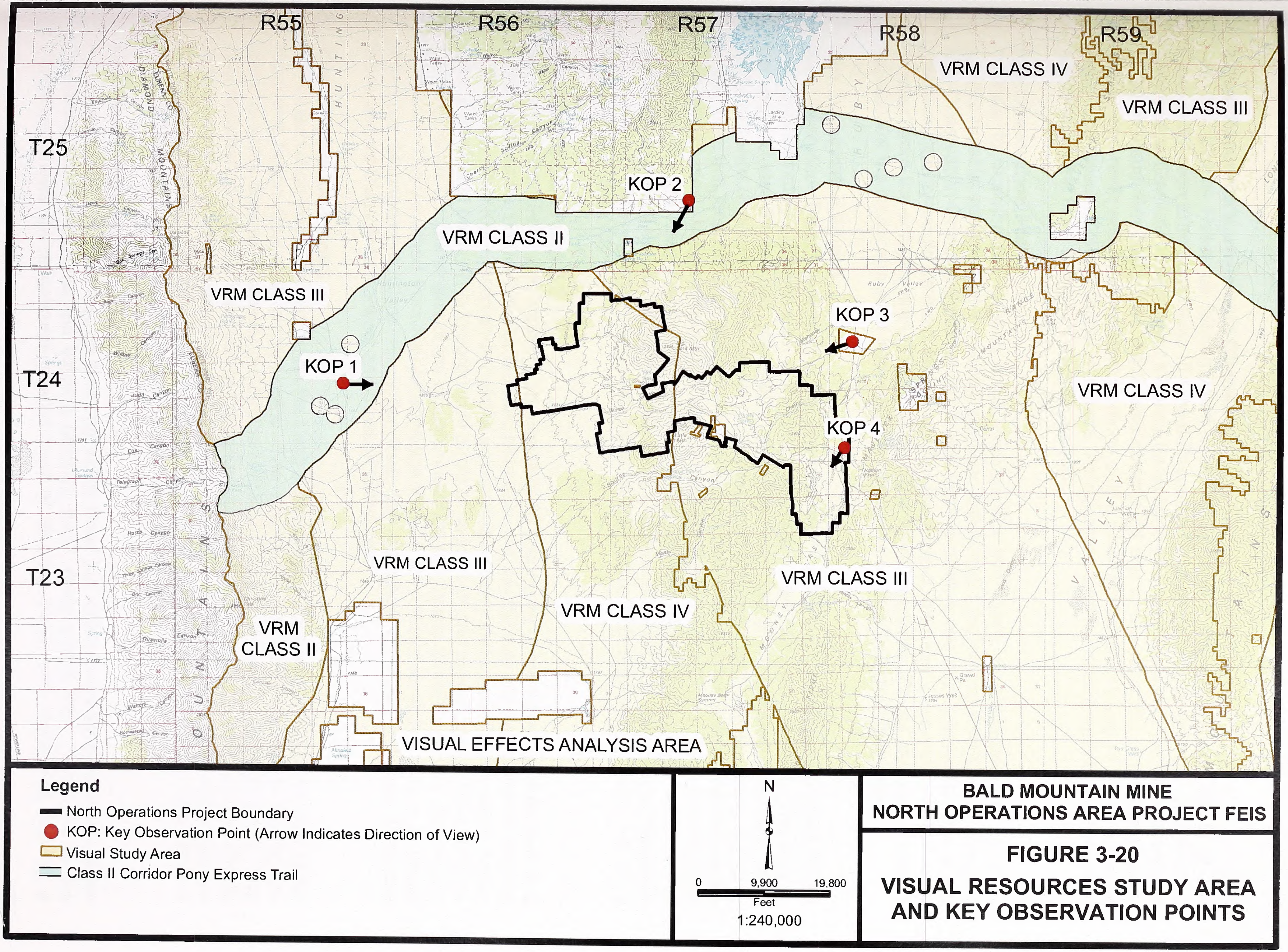
The Visual Resource Management system also subdivides landscapes into three distance zones based on relative visibility from travel routes or observation points. The three zones are foreground-middle ground, background, and seldom seen. The foreground-middle ground zone includes areas seen from highways, rivers, or other viewing locations that are within three to five miles of the observation point. The background zone is generally considered to include areas beyond the foreground-middle ground zone but usually less than 15 miles away. The seldom-seen distance zone is defined as the portion of the landscape that is not visible from the observation point or the portion that is visible but more than 15 miles distant.

Existing Conditions

The Proposed Action area is located in the Ruby Mountains near Bald Mountain. The Proposed Action area is bounded by Newark Valley and Huntington Valley on the west and by Long Valley on the east. Alluvial fans slope from the mountain foothills to the valleys on the east and west sides. Vegetation in the Proposed Action area consists mostly of gray-green sagebrush scrub at lower elevations and dark green pinyon-juniper forest at higher elevations. Past mining activity in the area has created areas of light tan rock disposal areas and heap leach pads that contrast strongly with the darker natural vegetation. The existing disturbance is visible from the valleys on both the east and west sides.

There are no heavily traveled highways, rest stops, scenic overlooks, or other attractions in the vicinity that would create important viewing locations for large numbers of travelers. The closest paved road is State Route 892, which is approximately six miles from the Proposed Action area. The highway is paved from U.S. Highway 50 north to the mine turnoff. The Long Valley Road connects U.S. Highway 50 with the Ruby Lake National Wildlife Refuge and the eastern slopes of the Ruby Mountains. This road is paved for about 25 miles north of U.S. Highway 50.

The Pony Express Trail crosses the Ruby Mountains at Overland Pass, about two miles north of the Proposed Action area at its closest point. (Figure 3-20) The views from the Pony Express Trail itself are generally restricted by topography and trees, and distant vistas open up only infrequently. West of Overland Pass, in particular, the Pony Express Trail follows Big Wash through a shallow canyon and the view from the Pony Express Trail remains limited until the Trail descends into Huntington Valley. The existing BMM can only be seen from select spots along the Trail and then only for short periods of time. The mine is more visible from Huntington Valley, but is further away at this point.



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-20

VISUAL RESOURCES STUDY AREA AND KEY OBSERVATION POINTS

Visual Resource Management Classes

The Ely District Resource Management Plan has identified the eastern two thirds of the Proposed Action area as a Class III Visual Resource Management area, with the western third identified as Class IV. The current Mooney Basin Mine and top pit region of the BMM is within a Class III Visual Resource area which was designated due to the proximity of the Long Valley Road. The north and lower western portions of the BMM are within a Class IV visual resource area. The closest Class II Visual Resource Management area is located north of the Proposed Action along the Pony Express Trail (Figure 3-20).

Key Observation Points

In order to describe the existing visual environment and make an assessment of potential project impacts, representative viewing locations called Key Observation Points were selected. Key Observation Points are points on a travel route or from a use area where the view of the proposed activity would be most revealing. For this project, four Key Observation Points were selected from the analysis area (Figure 3-20). The Key Observation Points and existing visual condition of the landscape seen from each Key Observation Point are described below.

Key Observation Point 1

Key Observation Point 1 is located at the intersection of the Pony Express Trail and State Route 892, approximately 4.7 miles west of the Proposed Action area at its closest point. The view to the east includes the tan and gray-green valley floor with dark green forested mountains rising in the distance (Figure I-1 in Appendix I). Disturbance from past and current mining is clearly visible from this location even though the entire disturbance is over five miles away and in the background zone. Visible disturbance includes the North Area Rock Disposal Area on Big Bald Mountain, the 2/3 Heap Leach Pad and RBM Rock Disposal Area in the center, and the Rat Rock Disposal Area on Little Bald Mountain. Key Observation Point 1 is within Visual Resource Management Class II and the disturbances visible from that observation point are in a Management Class IV.

Key Observation Point 2

Key Observation Point 2 is located approximately 80 feet south of the Pony Express Trail at a location where the north slopes of Big Bald Mountain and the foothills are visible from a clearing in the trees. This Key Observation Point is approximately three miles from the Proposed Action area at its closest point. The foreground is a mix of sagebrush and pinyon-juniper forest (Figure I-1 in Appendix I). The slopes of the mountain foothills are mostly forested, and no disturbance is visible. The viewshed from Key Observation Point 2 for a distance of one mile is in Visual Resource Management Class II. After that, the viewshed is within a Visual Resource Management Class IV to the west and Class III to the east.

Key Observation Point 3

Key Observation Point 3 is located on the Long Valley Road, approximately 2.2 miles east of the Proposed Action area at its closest point. The view to the southwest shows the sagebrush-covered valley floor with forested mountains in the background (Figure I-2 in Appendix I). The only disturbance visible is a portion of the lighter-colored East Sage Rock Disposal Area that is approximately 3.3 miles away and partially hidden by hills on both sides. Most of the view on from Key Observation Point 3 is within Visual Resource Management Class III. The Class II viewshed around the Pony Express Trail is about five miles to the north.

Key Observation Point 4

Key Observation Point 4 is also on the Long Valley Road just inside the eastern boundary of the Proposed Action area near the existing Mooney Basin Heap Leach Pad. The view to the southwest shows the sagebrush-covered floor of Mooney Basin with mountains forming a backdrop (Figure I-2 in Appendix I). Existing disturbance visible from Key Observation Point 4 includes a portion of the existing leach pad, some dirt roads in the distance, and a few wooden power poles. Mooney Basin is within a Visual Resource Management Class III viewshed. (Figure 3-20).

3.15.2 Visual Resources Environmental Consequences

Proposed Action

Anticipated environmental impacts to visual resources include changes in line, form, color, and texture that result from vegetation clearing and construction of pits, rock disposal areas, and other facilities. This section provides a general description of proposed facilities that could affect visual resources, describes potential impacts, and determines Visual Resource Management consistency of the Proposed Action and Alternatives. Cumulative impacts are discussed in Section 4.15.

The assessment of visual impacts is based on impact criteria and methodology described in the BLM Visual Contrast Rating System (BLM, 1986b). Two issues are addressed in determining impacts: (1) the type and extent of actual physical contrast resulting from the Proposed Action and (2) the level of visibility of a facility, activity, or structure. Impacts are considered high if visual contrasts that result from landscape modifications affect the quality of any scenic resources; scenic resources having rare or unique values; views from, or the visual setting of, designated or planned parks, wilderness areas, natural areas, or other visually sensitive land uses; views from, or the visual setting of, travel routes; and views from, or the visual setting of, established, designated, or planned recreational, educational, or scientific facilities, use areas, activities, viewpoints, or vistas. Appendix I contains Visual Contrast Rating Worksheets that are based on field examinations of the visual settings of each Key Observation Point. The forms describe the existing conditions of the characteristic landscape seen from each Key Observation Point, types of viewers, sensitivity of viewers, and other relevant information.

The extent to which elements of the Proposed Action would affect the visual quality of its viewshed depends on the degree of visual contrast between proposed facilities and existing landscape elements (form, line, color, and texture) and features (land and water surface, vegetation, and structures). Described below are potential impacts of the Proposed Action from the Key Observation Points. Visual simulations were developed for Key Observation Points 2, 3, and 4 to illustrate post-project conditions under the Proposed Action.

Key Observation Point 1

Even at a distance of almost five miles west of the Proposed Action area, the proposed disturbance would be visible from Key Observation Point 1 and would add to the contrast of existing mining disturbance with natural vegetation. During active mining, the proposed western rock disposal areas and 2/3 Heap Leach Pad would create a moderate level of contrast from those of existing conditions. This would meet the management goals for lands within a Class IV Viewshed. Following the active mining period, the rock disposal areas and heap leach pads would be recontoured and smoothed to make them more similar to natural landforms. After vegetation is established, the contrast with natural surroundings would be less noticeable and the reclaimed areas likely would not draw as much attention from viewers at Key Observation Point 1. Open pits and changes in form, color, and texture would remain indefinitely.

Key Observation Point 2

This existing view of the north slopes of Big Bald Mountain from near the Pony Express Trail shows an undisturbed landscape. Construction of North Area Rock Disposal Area would create a lighter-colored area that would contrast with the surrounding vegetated hillsides. Because the rock disposal area is over three miles away, the level of contrast would be moderate, but the rock disposal area could draw attention of viewers near the Pony Express Trail who are looking in that direction. It should be noted that the mine is only intermittently visible from the Pony Express trail near Key Observation Point 2, and only for short periods of time. The additional disturbance from the Proposed Action would be noticeable, but not dominating the occasional views that are found along the Trail.

Following the active mining period, the rock disposal area would be recontoured and smoothed to make it more closely resemble a natural landform. After vegetation becomes established, the contrast with natural surroundings would be less noticeable and the reclaimed area likely would not draw as much attention from viewers near the Pony Express Trail. Open pits and changes in form, color, and texture would remain indefinitely. The second photograph in Figure H-3 in Appendix H is a simulation of the view from Key Observation Point 2 during active mining. The third photograph in Figure I-3 in Appendix I is a simulation of the view from Key Observation Point 2 following successful reclamation.

Key Observation Point 2 is within a Class II viewshed that extends for one mile on either side of the Pony Express Trail. The mine disturbance that is visible from Key Observation Point 2 is within a Class IV viewshed. The boundary of the Class II viewshed is 0.6 miles from the Plan of Operation boundary at its closest point. Visual changes due to the proposed action are well within the management goals for a Class IV Visual Management area.

Key Observation Point 3
The East Sage Rock Disposal Area is the only disturbance presently visible in the view to the southwest from Key Observation Point 3 on Long Valley Road. The proposed expansion of the East Sage Rock Disposal Area would result in a much larger area of contrast. Although about three miles away, the expanded rock disposal area would draw the attention of observers because of the scale and its contrasting color and shape. At the conclusion of mining and after successful reclamation, the level of contrast would be reduced but would still likely be moderate because of the scale. The East Sage Rock Disposal Area is in Visual Resource Management Class III that allows for moderate change. During mining the contrast would be strong and would temporarily be outside of Class III management objectives. However, following reclamation the disturbance change again would be moderate and would meet objectives. Figure I-4 in Appendix I shows the current view, a simulation of the view from Key Observation Point 3 during active mining, and a simulation of the view from Key Observation Point 3 following successful reclamation.

Key Observation Point 4
The view to the southwest from Key Observation Point 4 on the Long Valley Road shows the Mooney Basin Valley and foothills behind. At present, a portion of the existing Mooney Basin Heap Leach Pad, a few wooden power poles, and dirt roads are visible. The proposed expansion of the leach pad would fill much of the valley. The leach pad would be approximately 1.5 miles long, up to 0.5 mile wide, and 7,175 feet above mean sea level at its highest point (approximately 225 feet above existing ground level). The leach pad would be highest on the north end and slope downward to the south. The scale of the leach pad and its color and shape would create a strong contrast with the existing view and would be outside of Class III Management objectives. After active mining is completed and the leach pad has been successfully reclaimed, the contrast would be reduced. Reclamation would include smoothing the sides of the leach pad and grading to a slope of 3H:1V for a more natural appearance. When graded to final contours and vegetated, the reclaimed leach pad would more closely resemble a natural landform. The degree of contrast would be moderate because of the scale and remaining differences in color compared with the surrounding undisturbed land. Figure I-5 in Appendix I shows the current view, a simulation of the view from Key Observation Point 4

during active mining, and a simulation of the view from Key Observation Point 4 following successful reclamation.

Overall perspective should be noted in this analysis. Mooney Basin Mine was in existence prior to the BLM designation of a Class III Visual Management Corridor along the Long Valley Road. Visual Class Designations were assigned to large regions as a whole, and site specific disturbances were not given special consideration during the designations. There are several mines and disturbances along the Long Valley Road near Key Observation Point 3 that have had strong visual contrast that did not meet Class III objectives during operations. However, it is believed that following reclamation, the visual contrast for all of these mine sites would be reduced to moderate and would then meet the management objectives. The Ely District Resource Management Plan allows for, and acknowledges, the visual disturbance of projects that have valid existing rights such as mining. Mitigations may be required based on the visual management class. For the Proposed Action, the concurrent and final reclamation that are required to meet the 43 CFR 3809 and Nevada State reclamation standards are the mitigations. BMM has a proactive history of meeting and exceeding these reclamation standards.

In summary, the views from Key Observation Points 1 and 2 would meet management objectives. The views from Key Observation Points 3 and 4 would not meet management objectives during mining, but would meet them after reclamation. Mitigation through reclamation first involves blending visual disturbance lines and form through recontouring to better match those of the existing landscape. This alone can greatly reduce the contrast, especially from a distance. Color and texture changes would proceed more slowly over time, since this is more dependent on successful reclamation and a return to the native climax community. The color and texture contrast from bare earth to the start of a vegetative community will reduce contrast rather quickly and dramatically. However, there would still be a color and texture contrast between the re-established vegetation and the surrounding undisturbed vegetation for a number of years. The contrast would slowly fade over time as the native vegetation begins to re-establish. In areas of Pinyon and Juniper, this could be 20 years or more. However, it should be noted that vegetation enhancement projects and natural fires also occur throughout the Class III area that have similar visual effects. Areas of contrasting color and form from the Proposed Action can blend in with other and more natural processes that create vegetative diversity throughout the region.

Alternative A – Partial Backfill Alternative
Under this alternative, selected pits would be backfilled with waste rock, reducing the area of disturbance and volume of some of the rock disposal areas. Compared with the Proposed Action, the effect on visual resources of a reduction in size of the rock disposal areas would be minimal. As viewed from Key Observation Point 1, any reduction in size of the rock disposal areas would likely be difficult to detect at a distance of five miles. There would be no change in impact to visual resources from Key Observation Point 2 because the only visible rock disposal area (Rock Disposal Area 3) is not proposed to be reduced under this alternative. As viewed from Key Observation Point 3, the reduction in size of the East Sage Rock Disposal Area would not measurably change the degree of contrast. Therefore, the level of impact to visual resources would be virtually the same as under the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Under this alternative, the footprint of the Mooney Basin Heap Leach Pad would be reduced from approximately 379 acres to 283 acres while the 2/3 Heap Leach Pad would be increased from approximately 350 acres to 630 acres. As viewed from Key Observation Point 1, the difference in size of the 2/3 Heap Leach Pad would likely be difficult to detect at a distance of five miles. There would be no change in impact to visual resources from Key Observation

Points 2 and 3 because the leach pads would not be visible. As viewed from Key Observation Point 4, the reduction in size of the Mooney Basin Heap Leach Pad, although considerable, would not change the degree of contrast. The color and scale of the smaller leach pad would still create a strong contrast during active mining and a moderate contrast following reclamation. Therefore, the level of impact to visual resources would be virtually the same as under the Proposed Action.

No Action Alternative
Under this alternative, gold mining activities would continue under the current authorizations for the BMM and Mooney Basin Operations Area. There would be no change in the level of authorized impacts to visual resources.

3.16 Noise and Vibration

Assumptions for Analysis
The following assumption was made for the noise and vibration analysis:

- Noise associated with the Proposed Action would be generated with similar equipment and at levels similar to those associated with the existing operation.

Noise attributes (pitch, loudness, repetitiveness, vibration, variation, duration, and the inability to control the source) determine how a receptor is affected. The study of noise involves three important characterizing parameters: pressure, power, and intensity. The power of an oscillating sound wave is composed of kinetic and potential energies. The intensity of a sound wave is defined as the average rate at which power is transmitted per cross-sectional area in the direction of travel. Noise versus sound is a subjective measurement, and thus a receptor's reaction to sound is a poor measurement of the effect of noise.

The Federal Noise Control Act of 1972 established a requirement that all federal agencies administer their programs to promote an environment free of noise that jeopardizes public health or welfare. The U.S. Environmental Protection Agency was given responsibility for implementing programs to assess noise and identify acceptable noise impacts.

The U.S. Environmental Protection Agency identifies outdoor noise limits to protect against effects on public health and welfare by an equivalent sound level (Leq), which is an A-weighted average measure over a given time. Outdoor limits of 55 A-weighted decibels Leq have been identified as desirable to protect against speech interference and sleep disturbance for residential areas and areas with educational and healthcare facilities. Sites are generally acceptable to most people if they are exposed to outdoor noise levels of 65 A-weighted decibels Leq or less, potentially unacceptable if they are exposed to levels of 65 to 75 A-weighted decibels Leq, and unacceptable if exposed to levels of 75 A-weighted decibels Leq or greater (EPA, 1981).

Generally, natural noise levels would be approximately 35 A-weighted decibels in rural areas away from communities and roads. Within a rural community, the man-made noise level ranges from 45 A-weighted decibels to 52 A-weighted decibels (EPA, 1981). The day-night sound level (the A-weighted equivalent sound level for a 24-hour period with an additional 10 decibels imposed on the equivalent sound levels for nighttime hours of 10 PM to 7 AM) in residential areas should not exceed 55 A-weighted decibels to protect against activity interference and annoyance (EPA, 1981). Table 3-27 presents typical sound levels in A-weighted decibels and subjective descriptions associated with various noise sources.

There are no State of Nevada noise standards directly applicable to the Proposed Action; however, Nevada Revised Statutes give county and city governments the right to implement noise restrictions. No such ordinances apply in the sections of White Pine County where the Proposed Action and associated project components would be located.

TABLE 3-27 SOUND LEVELS ASSOCIATED WITH ORDINARY NOISE SOURCES

NOISE SOURCE	NOISE LEVEL (A-WEIGHTED DECIBELS)	SUBJECTIVE DESCRIPTION
Commercial Jet Take-Off	120	Deafening
Road Construction Jackhammer	100	Deafening
Busy Urban Street	90	Very loud
Standard For Hearing Protection 8-Hour Exposure Permissible Exposure Limit (Mine Safety Health Administration) Action Level within Active Mining Facilities	90 85	Very loud Loud – to very loud
Construction Equipment at 50 feet	80-75	Loud
Freeway Traffic at 50 feet	70	Loud
Noise Mitigation Level for Residential Areas Federal Housing Administration	67	Loud
Normal Conversation at 6 feet	60	Moderate
Noise Mitigation Level for Undisturbed Lands (FHA)	57	Moderate
Typical Office (interior)	50	Moderate
Typical Residential (interior)	30	Faint

Source: Federal Highway Administration Highway Construction Noise Handbook (2006).

3.16.1 Noise and Vibration Affected Environment

Area of Analysis

An assessment of noise levels for any area requires an explanation of noise effects and consideration of the topography, climate, flora, and current ambient noise is required. For wildlife, the affected environment for noise impacts is usually limited to a distance of 880 yards (2,640 feet) from the source based on current wildlife studies (Fletcher, 1978). However, if residential housing has potential to be impacted, the affected environment includes the distance from the source of the noise to the residence.

Noise impacts were assessed in a five-mile radius around all mine activities. There were no identified sensitive receptors within a five-mile radius of the mine; with the exception of the Tumbling TR Ranch, which is the Barrick-owned ranch located to the southwest of the mine site. A property was considered a sensitive receptor if impacts to these sites could effect existing (or formerly and definitive planned) populations or areas especially sensitive to those impacts.

Indicators

The unit of sound level measurement (i.e., volume) is the decibel, expressed as A-weighted decibel. The A-weighted decibel measure is used to evaluate ambient noise levels and common noise sources. Sound measurements in A-weighted decibels give greater emphasis to sound at the mid- and high-frequency levels, which are more discernible to humans. The decibel is a logarithmic measurement; thus, the sound energy increases by a factor of 10 for every 10 A-weighted decibel increase. A three A-weighted decibel change in noise level is considered barely perceptible, while a five A-weighted decibel change is typically perceptible to most people.

The primary indicator of noise levels for this and similar analyses is the A-weighted average noise level measured in decibels. The one-hour average noise level (A-weighted decibel Leq (one hour)) is often used to characterize ongoing operations or longer-term impact analyses. The maximum A-weighted decibel level (Lmax) is used to document the highest intensity, short-term noise level. Routine noise levels over 50 A-weighted decibels Leq or over 70 A-weighted decibels with some regularity would be considered a moderate impact. Regular public exposure to noise levels over 70 A-weighted decibels would be considered a major impact. Maximum public exposure below moderate levels defined would be considered a minor impact.

Affected Environment

The primary natural source of noise currently observed in the Proposed Action area is wind. Noise from the existing BMM operations is added to the natural sources in the baseline condition of the Proposed Action area. There are few receptors within audible range of the existing mine. Intermittent blasting can be heard, mostly faintly, at only a few receptors representing human residences or activity. Transportation impacts, primarily along the access routes, currently have light impacts on the few ranches scattered along the routes. Existing natural noise levels are generally low intensity away from traffic corridors, estimated to average between 30 and 35 A-weighted decibels. Traffic impacts contribute slightly higher background noise levels. The only human activity within the direct impact area close to the traffic corridor is a ranch, which is owned by Barrick and used for renting space to mine contractors. Existing conditions include the current level of activity at and supporting the BMM.

Mine Site

Most of the equipment on-site at the BMM generates sound levels at or below 90 A-weighted decibels Leq at 50 feet. Table 3-28 estimates noise levels at 50 feet generated by intermittent activity at the mine.

Noise levels drop off progressively with distance from the source. There are few sensitive receptors in the vicinity. The nearest residence or areas of human activity are ranches in the valleys, which are at least five miles away from the mine boundary. Current mine activities have only minor noise impacts on any off-site human receptors because the distances to the nearest occupied areas are sufficient to attenuate the noise of the heavy equipment to near background levels. Intermittent blasting can be audible but is at low enough volume and frequency to be considered minor. The mine site is mostly above surrounding terrain, limiting the potential for noise reflection or concentration by terrain. According to BMM staff, no complaints from surrounding land users for excessive noise have been received (Zietlow, 2007d).

TABLE 3-28 HIGHER VOLUME CONSTRUCTION EQUIPMENT NOISE SOURCES

NOISE SOURCE	MEAN NOISE LEVEL AT 50' (A-WEIGHTED DECIBELS)	MAXIMUM NOISE LEVEL AT 50' (A-WEIGHTED DECIBELS)
Haul Truck	90	84
Pile Driver	95	101
Blasting	94	N/A
Earth Scraper	90	84
Front End Loader	90	96 (within 15')
Blast Hole Drill	85	N/A
Exploration Drill	85	N/A

Source: Federal Highway Administration Construction Noise Handbook (2006).

Access Road Corridors

Current activity levels include bus and limited private vehicle traffic transporting staff to and from the mine site and trucks bringing mine supplies. The approaching stretches of access roads are gravel surfaced, which tends to reduce vehicle speeds and associated noise. There are two ranches within one mile of the road to Jiggs (about 25 miles north of the mine and outside the area of analysis) and another ranch on State Route 892 that is owned by Barrick and is used to house mine contractors. Therefore, noise levels from traffic to and from the mine are short in duration and minor in magnitude.

3.16.2 Noise and Vibration Environmental Consequences

Potential sources of noise and vibration include earth moving, blasting, drilling, and increased traffic, as described below.

Indicators

Neither the State of Nevada nor White Pine County have regulations quantitatively limiting noise generation or impacts from the proposed project during the construction or operational phases. For this analysis, the U.S. Environmental Protection Agency guideline recommends that noise levels above 55 A-weighted decibels day-night sound level at residential land use be used as a guide for assessing impacts at the nearest home, ranch, business, or identified receptor.

Proposed Action

Mine Site

Expanded mine activities would closely resemble the historic and ongoing activities at the mine, which feature significant earth-moving activity. The noise profile from construction activities is expected to be little different from the existing noise profile. There might be more noise generated on site if new equipment was brought in to prepare for expanded operations. Even with that additional equipment, construction noise other than blasting would be attenuated down to background levels by the distance to the nearest human receptors.

Noise from project activity during the operational phase would primarily be generated by site equipment, blasting, drilling, and traffic to and from the site. The Proposed Action could result in slightly increased activity at the mine. The overall mine noise generation profile would be minimally changed compared with current activities on site because there is expected to be little change in the activities that generate the most noise, including blasting. Therefore, the noise profile described under existing conditions would also be representative of noise generation anticipated. The locations of the noise-generating activities would change slightly, but those changes would be expected to be unnoticeable or minor at all off-site receptors.

One of the closest private properties to the Proposed Action is located at NE ¼ NE ¼ Section 5, T23, R58, Lot #1. This property is currently undeveloped and unoccupied. The background noise levels in regional rural locations such as that surrounding the Proposed Action, are driven by natural conditions and are normally 35 A-weighted decibels or less, away from local sources such as roads. This property is located east of the BMM mine property. BMM operations on the southeast side of the mine, both existing and proposed, include the Mooney Heap Leach Pad, the Sage, Belmont, and Bida pits and associated rock disposal areas. The existing BMM Mooney Heap Leach Pad is approximately 7,500 feet northwest of the property. The Proposed Action would expand the leach pad to within 4,800 feet west-northwest of the property. The existing BMM Sage, Bida, and Belmont pits and their associated rock disposal areas are approximately 7,000 feet from the private property to the west-northwest and west-southwest. The Proposed Action would bring the nearest mine pit activity 8,400 feet west-southwest of the private property, and the nearest rock disposal areas activity 5,000 west-southwest of that property. No other BMM existing or proposed operations occur within two miles of the referenced property.

The BMM Mooney Basin operations are located in the south-southwest to north-northeast trending Mooney Basin. Noise travels by line of sight and is stopped or significantly buffered by intervening terrain. The ridges on each side of the Mooney Basin effectively block transmission of noise to the referenced private property. The Maverick Spring Ridge is located between the BMM operations and the property. The property is well below the ridge line and the Maverick Spring Ridge to the west blocks the majority of the historic Mooney Basin and BMM activities. BMM activities that are visible are associated with the small Belmont pits on the west side of the basin. All other historic BMM activity would have terrain between operational areas and the private property that would buffer and minimize noise transmission.

The only new BMM activity with the implementation of the Proposed Action without intervening terrain toward the referenced private property would be small sections of the far southern end of the expanded Mooney Heap Leach Pad.

Analytical assessments of noise generated by the Proposed Action in the vicinity of the eastern BMM property boundary were prepared using conservative assumptions of noise generated and regional and local environmental attenuation. Those quantitative analyses showed noise impacts from currently permitted on-site BMM operations are estimated to have a maximum 15 minute average of approximately 51 A-weighted decibels, and to have an instantaneous peak near 62 A-weighted decibels when blasting occurred near the eastern mine boundary. The average and maximum noise impacts of the Proposed Action would be comparable to those of the existing action. Under the Proposed Action, noise impacts are estimated to have a maximum 15 minute average of approximately 54 A-weighted decibels during the operational phases, and to have an instantaneous peak near 61 A-weighted decibels during blasting. The noise impacts have the potential to be three to four A-weighted decibels higher during the brief construction period associated with the Proposed Action. Higher equipment usage rates will result in a maximum 15 minute average of approximately 58 A-weighted decibels during the brief construction phase. Operations may have an instantaneous peak near 64 A-weighted decibels if blasting and the construction phase occurred simultaneously.

Under the Proposed Action, the increase in maximum short-term average noise is predicted to be approximately four A-weighted decibels, just barely above the three A-weighted decibels threshold of human perception. The maximum increase in noise levels when blasting would be below the human perception threshold. The predicted maximum noise levels are below the 50 A-weighted decibels routine and 70 A-weighted decibels instantaneous thresholds for moderate impact.

Access Road Corridors

The Proposed Action would result in a slight increase in commuter traffic to and from the mine site. One bus would likely be added to the current fleet of two buses to transport staff to and from communities to the north and south. There should be little change in individual commuter vehicles because personal vehicle travel to the site is discouraged and, because of the cost, employees rarely use personal vehicles unless they miss the bus or van. Supply vehicle traffic could potentially increase by 10 to 15 percent. Direct impacts of these slight increases in traffic along access roads would be minor. As noted previously, there are no occupied residences or businesses near either access road within 10 miles of the mine, other than the Barrick-owned ranch.

Direct impacts include regional traffic to and from the facility. Indirect impacts could include increased traffic, noise, and general activity in the vicinity, primarily in communities along U.S. Highway 50 to the south of Jiggs and communities to the north, associated with increased levels of support services and employment. Those effects are expected to be minor, as the Proposed

Action would represent a maximum staffing increase of approximately 110 individuals. Increased noise from traffic would also be expected along the Long Valley Road. BMM uses Long Valley Road for deliveries of equipment and materials to the Mooney Basin area. Historic traffic volumes are understood to be light, resulting in raising the maximum sustained noise levels on the property to between 35 and 40 A-weighted decibels, with higher instantaneous noise levels with the passage of vehicles. The Proposed Action would not be expected to result in any road improvements that would not have otherwise occurred, and would not be expected to affect any traffic on Long Valley Road other than mine-bound traffic. The proposed 10 to 15 percent increase in the historically light traffic would be expected to result in sustained noise impacts that were insignificant and probably below the threshold of human perception. Instantaneous impacts at the same elevated levels would be slightly more frequent, but would only lead to perceptible changes in sustained noise during periods of concentrated traffic during construction or the initial operational phases.

Therefore, the effect of the Proposed Action would be little or no increase in humanly perceptible noise compared to current or historic noise levels.

Alternative A – Partial Backfill Alternative
Direct and indirect impacts from project activity noise would be the same as those that would occur under the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Direct and indirect impacts from project activity noise would be the same as those that would occur under the Proposed Action.

No Action Alternative
The No Action Alternative would result in no change to existing noise levels at the mine until operations terminate. The lack of operational noise from the mine after reclamation was concluded would not be noticeable to the nearest residents, though those along the access roads would notice the lighter mine traffic and associated cessation of intermittent road noise. Indirect impacts could result in less noise in surrounding communities associated with fewer employees and likely a population decrease.

3.17 Socioeconomics

This section describes existing socioeconomic conditions and identifies potential effects of the Proposed Action and alternatives.

3.17.1 Socioeconomics Affected Environment

The analysis area for socioeconomic impacts comprises White Pine, Elko, and Eureka counties, all of which are predominantly rural and without large urban centers. Mining has been a major economic force in the area since the arrival of the first settlers in the mid-1800s. Even today, the economies of White Pine, Elko, and Eureka counties tend to follow the cycles of hard rock mining activity. In recent times, the area's scenic beauty, wildlife, and public lands have attracted increasing numbers of tourists and second-home owners. An economic profile of the three counties is presented in Table 3-29.

Elko County is the largest of the three counties in land area, and it also has the largest population and the most diversified economy. The largest employers in the county include state and local government, casino-hotels, retail outlets, a regional hospital, and mining companies (NDETR, 2007). Elko is the largest town in Elko County with a population of approximately

17,000, or about 33 percent of the County's total population (City of Elko, 2007). The town of Elko is on Interstate Highway 80, approximately 65 miles north of the BMM.

TABLE 3-29 COUNTY ECONOMIC PROFILES

	ELKO	EUREKA	WHITE PINE
Land Area[1] (square miles)	17,179	4,176	8,876
Population[1]			
2000	45,291	1,651	9,181
2006 est.	47,114	1,480	9,150
Employment[2]			
Civilian Labor Force (Oct. 2007)	26,744	784	4,718
Percent Unemployed (Oct. 2007)	3.3%	5.5%	4.2%
Housing[1]			
Housing Units (2005)	19,066	1,064	4,451
Percent Home Ownership (2000)	69.9%	73.7%	76.6%
Building Permits (2005)	198	0	20
Taxable Retail Sales[3] (2004, millions)	$805	$173	$102
Income[1]			
Median Household Income (2004)	$52,202	$42,790	$39,420
Per Capita Income (1999)	$18,482	$18,629	$18,309
Percent Below Poverty Level (2004)	8.7%	9.0%	12.4%
Average Wage (FY 2007)[4]	$15.49	$31.70	$16.35

[1] U.S. Census Bureau, 2007a.
[2] FRBSL, 2007.
[3] NDETR, 2007.
[4] EDAWN, 2007.

Elko County has seven elementary schools, two middle schools, three high schools, four combined schools, and several rural schools. Great Basin College is located in Elko. The City of Elko is served by Sierra Pacific Power Company; the cities of Carlin, Wells, and West Wendover are served by Wells Rural Electric Company. Law enforcement, fire protection, ambulance, and emergency medical services are provided by the County. County-provided services are generally adequate to serve the existing population (Johnson, 2008). The more rural areas tend to have longer response times for emergency services because of the County's large area of service.

Temporary housing is currently in fairly short supply in Elko, but there is an adequate supply of homes on the market and the supply of housing continues to expand (Aguirre, 2007).

The Elko County budget (NDT, 2007a) for the fiscal year ending June 30, 2007, listed total revenues of $29,784,245, the largest components of which were Intergovernmental Resources (54 percent) and property taxes (27 percent). The Intergovernmental Resources category includes such items as state and federal grants and state shared revenue.

Over the last 10 years, the unemployment rate in Elko County has averaged 4.4 percent, reaching a high of 7.6 percent in 1998 and a low of 3.0 percent in 2005 and 2006 (FRBSL, 2007).

The population of Eureka County is approximately 1,500, with most residents living in the unincorporated town of Eureka, which is on U.S. Highway 50, approximately 60 miles by road southwest of the BMM. The largest employers in Eureka County are mining companies, followed by local government, hotels, construction companies, and retail outlets (NDETR, 2007). The average wage in the county (Table 3-29) is higher than any other county in Nevada because of the large proportion of workers in well-paying jobs in the mining industry. The Eureka County budget (NDT, 2007a) for fiscal year ending June 30, 2007, listed total revenues of $11,371,543, the largest components of which were Intergovernmental Resources (44 percent) and property taxes (47 percent).

Eureka County is served by three electric utilities; the central and southern portions of the county, including the town of Eureka, are served by Mt. Wheeler Power. The Eureka Town Water System supplies water to the town of Eureka; the County operates a landfill on the west side of Eureka and a transfer station near Crescent Valley. The County operates one high school and two elementary schools. The County funds volunteer fire departments in Eureka, Crescent Valley, Beowawe, and Pine Valley.

Housing in the town of Eureka is currently limited because of increased mining activity. There is virtually no temporary housing available, and few homes are on the market (Mears, 2007). The Archimedes expansion of the Ruby Hill Mine is currently underway, and the shortage of housing is expected to become severe as the Mt. Hope Mine prepares to start operations within the next several years. To help meet the current and future housing demand, the County is considering leasing two properties it owns for development of residential and commercial facilities (Evans, 2007).

Over the last 10 years, the unemployment rate in Eureka County has averaged 4.4 percent, reaching a high of 8.7 percent in 2003 and a low of 2.2 percent in 2005 (FRBSL, 2007).

Ely, which is located on U.S. Highway 50 approximately 62 miles southeast of the BMM, is the largest town in White Pine County with a population of approximately 4,166 in 2005 (NDT, 2007a), or about 46 percent of the total County population. The number of County residents living in an institutional setting is notable. The Ely State Prison, which is located approximately 10 miles northwest of Ely, has a design capacity of 784, an operating capacity of 969, and an emergency capacity of 1,008 (NDC, 2007). The Ely Conservation Camp, south of Ely, has a capacity of 150. The largest employers in the County include mining companies, casino-hotels, retail outlets, and federal, state, and local government. The White Pine County budget (NDT, 2007a) for the fiscal year ending June 30, 2007, listed total revenues of $13,018,486, the largest components of which were Intergovernmental Resources (51 percent), property taxes (16 percent), and other taxes (real property transfer tax and sales tax, 19 percent).

White Pine County has four elementary schools, one middle school, and two high schools. Electricity is provided by Mt. Wheeler Power, a rural electric cooperative. Water and sewer service is provided by the Ely Municipal Water Department, McGill-Ruth Sewer and Water District, and Baker Water and Sewer General Improvement District. The Ely Volunteer Fire Department provides fire protection for the entire County, supplementing volunteer fire services in Ruth, McGill, Lund, and Baker. The White Pine County Sheriff's Department provides law enforcement services in the County. In recent years the County has had difficulty providing services because of declining revenue; however, the current demand for County services is being adequately met (Sprouse, 2008).

Temporary housing is currently in short supply and rents are increasing in Ely. The number of homes currently on the market is considered normal turnover, not a shortage or oversupply (Almberg, 2007).

During the last 10-year period the unemployment rate in White Pine County has averaged 4.3 percent, reaching a high of 9.2 percent in 1998 and a low of 2.9 percent in 1998 and 1999 (FRBSL, 2007)

An important part of the income of White Pine County and other predominantly rural counties in Nevada is produced by the net proceeds tax on mining activity within the county. The net proceeds tax is actually a property tax on minerals that originated because mines were unable to accurately estimate the value of ore deposits until the minerals were extracted. Ore deposits vary in size and richness, and valuation constantly changes in response to market fluctuation. The net proceeds tax is based on the value of the minerals extracted after deductions such as the costs of extraction, processing, transportation, and marketing. The tax is collected by the state, and a portion is returned to the county in which the mine is located. The net proceeds tax revenue is distributed by the counties in the same way as property taxes, that is, for schools and other government services (Nevada Taxpayers Association, 2007).

Table 3-30 presents state and county taxes due on net proceeds of minerals for the three most recent years for which data are available. It should be noted that the BMM had net proceeds of zero and therefore paid no net proceeds taxes in 2004 and 2005 (NDT, 2005b; NDT, 2006b).

The Robinson Copper Mine was a major force in the economy of White Pine County from the early 1900s until 1978, when Kennecott Copper closed the mine. The mine was sold to Magma Copper and later to Broken Hill Properties of Australia. The mine then operated from 1996 to 1999, when it became inactive for about five years. Each cycle of mine expansion and closure or inactivity rippled through the County's economy and labor force. The mine was purchased by Quadra Mining Company and went back into full operation in July 2004 (White Pine County, 2006).

TABLE 3-30 TAXES DUE ON NET PROCEEDS OF MINERALS

CALENDAR YEAR	2005	2006	2007
Elko County Tax Due	$1,725,706	$1,624,011	$2,451,408
Eureka County Tax Due	$4,777,576	$10,040,177	$8,102,780
White Pine County Tax Due	$1,344,830	$8,341,976	$8,881,793
Total Tax Due for All Nevada Counties	$22,424,616	$37,441,967	$32,621,781
Total State Tax Due	$19,381,298	$38,252,414	$29,972,916

Sources: NDT, 2006b; NDT, 2007b, NDT, 2008.

White Pine County was in such financial difficulty in 2005 that the local government was faced with insolvency (NDT, 2005a). The State Tax Commission voted in 2005 to declare a severe financial emergency in the County, which had overspent its budget despite more than $1 million in spending cuts. Emergency measures were taken in early 2006 that included increasing the Government Services Tax from 1 percent to 2 percent of the value of vehicles being registered, increasing the sales and use tax rate by 0.25 percent, increasing property taxes from $3.66 to $4.5 per $100 of assessed value, and increasing the transient lodging tax from 11 to 12 percent (NDT, 2006a). These measures started the process of returning the County to financial stability, but another important factor was a resurgence of mining activity (Las Vegas Review-Journal, 2007). The County received about $9 million in net proceeds funds because of renewed activity in the Robinson Mining District. The Nevada Department of Taxation is now working on a transition plan to move the County from emergency status to a level of technical assistance.

The IMPLAN input-output model (Minnesota IMPLAN Group, 2004) was used to estimate the existing economic impact of the BMM as well as potential economic impacts from the Proposed Action and alternatives discussed below. The model was run by Professor Thomas R. Harris of the University of Nevada, Reno, Department of Resource Economics, University Center for Economic Development. Model outputs were provided in tabular form.

Economic data for the three counties in the analysis area were combined for the IMPLAN model runs. The current level of employment and labor income for the 10 largest sectors (by employment) of the analysis area economy are presented in Table 3-31 for the most current data available (Minnesota IMPLAN Group, 2006).

TABLE 3-31 LARGEST ECONOMIC SECTORS IN ANALYSIS AREA

ECONOMIC SECTORS	EMPLOYMENT	EMPLOYMENT (PERCENT)	LABOR INCOME (MILLIONS)	LABOR INCOME (PERCENT)
Gold, silver, and other metal mining	6,202	18.6	$550	33.9
Accommodation and food services	6,152	18.4	$169	10.4
Government and non-North American Industry Classification System	5,511	16.5	$318	19.6
Retail trade	2,930	8.8	$78	4.8
Construction	1,827	5.5	$90	5.5
Other mining	1,642	4.5	$98	6.0
Health and social services	1,493	4.5	$53	3.3
Other services	1,293	3.1	$33	2.0
Agriculture, forestry, hunting and fishing	1,045	3.1	$13	0.8
Wholesale trade	849	2.5	$51	3.1
Remaining sectors	4,469	13.4	$171	10.6
Total	**33,413**	**100**	**$1,624**	**100.0**

Source: IMPLAN data, 2006.

The IMPLAN model indicates that employment of the 215 workers at the BMM supports an additional 64 indirect and 98 induced jobs in the three-county area (indirect and induced jobs include full-time, part-time, and intermittent jobs). The 2006 total labor income effect of the BMM is estimated at $19.4 million plus an additional $3.6 million in indirect labor income and $3.1 million in induced labor income. While IMPLAN model results are helpful in quantifying economic effects, consideration must be given to the inherent limitations of input-output models and their underlying assumptions, as discussed in product literature (Minnesota IMPLAN Group, 2004).

The BMM employees live in one of three general areas (Zietlow, 2007a): Elko-Spring Creek (64 percent), Ely (22 percent), and Eureka (14 percent). Employees are transported to the mine from Elko, Ely, and Eureka in mine-operated buses or vans. Personal vehicle travel to the site is discouraged and, because of the cost, employees rarely use personal vehicles unless they miss the bus or van. In 2007, the BMM payroll was approximately $23.1 million. Of this total, an estimated $14,784,000 is paid to residents of Elko County, $5,082,000 is paid to residents of White Pine County, and $3,234,000 is paid to residents of Eureka County. The 2007 average cost with benefits per employee at the BMM is $107,000, well above the median household income and per capita income in the three counties. Because mining activity in the analysis area has been expanding in response to recent increases in metals prices, a shortage of skilled employees is developing and wages for skilled workers are likely to continue to increase.

Purchases of materials and services for mine operations in 2007 totaled approximately $23,000. A portion of this total would generate sales tax revenue for the state and counties, depending on the actual location of the sales.

Gold production at BMM increased gradually from approximately 50,000 ounces per year in 1987 to a peak of about 175,000 ounces per year in 2002. Production then declined to below 50,000 ounces per year in 2004, when the trend strongly reversed, and production climbed to over 250,000 ounces per year in 2006. Production returned to a historically normal level of 115,000 ounces in 2007.

3.17.2 Socioeconomics Environmental Consequences

Proposed Action

Anticipated socioeconomic impacts include changes in employment; personal, state, and local income; and demand for housing and services such as utilities, schools, safety, and fire protection. Anticipated impacts are described more fully below.

The staffing level at the mine is expected to increase under the Proposed Action to a maximum of about 325 employees, an increase of about 50 percent over current employment. Table 3-32 shows projected levels of staffing, gold production, and tax payments for the operating life of the mine. It must be recognized that these projections are tentative and subject to revision based on the market price of gold, the ability to find qualified employees, and other economic factors outside the mine's control.

White Pine County would be the recipient of the mine's ad valorem tax payments and would receive a share of the net proceeds tax paid to the state because the mine is located entirely within the County. This additional source of reliable income would help White Pine County stabilize its finances. All three counties would benefit from local spending by residents who are employed at the mine.

The IMPLAN model indicates that an increase of 110 employees at the BMM would be expected to support an additional 33 indirect and 50 induced jobs in the three-county analysis area. Most of these jobs would be in the gold, silver, and other metal mining sector, with much smaller contributions to retail trade, accommodation and food services, wholesale trade, health and social services, and other sectors of the economy. The IMPLAN model estimates that at maximum capacity, the value of direct, indirect, and induced annual labor income from the Proposed Action would be $9.9 million in 2006 dollars.

Exact population impacts cannot be determined because some positions are likely to be filled by current residents of the three counties while others would be filled from outside the analysis area. If all 110 new employees of the mine were from outside the analysis area, the population could increase by approximately 330 persons. This estimate uses an average family size of three, based on the number of persons per household in the analysis area provided by the U.S Census Bureau (2007a).

If the supply of housing was not a factor, the new employees would likely be distributed among Ely, Elko, and Eureka in approximately the same proportion as the mine's current employees. However, few new employees are likely to find housing in Eureka because of the current shortage, and the current supply of housing in Ely would probably be depleted quickly. In the long run, it is likely that the supply of housing in Eureka and Ely would expand to meet the increased demand. However, until that happens, the great majority of new employees would probably find housing in the Elko area. Some current residents of Eureka and Ely might find

TABLE 3-32 PROPOSED ACTION AND ACTION ALTERNATIVES – ESTIMATED MINE STAFFING, PRODUCTION, AND TAXES

Year	07	18	69	10	17	12	13	14	15	16	17	15	15	20	24	22	23	24	25
Employees	215	205	280	200	325	325	325	300	260	210	160	190	60	25	15	6	4	4	1
Payroll ($ millions)	23.1	22.0	30.7	30.9	30.9	35.0	30.9	31.4	28.6	23.0	17.8	11.8	7.7	3.4	2.0	0.5	0.5	0.5	0.1
Gold Production (ounces per year thousands)	120	110	98	105	105	245	242	270	190	130	105	90	90	10	-	-	-	-	-
White Pine County Ad Valorem Tax ($ thousands)	560	720	980	1,020	1,000	1,150	1,080	1,010	875	720	410	150	100	25	15	15	10	10	5
Net Proceeds Tax ($ thousands)	190	160	-	-	-	1,400	1,200	1,500	550	300	200	190	50	20	-	-	-	-	1

Note: Dollar amounts are in 2007 dollars.

better paying jobs at the mine, increasing the income of residents and the counties with little adverse effect on county services.

In the event that most new employees (110) came from outside the area to live in the Elko vicinity, the effect on the supply of housing and county infrastructure would be manageable. This increase would represent only 0.4 percent of the current Elko County civilian labor force. The existing level of county public services such as schools, utilities, fire protection, and law enforcement should be adequate to serve the new employees.

Alternative A – Partial Backfill Alternative
Socioeconomic effects of the proposed project under this alternative would be essentially the same as with the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative
Socioeconomic effects of the proposed project under this alternative would be essentially the same as with the Proposed Action.

No Action Alternative
Under this alternative, mine operation would continue under the existing Plan of Operations. The number of employees would begin to decline immediately, and by 2012 production and net proceeds tax payments would end (Table 3-33). Tax revenues received by the three counties would be reduced, as would the demand by mine employees for housing, schools, fire and police protection, and utilities. However, because of the current expansion in mining activity in the analysis area, the impact on county employment, income, and infrastructure would be less than would occur under sluggish economic conditions. Many of the current BMM employees would be likely to find work at other mines in the analysis area.

TABLE 3-33 NO ACTION ALTERNATIVE – ESTIMATED MINE STAFFING, PRODUCTION, AND TAXES

Year	07	08	09	10	11	12	13	14	15	16
Employees	215	185	110	60	25	15	6	4	4	1
Payroll ($ millions)	23.1	19.9	12.5	7.7	3.4	2.0	0.8	0.5	0.5	0.1
Gold Production (ounces per year thousands)	120	110	70	70	10	-	-	-	-	-
White Pine County Ad Valorem Tax ($ thousands)	560	650	400	100	25	15	15	10	10	5
Net Proceeds Tax ($ thousands)	190	250	150	50	20	-	-	-	-	-

Note: Dollar amounts are in 2007 dollars.

3.18 Environmental Justice

On February 11, 1994, President William Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This Executive Order was designed to focus the attention of federal agencies on human health and environmental conditions in minority communities and low-income communities. In an accompanying Presidential memorandum, the President emphasized that existing laws, including NEPA, provide opportunities for federal agencies to address environmental hazards in minority and low-income communities. In April of 1995, the U.S. Environmental Protection Agency released the document titled Environmental Justice Strategy: Executive Order 12898.

The document established U.S. Environmental Protection Agency-wide goals and defined the approaches by which the U.S. Environmental Protection Agency would ensure that disproportionately high and adverse human health or environmental effects on minority communities and low-income communities are identified and addressed.

3.18.1 Environmental Justice Affected Environment

Minority Population

Table 3-34 summarizes the ethnic composition of the counties nearest to the Proposed Action (White Pine, Elko, and Eureka) and of the State of Nevada. In accordance with the U.S. Environmental Protection Agency's Environmental Justice Guidelines (EPA, 1998), these minority populations should be identified when either (1) the minority population of the affected area exceeds 50 percent or (2) the minority population of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Analysis reveals that the ethnic composition of the populations of White Pine, Elko, and Eureka counties is less than 50 percent and is not meaningfully different from that of the State of Nevada (Table 3-34). A second provision requires consideration of "impacts that may affect a cultural, historical, or protected resource of value to an Indian tribe or a minority population, even when the population is not concentrated in the vicinity." Seven Tribal governments, as described in Section 3.20, were contacted to solicit comments and identify any Native American concerns about the project. The BLM also holds regular meetings with local Tribes and discussed the proposed project with the Ely Shoshone Tribe at two meetings in 2007.

Low-Income Population

Analysis of the percentage of persons below the poverty level for the studied counties reveals that the incidence of poverty in White Pine, Elko, and Eureka counties is not meaningfully different from that of the State of Nevada (Table 3-34).

Protection of Children

The Environmental Justice analysis includes a protection of children component to determine if the Proposed Action would place an undue burden on children. Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks (April 27, 1997) recognizes a growing body of scientific knowledge that demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because (1) children's bodily systems are not fully developed, (2) children eat, drink, and breath more in proportion to their body weight, (3) their size and weight may diminish protection from standard safety features, and (4) their behavior patterns may make them more susceptible to accidents. Based on these factors, the Executive Order directed each federal agency to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. The Executive Order also directed each federal agency to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks and safety risks. The number of children in White Pine, Elko, and Eureka counties and the State of Nevada are shown in Table 3-34.

TABLE 3-34 ETHNICITY, CHILDREN, AND INCOME

	Elko	Eureka	White Pine	Nevada
ETHNICITY (PERCENT, 2005)				
White persons	91.4	95.8	90.2	82.0
Black persons	0.9	0.4	4.5	7.7
Native Americans	5.6	1.0	3.5	1.4
Asian	0.9	1.0	1.0	5.7
Pacific Islanders	0.1	0.0	0.1	0.5

	Elko	Eureka	White Pine	Nevada
Hispanic or Latino	21.7[1]	12.7[1]	11.4[1]	23.5[1]
CHILDREN IN POPULATION (PERCENT, 2005)				
Persons under 5 years old	6.7	5.3	4.4	7.2
Persons under 18 years old	29.6	24.3	21.0	25.7
Per-Capita Income (1999)	$18,482	$18,629	$18,309	$21,989
Median Household Income (2004)	$52,202	$42,790	$39,420	$47,231
Persons Below Poverty (percent, 2004)	8.7	9.0	12.4	11.1

Source: U.S. Census Bureau, 2007a.

[1] People who identify their origin as Spanish, Hispanic, or Latino may be of any race. Thus, the percentage Hispanic should not be added to percentages for racial categories. Non-Hispanic White persons are those who responded "No, not Spanish/Hispanic/Latino" and who reported "White" as their only entry in the race question. More complete tallies that show race categories for Hispanics and non-Hispanics separately are also available.

3.18.2 Environmental Justice Environmental Consequences

Proposed Action

The Proposed Action is not expected to have a disproportionate effect on any particular population.

The area in the immediate vicinity of the proposed project is sparsely inhabited with scattered ranches being the only residences. The nearest residential area is the town of Eureka, which is approximately 60 road miles southwest of the Proposed Action area. Eureka does not have an unusually high minority or low-income population. Environmental effects that may occur at a greater distance, such as noise or air impacts, would affect the area's population equally, without regard to ethnicity or income level.

According to Section 3.20 of this FEIS, no traditional cultural properties or Executive Order 13007 (Executive Order on the Indian Sacred Sites) sites have been identified within the Proposed Action area that might be impacted by the Proposed Action or any of the alternatives. To date, no specific concerns about the proposed project have been raised by Native American Tribes. Therefore, there are no impacts associated with the Proposed Action on traditional Native American concerns.

The Proposed Action would not result in a disproportionate effect on a minority population. The Proposed Action is unlikely to place an undue burden on children because the area is remote and few, if any, children live or have reason to congregate in the vicinity. Because there is no disproportionate effect on an identified minority population or children as a result of the Proposed Action, no further environmental justice analyses are required.

Alternative A – Partial Backfill Alternative

Because no disproportionate effect on an identified minority population or children has been identified, no further environmental justice analyses are required for this alternative.

Alternative B – Mooney Basin Heap Leach Pad Alternative

Because no disproportionate effect on an identified minority population or children has been identified, no further environmental justice analyses are required for this alternative.

No Action Alternative

Because there is no disproportionate effect on an identified minority population or children from current operations, no further environmental justice analyses are required for the No Action Alternative.

3.19 Cultural Resources

The Bald Mountain Mining District has been the focus of industrial mining activity since 1906. However, modern cultural resource management practices began only when up-to-date mining operations were initiated in the mid 1980s at the Top Pit. The regulatory framework applied to cultural resources within the district consists of the Antiquities Act of 1906 (PL 59-209), the Archaeological Resources Protection Act of 1979 (PL 96-95), and the National Historic Preservation Act of 1966, as amended in 1992 (16 USC 470). Section 106 of the National Historic Preservation Act (36 Code of Federal Regulations Part 800) requires that federal agencies such as the BLM take into account the effects of their undertakings on properties (sites) eligible for nomination to the National Register of Historic Places. Also, NEPA, as amended (42 USC 4371 et seq.), requires that agencies consider the effects of their actions on cultural resources.

As various mining companies have operated in the Bald Mountain Mining District, the information available regarding archaeology has rapidly expanded. This, in turn, suggests a need for an administrative agreement that would cover modern mining's effect on local archaeology. This need resulted in the creation of a Programmatic Agreement (Appendix J) to help the BMM, the BLM Egan Field Office, and the Nevada State Historic Preservation Office identify, evaluate, and treat these cultural resources when necessary (BLM, 1995a). Next, a local mining district historic context was produced (Kautz et al., 2004) to provide a historic framework accompanied by appropriate research questions intended to guide investigations. Finally, information from 59 project reports and 767 archaeological site records from the mining district was used for a geographic analysis (a GIS-centered database) used to develop a description and interpretation of the archaeology within the Bald Mountain Mining District (Kautz and Simons, 2005).

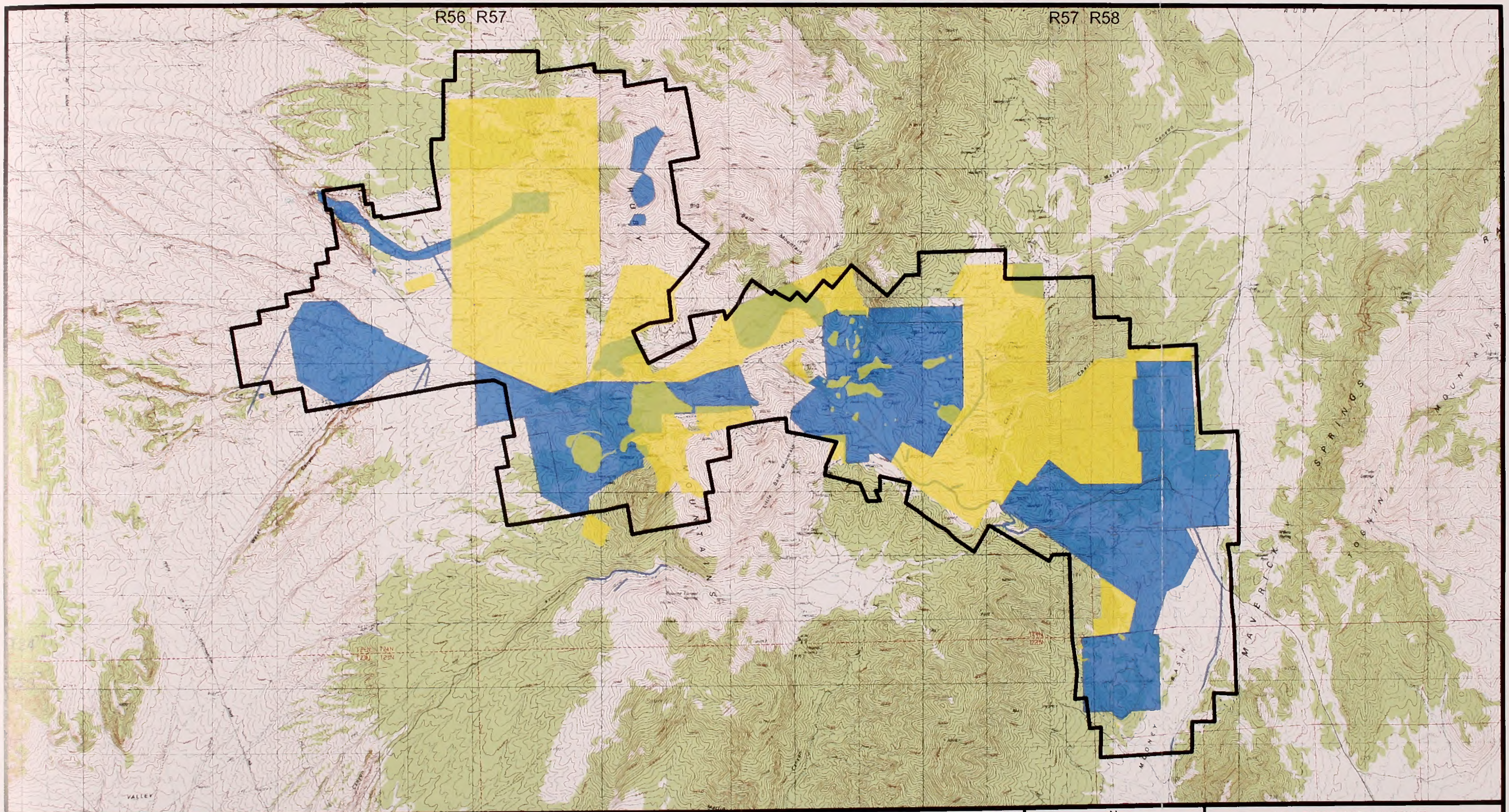
The Proposed Action would disturb 3,920 acres. The location for 100 acres of exploration disturbance has not been identified, leaving a total of 3,820 acres of identified disturbance. Of this, 3,820 acres 503 acres remain to be surveyed for archaeology, 2,198 acres have been surveyed within the last 10 years, and 1,119 acres were surveyed more than 10 years ago. Figure 3-21 shows the locations of cultural surveys within the Proposed Action area. Additionally, 100 acres have been reserved for future exploration activities but the location for such exploration has yet been specifically identified. Surveys over ten years in age should be evaluated for their adequacy in accordance with the existing statewide Protocol Agreement between the Nevada State Historic Preservation Office and the BLM or the existing Programmatic Agreement for the subject undertaking.

Cultural resources that may be affected by the Proposed Action are summarized in Table 3-35, and cultural resource surveys in the proposed Plan of Operations are shown in Figure 3-21.

TABLE 3-35 CULTURAL RESOURCES

	Total Acres	Acres Not Surveyed	Acres Surveyed < 10 yrs	Acres Surveyed > 10 yrs	# Identified Prehistoric Sites*	# Identified Historic Sites*	Total Site Locations
Plan of Operations	16,465	4,095	7,896	4,474	270	109	329
Proposed Action Disturbance	3,920	503	2,198	1,119	95	30	108

*The total number of "site locations" is smaller than the total of "historic" and "prehistoric" sites as it includes as single "sites" localities where there are both historic and prehistoric items.



Legend

- North Operations Project Boundary
- Surveys less than 10 Years Old
- Surveys greater than 10 Years Old

N

0 2,500 5,000 7,500
Feet
1:60,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 3-21
CULTURAL RESOURCES

3.19.1 Prehistoric Resources Affected Environment

The BMM is located in east-central Nevada, a portion of the western Great Basin within a high altitude valley system grading to a steep mountain zone. Humans first occupied this region more than about 5,000 years before the present. The evidence for these earliest people is scant and consists exclusively of the occasional presence of a stone stemmed or northern side-notched spear or atlatl (throwing stick) point. By 5,000 to 3,000 years ago, the human use of this region appears to have intensified only slightly, perhaps due to environmental disruptions characterized by increasing temperatures and reduced rainfall. Such a warming trend would be particularly burdensome in an area with so little surface water. A measure of the area's use can be calculated by dividing the number of projectile points by the number of years each period lasted (Kautz and Simons, 2005). This evidence suggests that during the entire prehistoric period, Bald Mountain usage was similar to occupational intensity patterns elsewhere throughout the western Great Basin (Kelly, 2001; Kelly and Bevill, 2003; Miller and Elston, 1979; Zeier, 1985; Thomas, 1983a, 1988; Thomas and Bettinger, 1976; Wegener and Hintzman, 2004). Accordingly, it appears that sites were quite common between 3,000 and 1,300 years before the present and peaked in number by about 1,300 to 700 years before the present. Finally, the number of sites appears to have dropped off again between 700 and 150 years before the present, by which time contact with Euroamerican culture had changed Native American lifeways significantly.

Elsewhere within eastern Nevada, two customary high altitude economic models have been suggested. One is a "low density intercept strategy hunting pattern" in which low numbers of hunters pursued upland game more than 1,000 years ago (Thomas, 1983b). The other is a much later residential village pattern such as at the seasonally occupied village atop Mount Jefferson in the Toquima Range of northern Nye County (Thomas, 1982). However, neither of these patterns is present within the Bald Mountain uplands. Rather, the Bald Mountain settlement system is dominated by surface stone flake scatters, which comprise 88 percent of all Bald Mountain sites. These are followed by the presence of small lithic quarries where raw stone was acquired, comprising another 6 percent of the total. Not surprising for a mountainous zone, the ratio of flaked stone tools such as points, knives, and so on to the considerably rarer ground stone tools is 99 to 1. This suggests that the bulk of human food-getting behavior was dedicated to the renewal of the prehistoric hunters' tool kits and the acquisition of raw materials, particularly fine-grained, quarried, tool stone. Essentially, the Bald Mountain area appears to have served only as an area occasionally passed through during prehistoric times and not to have been subject to long-term settlement or village life. Instead, larger groups of people were settled in more productive zones such as Huntington Valley, the west side of Newark Valley, and the Ruby Marshes.

This interpretation of limited use is reinforced by analyzing the composition of the flaked stone collections. For example, comparing flake reduction stages with bifacial tool stages at the various sites suggests that throughout prehistory the small quarry sites at Bald Mountain are characterized by cruder tool forms and flakes than are common at the majority of surface lithic scatters. In the lithic scatters, the size and nature of the flakes indicate that final tools like arrowheads were manufactured there, just the opposite of what was found at the quarries. These findings suggest that final tools were finished at the locations commonly referred to as "surface lithic scatters." Though some of the smaller lithic scatters may represent individual hunter's kill sites and/or butchering stations, direct evidence of Bald Mountain hunting such as hunting blinds, deadfalls, equipment caches, rock art, or traps are entirely missing from the Bald Mountain region.

3.19.2 Prehistoric Resources Environmental Consequences

Proposed Action

Anticipated environmental impacts to prehistoric sites include the possibility of disturbance of known and unknown prehistoric sites in the Proposed Action area as described below.

Twenty-six completed cultural resource projects extend into the proposed disturbance area, which is composed of 3,920 acres of disturbance. Of these acres, 1,095 acres have been surveyed over 10 years ago, 2,176 acres have been surveyed within the last 10 years, and 503 acres have not been surveyed yet.

These 26 cultural resource projects have resulted in the discovery and evaluation of 94 prehistoric archaeological sites. Of these, 16 (21 percent) also contain historic-aged artifacts. Seven of these sites have been deemed eligible for nomination to the National Register of Historic Places, all of which are complex flake and stone tool scatters that may contain buried artifacts. Three sites have already been mitigated, and four small sites have not been relocated. Fifteen prehistoric sites remain unevaluated, and the remaining 64 sites have been determined not eligible for nomination to the National Register. Any areas that have not yet had an archaeological survey would be surveyed prior to any project impacts, and all eligible sites that may be impacted by the Proposed Action would be treated as specified in the Programmatic Agreement (Appendix J). Direct impacts to prehistoric resources would be avoided or minimized by implementing the Design Features listed in Table 2-13, and the BLM Best Management Practices as discussed in Appendix D.

Alternative A - Backfill Alternative

The reduction of disturbed areas with this alternative is 434 acres. The total number of prehistoric sites present within this alternative footprint has been reduced by three non-eligible sites (one of these also contains historic materials). No other changes would result should this alternative be chosen.

Alternative B - Mooney Basin Heap Leach Pad Alternative

The reduction of disturbed areas with this alternative is 105 acres, which would reduce the number of impacted prehistoric sites by three: two non-eligible sites and one site that remains unevaluated as to its National Register status. All three sites have been described and evaluated within the last 10 years.

No Action Alternative

This alternative would have no effect on cultural resources other than those described in previous NEPA documents.

3.19.3 Historic Resources Affected Environment

The historic context for the Bald Mountain Mining District (Kautz et al., 2004) includes six themes that address research needs in the local area: Native Americans in the ethnographic present, exploration and emigration, the military, transportation and communication, mining, and ranching and agriculture. However, it has become apparent that Bald Mountain historic sites are almost entirely devoted to the theme of mining (Kautz and Simons, 2005). It follows that the historic roads encountered within the district owe their origin and maintenance to mining activities. The common roadside can scatters are almost entirely a consequence of the activities of miners. Features normally associated with ranching such as local corrals and fence lines are there to accommodate the animals used in mining or mineral exploration, while local domestic cabins are all dedicated to use by local miners (Kautz and Simons, 2005).

Mining in the district began slowly during the late 19th century with limited placer mining by Chinese immigrants near Water Canyon followed by the establishment of three mines on Little Bald Mountain and on a pass between Water and Cherry canyons during the early 1880s (Hill, 1916). However, Paher (1970) suggests that only one mine produced during the remainder of the century. The only documented community in the mining district was the small and dispersed locality of Joy, probably begun about 1875 (Hall, 1994) and expanded as the mining district prospered.

Mining expanded once again during the 1905 to 1907 period, during which capitalized mining commenced, numerous claims were filed, and interest was displayed by outside investors such as Nevada capitalist George Wingfield. In 1907, the Copper Basin Mining and Smelting Company shipped 50,000 pounds of ore by rail to Salt Lake City, though company ownership had changed as a result of the "panic of 1907." Joy became a company town during this early mining period with a continuous population of between 50 and 75 persons. A small, seasonally occupied mining campsite that was misnamed "Bald City" was excavated by Kimball in 2004 with the result that two occupations, dating to 1905-1918 and 1928-1942, were identified. The site consisted of the Copper Basin Mining and Smelting Company's sawmill and several small trash scatters, privies, and tent flats.

Between 1939 and 1942, the Pioneer Copper Mine was the active mining property within the district; it was owned by operators living in Ely. Placer Amex acquired an option on claims in the Bald Mountain Mining District in 1976, with subsequent discoveries in the late 1970s and 1980s, but actual mining operations did not really begin until the mid 1980s at the Top Pit. Other operators worked various areas in the district including Alligator Ridge, Casino/Winrock, Little Bald Mountain Mines, and the Yankee Mine. All these were purchased by Placer Dome U.S. in 1993. Instead of placer or shaft type mining, open pits are used today, together with in-house reclamation programs that are often concurrent with mining operations. Finally, Placer Dome was acquired by Barrick Gold Corporation in April 2006.

Twenty-nine historic sites have been located within the Proposed Action Area, of which only one, a historic miner's cabin, is deemed eligible for the National Register. With the exception of a single 1950s hunters' camp, the remaining historic sites all relate to the mining theme.

3.19.4 Historic Resources Environmental Consequences

Proposed Action

Anticipated environmental impacts to historic resources include the possibility of disturbance to known and unknown historic sites in the Proposed Action area, as described below.

There are 29 historic period archaeological sites located within the Proposed Action area, and 16 (55 percent) of these also contain prehistoric materials. Of these historic sites, one—a historic miner's cabin—has been determined eligible for nomination to the National Register. One non-eligible historic site has been destroyed, one non-eligible site has not been relocated, and one historic site has been mitigated. Additionally, one historic site remains unevaluated, leaving 24 non-eligible historic period sites within the Proposed Action area. All eligible historic sites that may be impacted by the Proposed Action would be treated in accordance with the Programmatic Agreement. Direct impacts to historic resources would be avoided or minimized by implementing the Design Features listed in Table 2-13, and the BLM Best Management Practices as discussed in Appendix D.

Visual impacts to the Pony Express Trail as addressed in the visual resource section, are limited, and would be less noticeable following mine reclamation. Color and texture changes would remain indefinitely. A historic period ranch owned by the mine would not be affected by the Proposed Action.

Alternative A - Backfill Alternative
This alternative would result in the reduction of the historic-aged sites affected by the expansion by two non-eligible historic sites (one of these sites also contains prehistoric materials). All have been evaluated less than 10 years ago.

Alternative B - Mooney Basin Heap Leach Pad Alternative
The reduction of disturbance due to the Mooney Basin Leach Heap Pad Alternative would not change the impact to historic sites described above for the Proposed Action.

No Action Alternative
This alternative would have no effects on cultural resources other than those disclosed in previous NEPA documents (BLM, 1995a).

3.20 Native American Religious Concerns

3.20.1 Native American Religious Concerns Affected Environment

Ethnographic resources include sites or areas of concern to Native American groups either for heritage or religious reasons. The BLM followed general procedures and guidance for Native American Consultation as outlined in BLM Manual H-8120-1 (BLM, 2004d). On April 13, 2007, letters soliciting information from Native American Tribes and inviting the Tribes to enter into consultation for the Proposed Project were sent by the BLM to eight Tribal governments: Summit Lake Paiute Tribe, Winnemucca Intertribal Council of Nevada, Moapa Tribal Business Council, Duckwater Shoshone Tribe, Sparks Indian Colony, Ely Shoshone Tribe, and Timbisha Shoshone Tribal Office, and Bishop Fort Independence Paiute Community Council. The BLM regularly holds Native American coordination meetings with local tribes. The BLM discussed the proposed project with the Ely Shoshone Tribe and Duckwater Shoshone Tribe during a Native American coordination meeting on March 22, 2007. Phone contacts were made to the following tribes on April 11, 2007 to discuss the upcoming public scoping meetings: Ely Shoshone Tribe, Wells Band of the Te-Moak Tribe of the Western Shoshone, Elko Band of the Te-Moak Tribe of the Western Shoshone, and the Western Shoshone Defense Project. The Confederated Tribes of the Goshute Indian Reservation was also contacted on May 7, 2007 inviting them to attend the public scoping meeting and express concern. Comments received are located in Appendix C.

According to Section 3.19 of this FEIS and the report *Ely Resource Management Plan/EIS Ethnographic Studies Technical Report General Report* (Woods Cultural Research, LLC., 2003), no traditional cultural properties or Executive Order 13007 (Executive Order on the Indian Sacred Sites) sites have been identified within the Proposed Action area that might be impacted by the Proposed Action or any of the alternatives.

3.20.2 Native American Religious Concerns Environmental Consequences

Proposed Action
No traditional cultural properties or Executive Order 13007 (Executive Order on the Indian Sacred Sites) sites have been identified within the Proposed Action area that might be impacted by the Proposed Action or any of the alternatives. Therefore, no impacts to Native American religious concerns are anticipated from the Proposed Action.

Alternative A – Partial Backfill Alternative
This alternative would have the same effect as the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative
This alternative would have the same effect as the Proposed Action.

No Action Alternative
This alternative would have the same effect on Native American Religious Concerns as the Proposed Action.

3.21 Hazardous and Solid Waste/Hazardous Materials

Assumptions for Analysis
The assumption made for the hazardous and solid waste/hazardous materials analysis is the following:

- The majority of truck transportation is expected to come from the two access routes listed in Section 3.21.1.

3.21.1 Hazardous and Solid Waste/Hazardous Materials Affected Environment

The affected environment for hazardous materials and solid and hazardous waste includes air, water, soil, and biological resources that could be potentially affected by an accidental release during transportation to and from the Proposed Action area and during storage and use on the project site.

A list of primary fuels and reagents is provided in Table 3-36, and the current chemical storage locations are shown in Figure 2-1 and 2-2 for the BMM and Mooney Basin Operations Area. As discussed in Section 2.3.1, there are three access routes to the Proposed Action area. Bulk chemicals would typically be transported to the site on trucks via one of the following access routes:

- State Route 278 from Carlin to Eureka, U.S. Highway 50 from Eureka to the east to State Route 892 (Strawberry Highway) to the BMM operations; or

- From Ely via U.S. Highway 50 to Long Valley Road to the Mooney Basin Operations Area.

Bulk chemicals and supplies are not typically transported from Elko via Highway 228 (Figure 1-1). There are no current restrictions on delivery times, and no restrictions are proposed.

A hazardous substance, as identified by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 is defined in the following statutes:

- Clean Water Act, Sections 307(a) and 311;
- Resource Conservation and Recovery Act, Section 3001;
- Clean Air Act, Section 112; and
- Toxic Substances Control Act, Section 7.

Pursuant to regulations promulgated under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, release of a reportable quantity of a hazardous substance to the environment must be reported within 24 hours to the National Response Center (40 Code of Federal Regulations part 302). Nevada Administrative Code 445A.347 also requires immediate reporting of a release of a reportable quantity of a hazardous substance to the Nevada Division of Emergency Management. The Nevada Division of Environmental Protection's Water Pollution Control Permit program also includes requirements for reporting as soon as possible,

TABLE 3-36 SUMMARY OF PRIMARY FUELS AND REAGENTS

Substance	Average Annual Usage Existing Operations[1]	Average Annual Usage Proposed Operations[1]	Proposed Deliveries Per Year	Proposed Storage Amount	Storage Method	Location of Material	How Material Is Used
Diesel Fuel & Gasoline	3,800,000 gallons	7,500,000 gallons	365	25,000 gallons	Bulk Tank	Fuel Islands	Equipment fuel
Ethylene Glycol	2,500 gallons	4,500 gallons	4	1,500 gallons	Bulk Tank	Truck Shop	Equipment coolant
Methanol	3,500 gallons	5,000 gallons	1	5,000 gallons	Bulk Tank	Fuel Island	Drill lubricant
Propane	210,000 gallons	270,000 gallons	22	15,000 gallons	Bulk Tank	Admin Areas	Heating
Sodium Cyanide	360,000 gallons	550,000 gallons	208	20,000 gallons	Bulk Tank	Process Plants	Metals recovery
Ammonium Nitrate Fuel Oil (ANFO/PRILL)	450,000	750,000	26	25 tons	Bulk Silos	Truck Shop Area	Blasting operations
Sodium Hydroxide (liquid caustic soda)	160,000	200,000	6	5,000 gallons	Bulk Tank	Process Plants	Solution pH control
Calcium Oxide (Pebble Lime)	29,000 tons	41,000 tons	1,460	100 tons	Bulk Silos	Near Leach Pads	Ore pH control
Hydrochloric Acid	20,000	30,000	3	10,000 gallons	Bulk Tank	Process Plants	Process operations

[1] Pounds per year unless otherwise specified.

but no later than 24 hours, to the Nevada Division of Environmental Protection, Bureau of Corrective Actions. The BMM and Mooney Basin Operations Area have existing Spill Contingency Plans and Emergency Response Plans that address response to hazardous material spills (including hazardous waste), notification procedures, and spill cleanup procedures for on- and off-site incidents.

The BMM and Mooney Basin Operations Area have had incidental spills of fuels and hazardous materials during previous mining and mineral exploration activities, which were reported to the appropriate agencies. The reported spills have been mitigated to the satisfaction of the appropriate agencies, and the contaminated materials have been disposed of in accordance with state and federal regulations.

As described in Section 2.3.11, Nevada Division of Environmental Protection, Bureau of Waste Management regulates the hazardous waste program in the State of Nevada as prescribed in Nevada Revised Statutes 400. Hazardous waste management is subject to specific requirements that are dependent upon the amount of hazardous waste produced at a facility in a calendar month. The BMM and Mooney Basin Operations Area are jointly classified as a Small Quantity Generator of hazardous waste as defined by the Resource Conservation and Recovery Act. A Small Quantity Generator generates between 100 and 1,000 kilograms (220 and 2,200 pounds, respectively) of hazardous waste in a month. This generator status is required to adhere to specific on-site management, transportation, record keeping, and reporting requirements. For disposal of hazardous materials, the BMM and Mooney Basin Operations Area temporarily store hazardous wastes and then transport them to an off-site Resource Conservation and Recovery Act program-approved recycler or treatment and disposal facility. All hazardous wastes are currently stored, packaged, and manifested in compliance with all applicable state and federal regulations.

Non-hazardous, solid waste is currently managed on-site in a Class III waivered landfill as discussed in Section 2.3.11. This facility is constructed and managed in accordance with all applicable state regulatory requirements. A new Class III waivered landfill would also be constructed on a portion of the Saga rock disposal facility. The location of the facility is shown on Figure 2-6.

3.21.2 Hazardous and Solid Waste/Hazardous Materials Environmental Consequences

Proposed Action

Anticipated environmental impacts from hazardous and solid waste and hazardous materials include the possibility of accidental release from on-site storage and use areas, or during transportation to or from the site, as described below.

The Proposed Action would continue to utilize the transportation routes analyzed in the BMM EIS (BLM, 1995a), as described in Sections 2.3.1 and 3.21.1. The impacts associated with the Proposed Action would involve the continuation of the hazardous material and waste management practices currently in use and previously analyzed through NEPA. It is anticipated that the Proposed Action would not result in a change to the current classification of Small Quantity Generator of hazardous waste.

Process chemicals and fuel would continue to be transported by truck along the highways in the region, using both routes identified in Section 2.3.9 (Figure 1-1). Trucks would also continue to transport small quantities of hazardous waste on an infrequent basis. The Proposed Action would result in an increase in mine production and an increase of 10 to 15 percent in deliveries of process chemicals and fuel. Transporters would continue to comply with all applicable state and federal regulations governing the transportation of hazardous materials and waste.

The existing Class III waivered landfill would be expanded, or a second landfill located in the Proposed Action area would be permitted and opened, to accommodate non-hazardous waste generated by the Proposed Action. Antifreeze, lead-bearing wastes, waste oil, and used solvent would continue to be recycled at approved off-site facilities. The production of these materials is anticipated to increase by approximately 25 to 40 percent under the Proposed Action.

Fuel storage would continue in aboveground tanks with secondary containment structures capable of containing 110 percent of the volume of the largest tank. Engineering controls, which help to reduce exposure to potential hazards through isolation/containment (including leak detection) of fuel and chemicals during storage and use, in addition to actions included in the Spill Contingency Plan (BMM, 2009) and the Emergency Response Plan (BMM, 2009) reduce the risk of an on-site chemical or fuel release. Therefore, the risk of chemical or fuel release to the environment would continue to be more likely during transportation operations to and from the Proposed Action area.

Disposal of hazardous materials is discussed below.

Probability of a Release
Process chemicals, fuel, and waste materials could be accidentally released during transport to and from the Proposed Action area. The Proposed Action would require the continuation of transport to the BMM Operations of the materials and quantities shown in Table 3-36. The Proposed Action would increase the quantities of primary fuels and reagents from those currently utilized at BMM operations as shown in Table 3-36. The associated truck deliveries for the Proposed Action are described below.

The probability of a truck accident involving hazardous materials was estimated in the 1995 EIS (BLM, 1995a) using national accident statistics from 1983 to 1992, haul distances, and the number of deliveries estimated per year. This information has been updated and analyzed to include national accident statistics for truck shipments of hazardous materials (FMCSA, 2001). The primary emphasis in this analysis has been placed upon the release of liquid material that could pose an immediate human health hazard or an off-site contaminant hazard, which is consistent with the methods used in the 1995 EIS. The estimated deliveries of liquid sodium cyanide, diesel fuel, and hydrochloric acid have therefore been included in this analysis.

The probability of a truck accident that would result in the release of the selected hazardous materials was calculated using the national rate of releases per mile traveled. The travel route distance is 75 miles. The calculated life-of-mine truck deliveries are as follows: diesel fuel – 4,368; hydrochloric acid – 36; and liquid sodium cyanide – 2,496. The release probability was calculated over a mine life of 12 years. Table 3-37 shows the data used to calculate the release probability.

The results of the analyses (Table 3-38) show the probability of a release for each chemical is as follows: sodium cyanide – probability of 44.5 in 1,000; diesel fuel – probability of 162.6 in 1,000; hydrochloric acid – probability of 0.4 in 1,000. These results indicate a fairly low probability of an accidental release of hazardous materials to the environment during the estimated life of the Proposed Action. National accident statistics for flammable and combustible materials (diesel fuel) indicate a higher incidence of release per mile of travel than the other two categories used in this analysis. The probability of a release to the environment in a populated area is estimated to be approximately 100 times less than the estimates shown in Table 3-38 due to the fact that one mile of the 75-mile route is located within a developed area. Based upon the small quantities of hazardous waste that would be generated by the Proposed Action, an accident resulting in a release to the environment is not anticipated.

TABLE 3-37 HAZARDOUS MATERIAL NATIONAL ACCIDENT RATE PER MILE

HAZARDOUS MATERIAL CATEGORY	HAZMAT MILES	TOTAL HAZMAT ACCIDENTS	HAZMAT ACCIDENT RATE ACCIDENT/MILE
2.3 – Poison Gas	50,000,000	12.020	2.38753E-07
3 – Flammable & Combustible	2,800,000,000	1,379.021	4.96414E-07
8 – Corrosive	1,900,000,000	257.000	1.32109E-07

Source: Federal Motor Carrier Safety Administration, Comparative Risks of Hazardous Materials and Non-Hazardous Materials Truck Shipment Accidents/Incidents, March 2001.

TABLE 3-38 HAZARDOUS MATERIAL PROBABILITY OF TRANSPORTATION RELEASE

HAZARDOUS MATERIAL CATEGORY	NUMBER OF LIFE OF MINE TRUCK DELIVERIES	LOADED TRUCK HAUL DISTANCE PER TRIP	ACCIDENTS PER MILE1	RELEASE PROBABILITY
Sodium Cyanide (2.3)	2,496	75	2.38753E-07	0.0445
Diesel Fuel (3)	4,368	75	4.96414E-07	0.1626
Hydrochloric Acid (8)	36	75	1.32109E-07	0.0004

[1] The rate is based upon the Haz Mat Category of the Chemical shown in Table 3-36.

Perennial water sources along the State Route 892 transportation route include the following:

- Water Canyon drainage;
- Cold Creek Reservoir, Cold Spring, and Cold Creek;
- Minoletti Spring;
- Goicoechea Ranch Pond and unnamed spring;
- Unnamed springs (Section 34, Township 22 North Range 55 East; Sections 15, 22, and 34, Township 21 North, Range 55 East; Sections 3, 10, 15, 22, 27, and 34, Township 20 North, Range 55 East);
- Strawberry Ranch Springs;
- May Creek;
- Sadler and Water Canyon drainages;
- Stock pond Section 30, Township 18 North, Range 55 East; and
- Several irrigation wells along State Route 892.

These perennial water sources either cross or are within 0.25 mile of the 75-mile long State Route 892 route and thus have potential to be affected by a release. Only one spring (North Spring in Section 31, Township 19 North, Range 59 East) is within 0.25 mile of the Long Valley Road from U.S. Highway 50 to Mooney Basin.

Effects of a Release

The environmental effects of a release would depend on the substance, quantity, timing, and location of the release. The potential for off-site releases during transportation is calculated for hazardous substances only and does not indicate a volume or location. The event could range from a minor oil spill on the project site where cleanup equipment would be readily available to a large fuel or chemical spill during transportation. Some of the chemicals could have immediate adverse effects on water quality and aquatic resources if a spill were to enter a flowing stream or a spring/wetland area. However, considering the transport routes, the probability of a spill entering a wetland or other waterway would be low. Therefore, it is unlikely that spills of these materials would impact waterways.

As stated previously, the primary emphasis in this analysis is placed upon the release of liquid material that could pose an immediate human health hazard or an off-site contaminant hazard (hydrochloric acid, diesel fuel, and sodium cyanide). However, other fuels and reagents would continue to be delivered to the BMM operations and stored on site. These other fuels and reagents include ethylene glycol, methanol, propane, ammonium nitrate, sodium hydroxide, and calcium oxide (Table 3-36). The delivery of these materials also represent a potential for an off-site release during transportation but would not pose the same threat to human health or cause the same level of potential adverse effects on water quality or aquatic resources. Deliveries of these fuels and reagents are subject to the same response, reporting, and cleanup procedures as the chemicals that receive primary emphasis in this analysis.

Hydrochloric acid spills that occur on the ground or in water would have the potential to impact local populations of aquatic and terrestrial life through the oxidizing action that destroys plant and animal cells. An acid spill into a waterway would have the potential to migrate from the initial spill site. Rapid response to any spills and subsequent cleanup actions would result in no lasting damage to the environment.

A release of diesel fuel to the ground would have the potential to impact vegetation and could ignite, causing a range fire. A spill into a waterway would cause contamination of water and soil, likely affecting local aquatic populations. With rapid response and cleanup actions, diesel contamination would not increase hydrocarbons in soils, surface water, or groundwater.

The effect of a sodium cyanide release would be more variable than a release of diesel fuel or hydrochloric acid and would depend on the amount of the release, the location of the release (e.g., dry upland area, wetland area, or flowing stream), the organisms exposed, and the chemical conditions at the release location. The release of sodium cyanide would likely cause the poisoning of aquatic and/or terrestrial species depending on exposure and concentrations. Environmental effects of a cyanide spill would be limited in extent and time of contamination due to the natural degradation of cyanide in the environment.

Public Safety

Any large-scale release of these chemicals could have implications for public health and safety. The location of the release would again be a primary factor in determining its importance. However, the probability of a release is low, as is the probability of a release in a populated area. Therefore, it is not anticipated that a release involving a severe effect to human health or safety would occur during the life of the project.

In the event of a release during transport, the commercial transportation company would be responsible for first response and cleanup. Local and regional law enforcement and fire protection agencies also may be involved to secure the site and protect public safety. In the event of an accident involving hazardous substances, the carrier must notify local emergency response personnel as described in Section 2.3.11. The release of a reportable quantity of a hazardous substance must be reported to the appropriate state and federal agencies within the specified time frames. The BMM North Operations Area Project Emergency Response Plan (BMM, 2009) would include a plan for the response of mine resources to off-site transportation hazardous material releases.

Alternative A – Partial Backfill Alternative
This alternative would not result in any change in transportation, storage, use, and disposal of hazardous material compared with the Proposed Action.

Alternative B – Mooney Basin Heap Leach Pad Alternative
This alternative would not result in any change in transportation, storage, use, and disposal of hazardous material compared with the Proposed Action.

No Action Alternative
This alternative would consist of continued mining and processing at BMM and Mooney Basin Operations Area under currently permitted authorizations. The actual duration of the project would be dependent upon site-specific economic conditions. Continued mining and mineral processing would involve the transportation, handling, storage, use, and disposal of hazardous material. Deliveries of hazardous materials and waste to and from BMM and Mooney Basin Operations Area would continue until the activities in these authorizations are complete. There would be no change to the types and amounts of hazardous substances used during the project operation. Therefore, the existing delivery frequency would remain unchanged.

3.22 Proposed Mitigation

The Proposed Action includes Design Features and Best Management Practices, which serve to mitigate the range of impacts of the proposal. Appropriate mitigation has thus been incorporated, and no additional mitigation is proposed in response to anticipated impacts.

3.23 Other Environmental Consequences

3.23.1 Relationship between the Short-term Use of the Environment and the Maintenance of Long-term Productivity

Many of the impacts associated with the Proposed Action would be short-term and would cease following successful reclamation. However, decreases in long-term soil and vegetation productivity in reclaimed areas are expected. Long-term soil and vegetation productivity under the action alternatives is expected to be generally the same as under the Proposed Action.

3.23.2 Irreversible or Irretrievable Commitments of Resources

Construction and operation of the BMM North Operations Area Project could result in either the irreversible or irretrievable commitment of certain resources. “Irreversible” is a term that describes the loss of future options. It applies primarily to the effect of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over long periods of time. “Irretrievable” is a term that applies to the loss of production, harvest, or use of natural resources. For example, livestock forage production from an area is lost irretrievably while an area is serving as a mining area. The production lost is irretrievable, but the action is not irreversible. If the use changes and the mine is reclaimed, it is possible to resume forage production. Irreversible and irretrievable impacts of the Proposed Action area are summarized in Table 3-39.

TABLE 3-39 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES OF THE PROPOSED ACTION

Resources	Irreversible Impacts	Irretrievable Impacts	Explanation
Surface Water	No	No	No impacts to surface water are anticipated.

Resources	Irreversible Impacts	Irretrievable Impacts	Explanation
Groundwater	No	No	Once the project is complete and groundwater pumping has ceased, groundwater levels would rebound to original or near original static water levels.
Geology and Minerals	Yes	Yes	Once mineral reserves are mined, they would no longer be available for future production.
Paleontology	No	No	No disturbance to significant or critical paleontological resources is expected.
Soils	Yes	No	Soils from disturbed areas would be salvaged for use in reclaiming other areas. The soil structure would be permanently altered by salvaging and stockpiling the soil for reuse.
Vegetation	Yes	Yes	A total of 540 acres of vegetation would be lost as a result of the permanent open pits.
Special Status Plant Species	No	No	No impacts to special status species are expected.
Non-Native Invasive Species	No	No	Successful reclamation Design Features and Best Management Practices designed to exclude and treat noxious weeds from the BMM North Operations Area Project would minimize impacts from noxious weeds. Invasive species would have an increased opportunity to establish in disturbed areas. Design Features, Best Management Practices, and successful reclamation would minimize these impacts.
Wildlife	Yes	Yes	A total of 540 acres of wildlife habitat would be lost as a result of the permanent open pits. There is the potential for the mine facilities to act as a barrier in a portion of the deer migration corridor during operations.
Migratory Birds	Yes	Yes	A total of 540 acres of habitat would be lost as a result of the permanent open pits.
Special Status Animal Species	Yes	Yes	A total of 540 acres of habitat would be lost as a result of the permanent open pits. Approximately 312 acres of this disturbance would be in potential pygmy rabbit habitat. Disturbance in other areas such as pinyon-juniper would include displacement due to mining activities.
Wetlands, Riparian Zones, and Waters of the U.S.	No	No	No impacts to wetlands, riparian zones, or Waters of the U.S. are expected.
Range Resources	Yes	Yes	There would be a temporary loss of 98 animal unit months throughout the life of the project and a permanent loss of 14 animal unit months.
Wild Horses	Yes	Yes	A total of 540 acres of range would be lost as a result of the permanent open pits. Short-term disturbance would include displacement due to mining activities.
Land Use and Access	Yes	Yes	There would be irreversible and irretrievable impacts to 540 acres of public access and land as a result of open pits.
Recreation	No	Yes	The disturbance as a result of the open pit development would create a minimal loss of recreation area.
Air Quality	No	Yes	Emissions from the project would not deteriorate the existing air quality in the Proposed Action area.
Visual Resources	No	Yes	Impacts to visual resources would result from the expansion of the existing operations. Successful reclamation procedures at the end would partially return the visual continuity.
Noise	No	No	Noise is not considered irreversible because it would cease when mining operations ceased.

Resources	Irreversible Impacts	Irretrievable Impacts	Explanation
Socioeconomics	Yes	No	The economic wealth generated from the production and further use of the gold resources underlying the BMM North Operations Area Project would be irreversible. The jobs, income, and taxes created over the life of the project reflects irreversible resource commitment to achieve such production but also represents a measure of economic benefits associated with the project.
Environmental Justice	No	No	No impacts to environmental justice are expected.
Cultural Resources	Yes	Yes	Disturbance of cultural sites would result in the permanent loss of site context. Cultural sites would be treated in accordance with the Programmatic Agreement.
Native American Religious Concerns	No	No	No impacts to Native American Religious Concerns are expected.
Hazardous and Solid Waste/Hazardous Materials	No	No	The probability of a release of chemicals or fuel during transport is low with an even lower potential for a spill to occur in a sensitive area. Small spills of chemicals and/or fuels are more likely to occur on the mine site and thus have short-term impacts to soils and possibly vegetation. Mitigation of these spills would eliminate any lasting impacts to resources.

3.23.3 Unavoidable Adverse Impacts

Implementation of Design Features (Table 2-13) and BLM Best Management Practices (Appendix D) would reduce most adverse impacts that would result from the Proposed Action. Unavoidable adverse impacts (residual impacts) that would remain are summarized below by resource. Unavoidable adverse impacts for the action alternatives would be the same as those for the Proposed Action, except where specifically noted.

Groundwater

The current groundwater withdrawal rate would increase to approximately 80 million gallons a year, for a total of approximately 180 million gallons a year. No unavoidable adverse impacts are anticipated to wells in Newark and Huntington valleys, seeps and springs within the Plan of Operations boundary, or Ruby Lake National Wildlife Refuge.

Soils

Approximately 3,920 acres of disturbance would occur, permanently altering the soil structure and impeding soil development while the soil is stockpiled for future use.

Vegetation

Approximately 3,920 acres of disturbance would occur. Following reclamation, vegetation community types might differ from those originally present.

Non-Native Invasive Species

Approximately 3,920 acres of disturbance would occur, increasing the potential for noxious weeds to become established and dispersed off-site and along transportation routes.

Wildlife

Approximately 3,920 acres of disturbance to wildlife habitat would occur, resulting in a temporary loss of habitat until the disturbed areas can be successfully reclaimed. Reclaimed areas might differ from the original vegetation communities to the benefit of some species and the detriment of others. Approximately 540 acres of habitat would be lost permanently as a result of the expanded pits. Wildlife displaced from disturbed areas would be forced into adjacent habitats, increasing the potential for competition with resident individuals. Wildlife could be at greater risk of collisions with vehicles, and smaller and less mobile animals could suffer direct mortality during land clearing activities. Seasonal movement of mule deer herds could be impeded to some degree.

Migratory Birds
Approximately 3,920 acres of disturbance to migratory bird habitat would occur, resulting in a temporary loss of habitat until the disturbed areas can be successfully reclaimed. Reclaimed areas might differ from the original vegetation communities to the benefit of some species and the detriment of others.

Special Status Wildlife Species
Disturbance could occur on the margins of occupied pygmy rabbit habitat. Other disturbance could reduce foraging habitat for ferruginous hawks and burrowing owls. The reduction in pinyon-juniper woodland would reduce nesting habitat for the pinyon jay, juniper titmouse, and other forest-dependent and cavity-nesting species.

Range Resources
Approximately 3,920 acres of disturbance to rangeland would occur, possibly resulting in a reduction in stocking level, depending on other range condition factors. Disturbed areas would be reclaimed and the impact would be temporary for all but approximately 540 acres of pit expansion, which would be permanently lost.

Wild Horses
Approximately 3,920 acres of disturbance to the Triple B Herd Management Area would occur, resulting in a reduction in available forage. Disturbed areas would be reclaimed and the impact would be temporary for all but approximately 540 acres of pit expansion, which would be permanently lost. Wild horses could be affected by increased disturbance from vehicles and equipment, blasting, potential collisions with vehicles, and interference with herd movements.

Land Use and Access
Public access to active mining areas would be restricted until mining ceases and reclamation is complete. There would be an increase in traffic on mine access roads and the need for additional road maintenance.

Recreation
Recreational access to active mining areas would be restricted until mining ceases and reclamation is complete.

Air Quality
Impacts to air quality from additional mine development activities include slight increases in tailpipe and fugitive dust emissions from additional deliveries and construction. It is estimated that increased PM_{10} and sulfur dioxide emission would be negligible and there would be an increase of less than one ton per year each of carbon monoxide, nitrogen oxide, and volatile organic compounds. Fugitive dust is expected to increase by approximately 78 tons per year. There would be a total of 57.7 pounds of mercury emissions as a result of thermal source emissions and fugitive emissions.

Visual Resources
During active mining, the additional disturbance would create a strong visual contrast with the surrounding landforms and vegetation. Following recontouring and successful reclamation, the

contrast would be reduced so that it would not attract the attention of viewers. Some permanent alterations to the landscape such as open pits would remain.

Noise

The Proposed Action would result in additional blasting and construction noise in the mine vicinity and a minor increase in traffic-related noise along access routes. Noise impacts would cease following reclamation and closure of the mine.

Socioeconomics

The staffing level under the Proposed Action would increase to a maximum of 325 employees, which represents a 50 percent increase over current employment. White Pine County would be the recipient of the mine's ad valorem tax payments and would receive a share of the net proceeds tax. The additional revenue would assist White Pine County in stabilizing its finances. All three counties (White Pine, Eureka, and Elko) would benefit from local spending by residents employed by the mine. Initially at least, most new employees from outside the analysis area would likely reside in Elko. County services should be adequate for the anticipated increase in population.

Cultural Resources

The Proposed Action would result in the loss of all prehistoric and historic archaeological sites directly impacted by construction and/or maintenance of the expanded mining facilities. Any archaeological sites experiencing impacts from either the Proposed Action or alternatives, and deemed eligible for inclusion in the National Register of Historic Places, would be mitigated in accordance with the Programmatic Agreement (Appendix J).

Hazardous and Solid Waste/Hazardous Materials

During the life of the Proposed Action there would be a low probability of an accidental release of hazardous materials during transport. Approximately six miles of the 75 miles of access routes cross sensitive resource areas with potential to release a hazardous substance into a wetland or riparian area. The environmental effects of a release would depend on the substance, quantity, timing, and location. The effects would range from minor for a spill at the project site (equipment immediately available to limit spill) to a large spill during transport that could immediately impact water quality and aquatic life, if spilled into a flowing stream. The likelihood of a major spill into a flowing stream is low.

3.23.4 Incomplete or Unavailable Information

The following identifies resources where information was either incomplete or unavailable for use in development of the FEIS. Only those resources where deficient information was identified are listed. The Council of Environmental Quality regulations provide direction on how to proceed with the preparation of the FEIS when information is incomplete or unavailable. The following sections provide the necessary data to address the Council on Environmental Quality regulations with regard to incomplete or unavailable information. As indicated below, none of the incomplete or unavailable information identified was critical to the impact analysis in this FEIS.

Water Resources

Incomplete Information – The deep bedrock hydrogeology of the study area is unknown.

Relevance of Incomplete Information – The lack of specific data associated with the deep bedrock hydrogeology is unlikely to significantly affect the impact analysis because all existing and proposed pits are and would be above the identified bedrock groundwater system. Exploration drilling did not identify any major groundwater control structures within the proposed ore bodies to be mined using open pit techniques. In addition, the existing production wells are within an unconfined alluvial aquifer and there are no other users within five miles of the existing production wells.

Summary of Existing Information – Data used in the analysis is based primarily on exploration drilling data, existing pit data, U.S. Geological Survey groundwater data, and data from the existing production wells. Data used to predict impacts to groundwater quality are based on results from sampling and analysis of existing waste rock and ore, and materials obtained during the exploration program.

Approach to Evaluate Impacts – Neither existing nor proposed pits would intersect the deep bedrock aquifer based on exploration data, thus no impacts to quantity of water are anticipated (no dewatering required). Potential impacts to quality of water are addressed in Chapter 3 and based on existing analytical data from waste rock and ore samples.

Modeling of the potential cone of depression around the existing production wells was completed based on test data collected from the existing production wells. The modeled cone of depression was mapped with the closest existing wells to the BMM. This data was used to determine the potential impacts from the increased production from the existing wells.

Conclusion – The lack of information on the deep bedrock hydrogeology did not significantly affect the impact analysis, primarily due to the fact that the bedrock system would not be intercepted by the existing nor proposed pits.

Non-native Invasive Species

Incomplete Information – A complete survey for non-native invasive species that are not listed as noxious weeds has not been performed for the entire Proposed Action area.

Relevance of Incomplete Information – Surveys for non-native invasive species are labor intensive and expensive, and generally become obsolete in a short period due to the speed with which weeds can expand in the new areas.

Summary of Existing Information – Existing data used in the analysis of impacts included data from the biological baseline report (SRK, 2007), the BLM GIS database (BLM, 2007a), and the Tri-County Weeds Program (Tri-County Weeds, 2007). The majority of this data provides information on noxious weeds, although some mention of the presence of non-native invasive species is provided. However, neither the locations of the non-native species nor the prevalence of these species are provided in these reports and reference material.

Approach to Evaluate Impacts – The approach to developing the impact analysis primarily focuses on the potential for additional establishment of non-native invasive species in newly disturbed areas. Because of the speed of which many of these species become established on disturbed ground, the analysis assumes the potential for all disturbed ground to be at risk for non-native invasive species establishment. Based on this assumption along with the implementation of the design features, the potential impacts are developed.

Conclusion – The lack of specific data on the current extent and locations of non-native invasive species within or adjacent to the Proposed Action area was not critical for the analysis of the potential impacts. Potential impacts were based on the assumption that all existing and new disturbance is at risk for non-native invasive species establishment and that design features (Table 2-13) and BLM Best Management Practices (Appendix D) implemented by Barrick, would eliminate or reduce the risk of the potential impacts.

Recreation
Incomplete Information – Actual recreation usage (the number of hunters, off-road vehicles, etc.) is unknown and there is no mechanism for obtaining such detailed information. Therefore, it is not possible to know the exact number of recreational users that would be affected.

Relevance of Incomplete Information – The exact number of recreation users around the Proposed Action area is not critical to the analysis because recreational use is relatively light due to the distance from population centers and the lack of features (water sources, established trails, etc.) that would attract large number of recreational users.

Summary of Existing Information – Some recreational use activity is known for some areas in the vicinity of the Proposed Action including Loneliest Highway Recreation Management Area, Cold Creek Reservoir, Garnet Hill Rockhounding Area, and Illipah Reservoir. These areas would typically have higher use due to established recreational activities (rockhounding, fishing, boating, etc.).

Approach to Evaluate Impacts – The knowledge of light recreational usage in the area surrounding the Proposed Action is adequate for estimating potential recreational impacts on the Proposed Action. Knowing that the area does not support heavy recreational use and that there is a significant amount of adjacent public lands for recreational use, is sufficient information to identify the potential impacts of the Proposed Action.

Conclusion – Although the exact number of recreational users of the area is not known, the existing information about recreational use was sufficient for the impact analysis.

Air Quality
Incomplete Information – No monitoring data exist for air pollutant concentrations in the direct impact analysis area. It was not feasible to collect this information because a minimum of several years of data would be needed for the data to be meaningful and it is not common nor required for mines or sources below the prevention of significant determination major source threshold to collect this type of data.

Relevance of Incomplete Information – Due to the remote nature of the Proposed Action area and lack of other pollutant sources in the area, the lack of air pollutant concentration data from the site would not result in significant changes to the impact analysis. Regional source data used for the analysis is likely more conservative (higher concentrations) than what actually exist at the Proposed Action area due to potential impacts from urban areas upwind of the regional source data area, and was accepted as such by the Nevada Division of Environmental of Protection.

Summary of Existing Information – Regional data from several sources were used to represent the expected conditions of the project area. The regional data was selected based on the Proposed Action area being very remote from urban and industrial areas. Specific pollutants from the regional data used in the analysis are likely conservative due to the location of one of the source data (Barstow, California), which are likely impacted by pollutants within the Los Angeles basin.

Approach to Evaluate Impacts – The approach to the impact analysis would not differ if site specific data was used instead of the regional data. The same modeling approach would be used because the regional data is assumed to represent background conditions onsite and in the vicinity.

Conclusion – The lack of site specific pollutant data would not change the approach of the impact analysis nor significantly change the results of the impact analysis. The regional data is likely to be more conservative than actual site specific data.

Socioeconomics

Incomplete Information – Two areas of potentially incomplete data were identified during the development of the socioeconomic baseline data and impact analysis:

- Information that could potentially impact the accuracy of the IMPLAN model used in the analysis included data that is self-reported to government agencies. Self-reporting depends on the judgment of respondents to classify and report new information; and

- Legally mandated privacy requirements prevent disclosure of proprietary economic data. This is a particular problem in small, rural economies, where because of the limited number of businesses, disclosure of some data could reveal proprietary information.

Relevance of Incomplete Information – With regard to the self-reporting data, the differences in judgment from individuals required to report data may result in data-reporting inconsistencies. This is typically a deficiency inherent in the most data collection processes. In dealing with proprietary information, the IMPLAN model attempts to fill in these data gaps through the use of state averages; however, some inaccuracies are likely to occur.

Summary of Existing Information – The most recent available public socioeconomic information was obtained from the state of Nevada, Elko County, White Pine County, Eureka County, and the communities within these counties.

Approach to Evaluate Impacts – The data obtained on socioeconomic conditions for each county and the main communities within those counties were used in the IMPLAN model. This model then estimated the economic impact associated with the Proposed Action. As indicated above, the self-reporting data inaccuracies and information that is unavailable due to proprietary issues would likely result in some inaccuracies with the IMPLAN model. However, the best readily available public information was used to determine the socioeconomic impacts.

Conclusion – Although some inaccuracies in the socioeconomic data may be present, the best available socioeconomic data was used in the impact analysis.

3.23.5 Relationship between the Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

This section provides the tradeoffs between short-term impacts and long-term impacts to environmental resources that would occur with implementation of the Proposed Action.

Short-term adverse impacts associated with the Proposed Action would include the temporary loss of vegetation, loss of soil productivity, temporary increase in erosion potential and sedimentation in ephemeral drainages, potential increase of non-native invasive species, loss of wildlife habitat and displacement of wildlife, temporary loss of grazing resources for livestock and wild horses, slight increases in fugitive dust emissions and other emissions from other sources, loss of public access to additional lands for recreation and other uses, temporary noticeable changes to the viewshed, and an increase in noise.

Short-term beneficial impacts would include continued employment for the local communities and generation of tax revenue for White Pine County and spending revenue in Elko, Eureka, and White Pine counties.

Long-term impacts are highly dependent on the success of reclamation. Since successful reclamation is required as part of the reclamation permit, it is anticipated there would be minimal long-term impacts. Long-term impacts to resources would vary with some changes in vegetation resulting in beneficial impacts to wildlife. This includes the long-term productivity of vegetation as a result of conversion from pinyon-juniper woodland to grass-shrub habitat. The grass-shrub habitat would provide better long-term forage for wildlife, primarily deer. There would be a long-term loss of soil productivity due to the disturbance of the soil structure, which may result in a change in vegetation productivity. There would be a permanent loss of habitat that would result from pit expansion. This would result in a long-term loss of area for productive vegetative growth and for forage for wildlife and livestock.

3.23.6 Energy Requirements and Conservation Potential of Various Alternatives and Mitigation Measures

As with current operations, two sources of energy would be used during the operation of the Proposed Action. These are electricity supplied through existing power lines and liquid fuels used for mobile equipment and generators. Electricity supplied through existing power lines is used for lighting, powering process equipment, and power for the buildings including the office, maintenance shops, warehouse, and other facilities. One new facility, the maintenance shop at the Top/Sage Pit complex, is proposed to be constructed under the Proposed Action. A new power line and substation would be constructed to supply power to the maintenance shop. Power requirements for the Proposed Action would be slightly higher than the current needs. No new major facilities are planned that would result in a significant increase in the power demand.

There may be an increase in fuel consumption for additional equipment needed for the Proposed Action. This potential increase in fuel consumption may be offset by better fuel efficiency as a result of newer equipment being used under the Proposed Action. In addition, Barrick would implement conservation measures to minimize the use of fuel at the mine site. This would have a dual benefit by reducing both emissions and costs.

3.23.7 Adverse Energy Impact

BLM Instruction Memorandum No. 2002-053 directs that the adverse impacts of decisions on "energy development, production, supply, and/or distribution" be considered. This project does not include nor would it impact energy development, production, supply, and/or distribution.

3.23.8 Natural or Depletable Resource Requirements and Conservation Potential of Alternatives and Mitigation Measures

It is the nature of mining to develop depletable resources by removal of ore and processing the ore to remove the identified mineral. In the case of Bald Mountain, the depletable resource is gold and silver contained within the ore. All the identified alternatives analyzed within this FEIS would not differ in the extraction of the depletable resource.

3.23.9 Urban Quality, Cultural Resources, and the Design of the Built Environment, Including the Reuse and Conservation Potential of Various Alternatives and Mitigation Measures

The Proposed Action identified in the Plan of Operations and this FEIS and the alternatives analyzed would have no effect on urban quality or the built environment. There are some historic and cultural resources that have been identified within the Plan of Operations boundary. Potential impacts to these resources would be handled in accordance with the Programmatic Agreement between the project proponent and the BLM. There would only be minor changes to the anticipated impacts to historic and cultural resources with implementation of the alternatives, due to the slightly less surface disturbance associated with the alternatives.

Chapter 4
Cumulative Effects

4.1 Introduction

As required under NEPA and the regulations implementing NEPA, this section analyzes potential cumulative impacts from past, present, and reasonably foreseeable future actions combined with the Proposed Action within the cumulative effects study area specific to the resources for which cumulative impacts may be anticipated. A cumulative impact is defined as "the impact which results from the incremental impact of the action, decision, or project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 Code of Federal Regulations 1508.7).

This analysis focuses on cumulative impacts of the Proposed Action and other actions both within and outside of the Proposed Action area. A qualitative description of the differences in cumulative impacts between those associated with the Proposed Action and those with other alternatives is included.

Nevada BLM Instruction Memo NV-90-435 specifies that impacts must first be identified for the Proposed Action (i.e., the proposed BMM North Operations Area Project) before cumulative impacts with other actions can occur.

As related to the Proposed Action, cumulative impacts are addressed for the following resources:

- Water Resources;
- Geology and Minerals;
- Paleontology;
- Soils;
- Vegetation;
- Non-native Invasive Species;
- Wildlife (including Migratory Birds and Special Status Species);
- Migratory Birds;
- Wetlands and Riparian Areas;
- Range Resources;
- Wild Horses;
- Land Use and Access;
- Recreation;
- Air Quality;
- Visual Resources;
- Noise and Vibration;
- Socioeconomics;
- Cultural Resources; and
- Hazardous and Solid Waste/Hazardous Materials.

Since no direct or indirect impacts to special status plant species, federally-listed animal species, Environmental Justice, and Native American Religious Concerns associated with the Proposed Action were identified in the discussion in Chapter 3, they are not addressed in the cumulative impacts discussion.

4.1.1 Time Frame for Analysis

The reasonably foreseeable time frame for the cumulative impact analysis is 25 years. Twenty-five years represents 10 years of the anticipated life of the mine and an additional 15 years for reclamation (earthwork, revegetation, and stabilization of process fluids). The actual time frame for reclamation activities, primarily the stabilization of process fluids, can range between five years and more than 20 years. An average of 13 years was used for this cumulative impact analysis.

For the purposes of this analysis and under federal regulations, "impacts" and "effects" are assumed to have the same meaning and are interchangeable. The cumulative effects analysis was accomplished through the following steps:

- Step 1: Establish appropriate geographical areas for analysis by resource;
- Step 2: Identify all past, present, and reasonably foreseeable future actions relevant to the resources in the cumulative effects study areas;
- Step 3: Summarize the effects of the Proposed Action in conjunction with past, present, proposed, and reasonably foreseeable future actions;
- Step 4: Provide a cumulative impacts conclusion; and
- Step 5: Discuss the variation in cumulative impacts between the Proposed Action and other alternatives.

4.1.2 Interrelated Projects

Interrelated projects are defined for this FEIS as activities that could interact with the Proposed Action in a manner that would result in cumulative impacts. Interrelated projects have been grouped as past, present, and reasonably foreseeable future actions. The interrelated projects are listed and described below. Table 4-1 quantifies surface disturbance characteristics of each project that is relevant to cumulative impacts. Surface disturbance characteristics were selected to describe the interrelated projects because it allows the combined surface disturbance impacts of interrelated projects to be totaled. The interrelated projects are shown in Figures 4-1 and 4-2, and Table 4-2 identifies potential interactions among the interrelated projects and resources. The geographic area for the cumulative impacts analysis is determined primarily by the locations of the interrelated projects and the interactions with potentially affected resources.

Past Actions

Sierra Pacific Power Company Falcon to Gonder Power Line

The Sierra Pacific Power Company Falcon to Gonder Transmission Project involved the construction of a new 345 kilovolt power line, generally located between Ely and Dunphy, Nevada (BLM, 2001a). The power line was constructed in 2003, is approximately 180 miles long, has a construction disturbance width of 160 feet, and consists of steel H-frame towers. For the purposes of this analysis, it is assumed approximately 25 miles of the power line is within the air/water resources cumulative effects study area, approximately 27 miles of the power line is within the wildlife cumulative effects study area, and 24.5 miles of the power lien is within the wild horse cumulative effects study area. Based on a 160-foot right-of-way width the corridor associated with the power lines within the different cumulative effects study areas is estimated to include 485 acres (air/water), 524 acres (wildlife), and 475 acres (wild horse).

TABLE 4-1 PAST, PRESENT, PROPOSED, AND REASONABLY FORESEEABLE FUTURE INTERRELATED ACTIONS FOR THE BMM NORTH OPERATIONS AREA PROJECT CUMULATIVE EFFECTS AREAS

Interrelated Projects	Air Quality, Water Resources, Soils, Non-Native Invasive Species, and Vegetation Cumulative Effects Study Area	Paleontology, Geology and Minerals, and Noise and Vibration Cumulative Effects Study Area	Wildlife Cumulative Effects Study Area	Cultural Resources Cumulative Effects Study Area	Visual, Recreation, and Land Use and Access Cumulative Effects Study Area	Range Cumulative Effects Study Area	Wild Horse Cumulative Effects Study Area	Hazardous and Solid Waste/Hazardous Materials Cumulative Effects Study Area	Socioeconomic Cumulative Effects Study Area
CESA Area (Acres)	**2,070,965**	**199,258**	**1,794,903**	**775,114**	**317,038**	**356,666**	**1,233,000**		**19,347,840**
Interrelated Action	**Surface Disturbance (acres)**								
	Past Actions								
SPPCo Falcon to Gonder Power Line	485	**	524	**	**	**	475.2	**	*
Oil & Gas Wells[1]	105	6	72	24	9	33	78	**	*
Illipah Mine	200	**	200	**	**	**	200	**	*
Highway 50 Corridor	290	**	375	**	**	**	**	412	*
Gravel Pits [2]	166	17	165	40	29	58	90	**	*
Casino/Winrock Mine	200	200	200	200	200	200	200	**	*
Yankee Mine	450	450	450	**	**	450	450	**	*
Bellview Project	5	**	5	5	5	**	**	**	*
Cherry Springs Canyon Exploration Project	1	**	1	1	1	**	**	**	*
Overland Pass Exploration Project	3	**	3	3	3	**	3	**	*
Alligator Ridge Project	593	593	593	**	593	593	593	**	*
Little Bald Mountain Mining Project	28	28	28	28	28	28	28	**	*
Golden Butte Mine	**	**	**	**	**	**	175	**	*
White Pine Mine	274	274	274	274	274	274	274	**	*
Socioeconomics-Specific Projects	**	**	**	**	**	**	**	**	*

Interrelated Projects	Air Quality, Water Resources, Soils, Non-Native Invasive Species, and Vegetation Cumulative Effects Study Area	Paleontology, Geology and Minerals, and Noise and Vibration Cumulative Effects Study Area	Wildlife Cumulative Effects Study Area	Cultural Resources Cumulative Effects Study Area	Visual, Recreation, and Land Use and Access Cumulative Effects Study Area	Range Cumulative Effects Study Area	Wild Horse Cumulative Effects Study Area	Hazardous and Solid Waste/Hazardous Materials Cumulative Effects Study Area	Socioeconomic Cumulative Effects Study Area
Disturbance Subtotal	**2,800**	**1,568**	**2,890**	**575**	**1,142**	**1,636**	**2,566.2**	**412**	
Present Actions									
BMM	3,418	3,418	3,418	3,418	3,418	3,418	3,418	3,418	*
Mooney Basin Operations Area	742	742	742	742	742	742	742	742	*
Oil & Gas Wells[1]	15	3	9	3	**	3	9	**	*
BMM Regional Exploration Plan	210	210	210	210	210	210	210	210	*
Little Bald Mountain Mining Project	1	1	1	1	1	1	1	**	*
Little Bald Exploration Plan	11	11	11	11	11	11	11	**	*
Silver State Fiber Optic Line	70	**	**	**	**	**	**	103	*
Notices Of Intent	50	50	50	50	50	0	50	**	*
Socioeconomics-Specific Projects	**	**	**	**	**	**	**	**	*
USFS Fuel Treatment Project	500	**	500	500	500	**	500	**	*
Disturbance Subtotal	**5,017**	**4,435**	**4,941**	**4,935**	**4,932**	**4,385**	**4,941**	**4,473**	
Reasonably Foreseeable Future Actions									
BMM NOAP (Proposed Action)	3,920	3,920	3,920	3,920	3,920	3,920	3,920	3,920	*
Alligator Ridge Mining Project	600	600	600	**	600	600	600	**	*
Midway Gold – Pan Mining Project	50	**	**	**	**	**	**	**	*
Limousine Butte Exploration Plan	**	**	**	**	**	**	88	**	*
Yankee Mining	400	400	400	**	**	400	400	**	*

Interrelated Projects	Air Quality, Water Resources, Soils, Non-Native Invasive Species, and Vegetation Cumulative Effects Study Area	Paleontology, Geology and Minerals, and Noise and Vibration Cumulative Effects Study Area	Wildlife Cumulative Effects Study Area	Cultural Resources Cumulative Effects Study Area	Visual, Recreation, and Land Use and Access Cumulative Effects Study Area	Range Cumulative Effects Study Area	Wild Horse Cumulative Effects Study Area	Hazardous and Solid Waste/Hazardous Materials Cumulative Effects Study Area	Socioeconomic Cumulative Effects Study Area
Wind Energy Projects	1,020	**	**	1,020	**	**	1,020	**	*
Oil & Gas Wells[1]	15	3	9	3	**	3	9	**	*
Socioeconomics-Specific Projects	**	**	**	**	**	**	**	**	*
Disturbance Subtotal	**6,005**	**4,923**	**4,929**	**4,943**	**4,520**	**4,923**	**6,037**	**3,920**	
Natural Processes									
Wildland Fire	*	*	*	*	*	*	*	*	*
Spread of Noxious/Invasive Weeds	*	*	*	*	*	*	*	*	*
Expansion of Pinyon and Juniper Trees and other Woody Species	*	*	*	*	*	*	*	*	*
Spread of Forest Insects and Diseases	*	*	*	*	*	*	*	*	*
Disturbance Total	**13,822**	**10,926**	**12,760**	**10,453**	**10,594**	**10,944**	**13,544**	**8,805**	

** The project not present within the CESA for this resource.
* The project is present within this CESA.
[1] Assumes 3 acres of disturbance for each past or present well.
[2] Acreage determined from BLM Shape Files 2008.

TABLE 4-2 INTERACTIONS BETWEEN RESOURCES AND INTERRELATED PROJECTS

Interrelated Projects	Water Resources	Geology and Mineral	Paleontology	Soils	Vegetation Resources	Non-Native Invasive Species	Wildlife	Wetlands, Riparian Zones, and Waters of the U.S.	Range Resources	Wild Horses	Land Use and Access	Recreation	Air Quality	Visual Resources	Noise and Vibration	Socioeconomics	Environmental Justice	Cultural Resources	Native American Religious Concerns	Hazardous and Solid Waste/Hazardous Materials
Past Actions																				
SPPCo Falcon to Gonder Power Line					X	X	X	X								X				
Oil & Gas Wells					X	X							X	X	X	X		X	X	
Illipah Mine	X			X	X	X	X	X		X			X			X				
Highway 50 Corridor					X	X	X	X					X			X				X
Gravel Pits	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Casino/Winrock Mine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Yankee Mine	X	X	X	X	X	X	X	X	X	X			X		X	X				
Bellview Project	X			X	X	X	X	X			X	X	X	X		X		X	X	
Cherry Springs Canyon Exploration Project	X			X	X	X	X	X			X	X	X	X		X		X	X	
Overland Pass Exploration Project	X			X	X	X	X	X		X	X	X	X	X		X		X	X	
Alligator Ridge Project	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Little Bald Mountain Mining Project	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Golden Butte Mine										X						X				
White Pine Mine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Socioeconomics-Specific Projects																X				
Present Actions																				
BMM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Mooney Basin Operations Area	X	X	X	X	X	X	X	X	X	X			X	X	X	X		X	X	X
Oil & Gas Wells					X	X	X			X		X	X		X	X		X	X	
BMM Regional Exploration Plan	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X
Little Bald Mountain Mining Project	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Little Bald Exploration Plan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Silver State Fiber Optic Line				X	X	X		X				X	X			X				
Notices Of Intent		X	X	X	X	X	X	X	X	X			X	X	X	X		X	X	
Socioeconomics-Specific Projects																X				
USFS Fuel Treatment Project	X			X	X	X	X	X		X	X	X	X	X		X		X	X	

Interrelated Projects	Water Resources	Geology and Mineral	Paleontology	Soils	Vegetation Resources	Non-Native Invasive Species	Wildlife	Wetlands, Riparian Zones, and Waters of the U.S.	Range Resources	Wild Horses	Land Use and Access	Recreation	Air Quality	Visual Resources	Noise and Vibration	Socioeconomics	Environmental Justice	Cultural Resources	Native American Religious Concerns	Hazardous and Solid Waste/Hazardous Materials
Reasonably Foreseeable Future Actions																				
EnXco / Power Partners Wind Project N82424					X	X							X			X		X	X	
BMM NOAP (Proposed Action)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Alligator Ridge Mining Project	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
Midway Gold - Pan Mining Project	X			X	X	X	X		X				X			X				
Limousine Butte Exploration Plan	X									X						X				
Yankee Mining	X	X	X	X	X	X	X	X	X	X			X		X	X				
Wind Energy Projects	X				X	X				X			X			X		X	X	
Oil & Gas Wells					X	X	X		X	X			X		X	X		X	X	
Socioeconomics-Specific Projects																X				
														X						
Natural Processes																				
Wildland Fire	X			X	X	X	X	X	X	X	X	X	X	X				X		
Spread of Noxious/Invasive Weeds	X			X	X	X	X	X	X	X	X	X		X						
Expansion of Pinyon and Juniper Trees and other Woody Species					X	X	X		X	X	X	X		X					X	
Spread of Forest Insects and Diseases					X	X	X	X	X	X	X	X		X					X	

Oil and Gas Wells
Numerous past (pre-2001) oil and gas notices have been filed in the region. The locations of past oil and gas notices are shown on Figure 4-1. Disturbance associated with each well is based on approximately three acres.

Illipah Mine
The Illipah Mine is currently inactive and is located approximately four miles north of Antelope Summit on U.S. Highway 50 and approximately 30 miles south of the BMM area. Several companies have conducted exploration in the area of the mine over the last 10 years. It is estimated that the mine site encompasses approximately 200 acres of disturbance (Wilson, 2008).

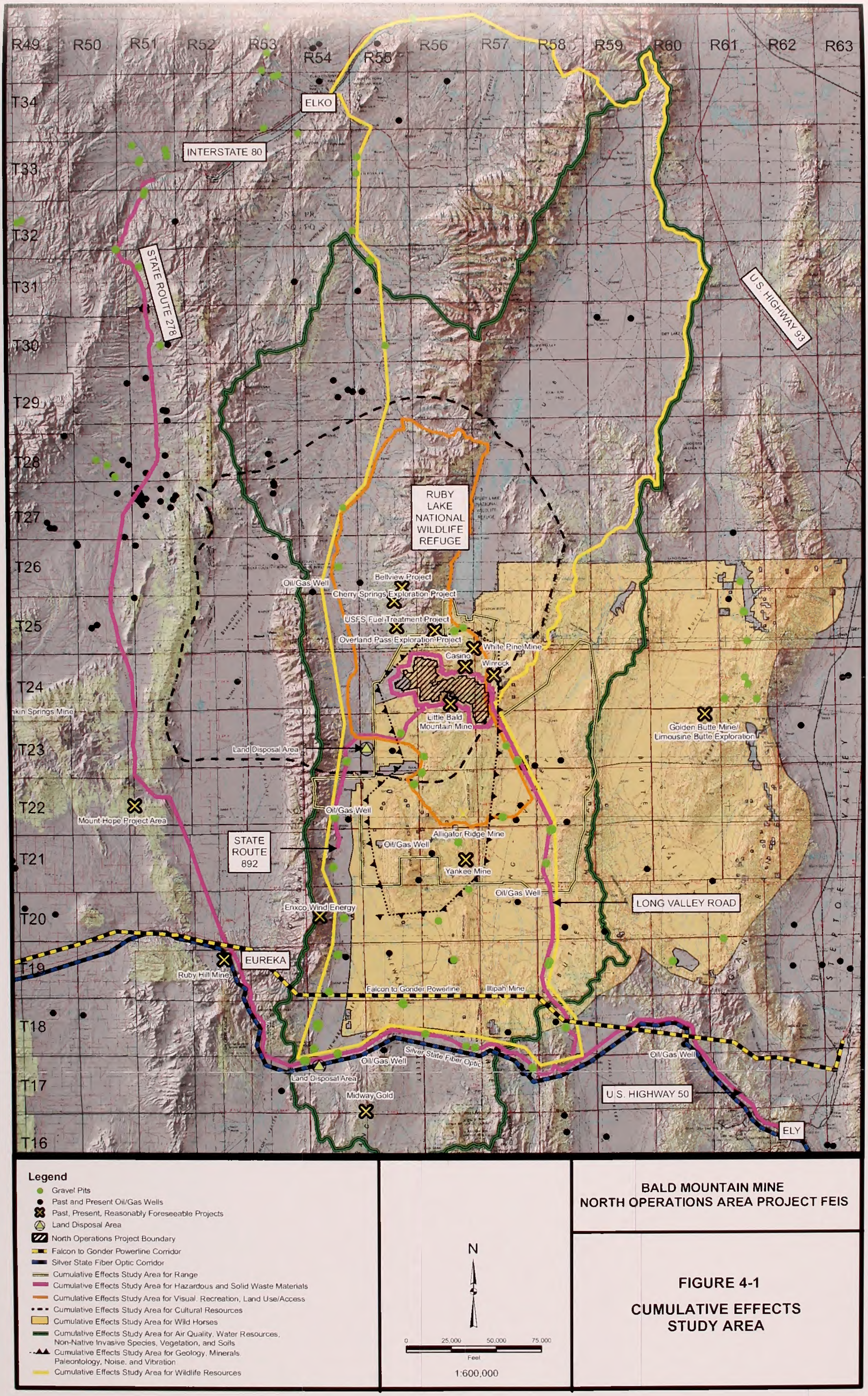
Highway 50 Corridor
U.S. Highway 50 is a paved two-lane highway located south of the project area. The highway follows portions of the Pony Express Trail and Lincoln Highway. It includes a 200-foot right-of-way with an approximate disturbance width of 100 feet. The highway forms the southern boundary of the wildlife cumulative effects study area for a distance of approximately 31 miles and is within the air, water resources, soils, vegetation, and non-native invasive species cumulative effects study area for approximately 24 miles.

Gravel Pits
Seventy-one sand and gravel (material) pits were identified adjacent to highways and in the valleys surrounding the project area. The majority of these pits are abandoned, and several more are inactive. Past gravel pits and their locations in proximity to the cumulative effects study area are shown in Figure 4-1. Approximate disturbance associated with the gravel pits is provided in Table 4-1.

Casino/Winrock Mine
The Casino/Winrock Mine consists of two inactive mine sites, Casino (north of the Proposed Action boundary) and Winrock (northeast of the BMM North Operations Area Project boundary). The mine sites include a combined heap leach facility (the Casino/Winrock leach pad) located north of the Winrock Mine. These inactive mines are located at the extreme south end of Ruby Valley, in northwest White Pine County, Nevada. Activities resulted in approximately 200 acres of disturbance; all disturbance except for approximately 33 acres of pits has been reclaimed.

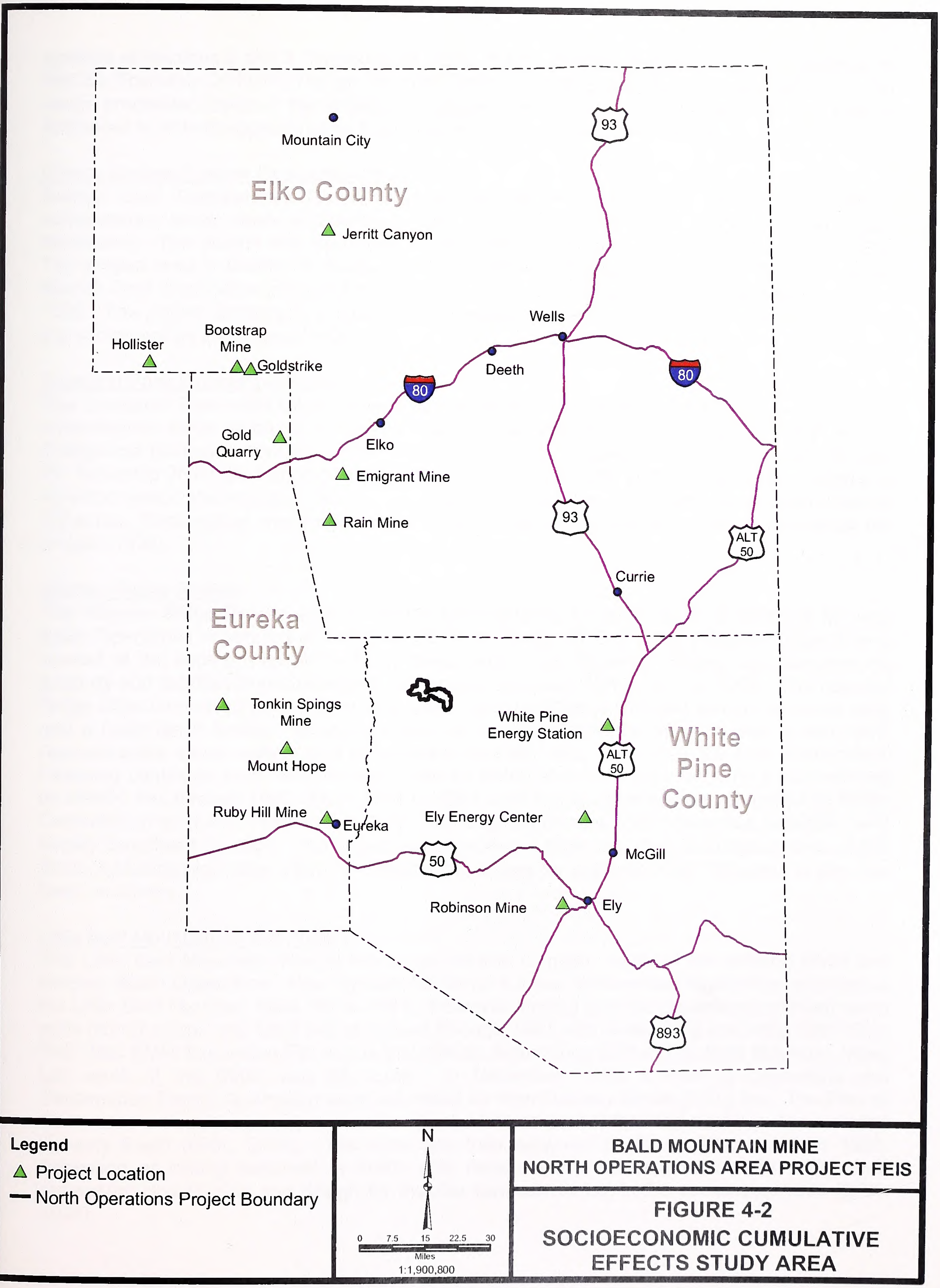
Yankee Mine
The Yankee Mine is located along the west flank of Long Valley near the southern-most edge of the Bald Mountain Mining District. An extensive drilling program was conducted by Amselco Exploration, Inc. in early 1984. Activities in the late 1980s and mid-late 1990s included open pit mining and the construction of associated waste rock disposal areas, a heap leach facility, roads, and ancillary facilities. There were several operators at the Yankee Mine prior to the Placer Dome U.S. purchase in August 1993. Currently, Barrick controls the Yankee Mine and its associated facilities. The mine consists of a six-million-ton heap leach facility, three associated process ponds, a central processing plant, 17 pits, and several waste rock stockpiles. Mining ceased at the Yankee Mine in 1998 with ongoing processing occurring until the spring of 1999. Secondary heap leaching was concluded in April 2000. Past disturbance is estimated at 450 acres.

Bellview Project
The Western States' Bellview Project was a proposed open pit mine with cyanide heap leaching. The project is located in Walker Canyon, on USFS administered lands on the west flank of the southern Ruby Mountains. The project was proposed in 1991 and is located in



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 4-1
CUMULATIVE EFFECTS STUDY AREA



Legend

- Project Location
- North Operations Project Boundary

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 4-2
SOCIOECONOMIC CUMULATIVE EFFECTS STUDY AREA

portions of Sections 2 and 3, Township 25 North, Range 56 East, and in portions of Sections 34 and 35, Township 26 North, Range 56 East. Mining was proposed for 1992 and early 1993 but never proceeded beyond the exploration phase (SRK, 2008). Disturbance in the area is estimated to include approximately five acres of reclaimed exploration roads.

Cherry Springs Canyon Exploration Project

Barrick Gold Exploration's Cherry Springs Exploration Project was proposed on USFS administered lands north of Overland Pass, on the western flank of the southern Ruby Mountains. The project was approved in 1998 with a Categorical Exclusion from the USFS. The project area is located in Sections 15, 22, and 26, Township 25 North, Range 56 East. Barrick Gold Exploration proposed to drill up to six exploration holes over a two-week period in 1998. The project temporarily affected approximately one acre. Reclamation was proposed for the same year as the project (1998).

Overland Pass Exploration Project

The Overland Pass exploration project was proposed by Cordex Exploration Co., on USFS administered lands north of Overland Pass. The project was approved in 1998 with a Categorical Exclusion from the USFS. The project area is located in Sections 19, 20, 29, and 30, Township 25 North, Range 57 East. Cordex proposed to drill up to 11 exploration holes and construct associated sumps. The project would utilize overland travel and affect approximately 3.2 acres. Reclamation was proposed and was assumed to be completed the same year as the project (1998).

Alligator Ridge Project

The Alligator Ridge Project area is located approximately 11 miles south of Barrick's Mooney Basin Operations in portions of Township 22 North, Range 57 East. The Alligator Ridge Mine is located at the southern tip of the Ruby Mountains. Bald Mountain Mining, Inc. acquired the property and facilities from the original owner and operator, USMX, Inc., in 1993. The Alligator Ridge Mine comprised seven open pits, waste rock facilities, a mill and tailings impoundment, and a heap leach facility. Mining activities at the Alligator Ridge Mine ceased in mid-1987. Approximately seven million tons of ore were leached, and about 500,000 tons were milled. Leaching continued from 1987 through 1990 by BMM, and secondary leaching was continued by USMX, Inc. through 1993. From 1993 to 1997 leaching operations were conducted by BMM. Cessation of production occurred in 1997, and ongoing closure and reclamation activities were largely completed by 2000. The project area included a total permitted disturbance area of 593 acres, including eight open pits. All disturbance, except for approximately 100 acres in pits, has been reclaimed.

Little Bald Mountain Mining Project

The Little Bald Mountain Mine is located in Bourne Canyon, south of the existing BMM and Mooney Basin Operations. New Dynasty Mines (U.S.), Inc. commenced exploration activities at the Little Bald Mountain Mine site in 1984. However, mining and ore processing on heap leach pads did not occur until 1985 and continued through 1991 with re-leaching occurring until 1992. The 1995 BMM Expansion EIS states that mining disturbance at the Little Bald Mountain Mine, just south of the BMM, was 28 acres. In December 1992, a Plan of Operations and Reclamation Permit Application were submitted by New Dynasty Mines (U.S.) Inc. The Plan of Operations was subsequently revised in March 1993 as part of the land package that included Dynasty Basin (SRK, 2008). The mine was later acquired by Placer Dome U.S. in 1993. Cessation of mining occurred in 1992, with heap rinsing on-going until 1995. The final permanent closure plan and design for the site was carried out in the summer of 1998 (SRK, 2004).

Golden Butte Mine

The Golden Butte Mine is located in Township 23 North, Range 61 East and consisted of an open pit and heap leach operation. The mine resulted in approximately 175 acres of disturbance; all disturbance except for approximately 20 acres of open pit has been reclaimed.

White Pine Mine

The White Pine Mine is an inactive, reclaimed mine located approximately five miles north of the Proposed Action boundary in portions of Sections 35 and 36, Township 25 North, Range 57 East. The mine includes a total of 274 acres of disturbance, including four open pits and three backfilled pits.

Socioeconomics-Specific Projects

The cumulative effects study area for socioeconomics encompasses Elko, Eureka, and White Pine counties, an area of approximately 30,000 square miles. It is not feasible to list every project that has contributed to social and economic conditions in the study area. However, major past projects in the area that should be mentioned. The Rain Mine, which is located approximately 10 miles southeast of Carlin, Nevada. The Rain Mine is no longer in operation and is currently being reclaimed. The Tonkin Springs Mine, which is located in the Simpson Park Mountains, was operated by U.S. Gold Corporation. The mine is no longer in operation.

Past Natural Processes within the Cumulative Effects Study Area

Wildland Fire

There have been several wildland fires within the cumulative effects study area and vicinity. Approximately 13,208 acres within the vegetation cumulative effects area and 13,097 acres within the wildlife cumulative effects area have burned within the last eight years.

Spread of Non-native Invasive Weeds

Non-native invasive weeds have been progressively spreading in the cumulative effects study area. The entire cumulative effects study area has not been formally surveyed for non-native invasive weeds that are not designated as noxious, so an estimated acreage cannot be determined.

Expansion of Pinyon and Juniper Trees and other Woody Species

Over the past 150 years, pinyon and juniper trees have spread into shrublands and grasslands and are expected to continue expansion.

Spread of Forest Insects and Diseases

Several years of drought in western states have resulted in severe stress on pinyon pines. Trees have become more susceptible to insect infestations.

Present Actions

BMM and Mooney Basin Operations Area

Present actions at BMM and the Mooney Basin Operations Area are described in Chapter 2 of this document. Current authorized disturbance is 4,165 acres; however, to date only 3,418 have been disturbed.

Oil and Gas Wells

Locations of the currently operating oil and gas wells and past notices for oil and gas wells are shown on Figure 4-1. Currently, there are five wells within the vicinity of the proposed project. Oil and gas wells are estimated to disturb approximately three acres each (Wilson, 2008).

BMM Regional Exploration Plan

BMM proposes up to 210 acres of exploration disturbance; however, only 70 acres would be disturbed at any one time based on reclamation bond limitations and requirements. Locations of drill sites and cross-country travel routes would be dependent on geological conditions and the results of ongoing drilling; thus BMM cannot predict where disturbance would occur. This exploration project is anticipated to occur through 2014 (SRK, 2008).

Little Bald Mountain Mining Project

Previous operations associated with the Little Bald Mountain Mining Project are described above. In January 2006, BMM submitted an Environmental Assessment (BLM, 2006c) for the Little Bald Mountain Mine Plan of Operations to the BLM, which was approved on December 13, 2006 (BLM, 2006c). The amendment allows for re-opening the existing portal for underground exploration activities, which involves disturbance of approximately one acre of previously disturbed/reclaimed land.

Little Bald Exploration Plan

The Little Bald Mountain Mine is the site of a small, permitted underground exploration operation. This operation has not yet begun. The project would result in 11 acres of disturbance.

Silver State Fiber Optic Line

The Silver State Fiber Optic Line is a communications line constructed parallel to the highway right-of-way between Salt Lake City, Utah, and Reno, Nevada. Within the cumulative effects study area, the line is located adjacent to U.S. Highway 50. The fiber optic line has a total permitted disturbance width of 25 feet (Sierra Pacific Power Company has a 10-foot right-of-way; AT&T has a 15-foot right-of-way width). Approximately 23 miles of the fiber optic line fall within the air, water, soils, non-native invasive species, and vegetation cumulative effects study areas.

Notices of Intent

Several hundred Notices of Intent have been filed over much of the project area and on lands to the south. Up to five acres of disturbance may occur under a notice, though actual disturbance would in many cases be less. The majority of these notices are closed, cancelled, expired, or withdrawn. Approximately 10 notices are active within the BLM Elko District Office portion of the cumulative effects study area. If it is assumed five acres of disturbance occurred under each notice, then approximately 50 acres of additional disturbance would occur.

Socioeconomics-Specific Projects

As mentioned previously, it is not feasible to list every project that contributes to social and economic conditions in the study area because it encompasses such a large area. Some of the larger projects in the study area include the Ruby Hill Mine, which is located west of the town of Eureka, Nevada, on private lands and lands administered by the BLM (BLM, 2005d). As mentioned above, the Tonkin Springs Mine is closed but additional exploration is taking place in and near the mine site. The Robinson Mine is an open pit copper and gold mine located approximately seven miles west of Ely, Nevada. The property was mined from the late 1800s to 1978 and then again from 1986 to 1999. The Robinson Mine recently reopened and is operated by Quadra Mining. Numerous other mines are in operation within the cumulative effects study area. The Elko County Railport is located six miles east of Elko, south of Interstate 80, and north of the Humboldt River along the Union Pacific rail line. At completion, the railport is estimated to produce up to 1,500 jobs in the Elko area (SPPCo, 2006).

United States Forest Service Fuel Treatment Project

USFS, Ruby Mountain Ranger District conducted a Fuel Treatment Project in the fall of 2008. The project was located on the west slopes of the Ruby Mountains generally located between Cherry Spring Canyon and Walker Canyon. The purpose of the project was to treat approximately 500 acres of pinyon/juniper encroachment into sagebrush communities on the southern end of the Ruby Mountains with prescribed fire and mechanical treatment. The project broke up fuel continuities and improved the quality of habitat in the project area for mule deer and other wildlife species. Burning occurred in the fall of 2008.

Present Natural Processes within the Cumulative Effects Study Area

Wildland Fires

Natural and human caused fires continue to be a threat to vegetation.

Spread of Non-native Invasive Weeds

Several species of non-native invasive weeds are found throughout the cumulative effects study area. These species are expected to continue to spread on both private and public lands throughout the cumulative effects study area.

Expansion of Pinyon and Juniper Trees and other Woody Species

Pinyon and juniper trees continue to expand into shrublands and grasslands.

Spread of Forest Insects and Diseases

Several years of drought in western states have resulted in severe stress on pinyon pines. Trees have become more susceptible to insect infestations.

Reasonably Foreseeable Future Actions

BMM North Operations Area Project (Proposed Action)

The Proposed Action is described in detail in Chapter 2 of this document. There would be a disturbance of approximately 3,920 acres with expansion of existing pits and waste rock dumps and process areas.

Alligator Ridge Mining Project

Mining may occur at the Alligator Ridge Mine in the future. Reasonably foreseeable mining-related disturbance is estimated at approximately 600 acres.

Midway Gold-Pan Mining Project

Midway Gold-Pan Mining Project is an exploration project south of U.S. Highway 50 that could develop into a 50-acre mine.

Limousine Butte Exploration Plan

The Limousine Butte Exploration Plan is located in the vicinity of Alta Gold's Golden Butte Mine, located in northern White Pine County. The exploration project proposed up to 88 acres of disturbance occurring within a 27,000-acre plan area.

Yankee Mine

The Yankee Mine is currently reclaimed and in closure; however, a 143-hole exploration program is proposed for the area. Mining may occur at the Yankee Mine in the future. Reasonably foreseeable mining disturbance is estimated at approximately 400 acres.

Wind Energy Projects

Based on current interest in wind energy development, it is projected by the BLM that three 200-megawatt wind farms would be developed during the next 20 years somewhere within the cumulative effects study areas. Based on information in the Draft Ely Resource Management Plan/EIS (BLM, 2005c), each wind farm is assumed to have approximately 340 acres of permanent disturbance. Assuming three wind farms would be developed, this action would have approximately 1,020 acres of disturbance. Disturbance would largely occur along mountain ridgelines.

Oil and Gas Wells
Reasonably foreseeable oil and gas well exploration (estimated at five wells) is expected to occur in the future (Wilson, 2007).

Socioeconomics-Specific Projects
As mentioned previously, it is not feasible to list every reasonably foreseeable project that could contribute to social and economic conditions in the study area because it encompasses such a large area. Larger future actions in the study area include the Mount Hope Mine, a proposed molybdenum mine northwest of Eureka, Nevada, with an estimated 53-year mine life. The White Pine Energy Station is a proposed coal-fired electric power generating plant that would be constructed on a 1,300-acre site in Steptoe Valley north of Ely. The White Pine Energy Station would include two 500- to 800-megawatt power generation units with a total combined electrical capacity ranging from 500 megawatts to 1,600 megawatts. The project life is expected to be 40 years or longer. The Ely Energy Center is a NV Energy proposed coal-fired power generation facility to be located north of Ely. When fully built out, the project would have a total generating capacity of 2,500 megawatts. Newmont Mining Corporation has submitted a DEIS for the Emigrant Project, which is located approximately 10 miles south of Carlin, Nevada, on both public and private land and would consist of an open pit mine, waste rock disposal facilities, an oxide leach facility, borrow material areas, haul roads, and exploration activities (BLM, 2005e). Other noteworthy projects include the White Pine County Airport expansion, the Egan Range Wind Generating Project, and the Clark, Lincoln, and White Pine counties groundwater development project proposed by the Southern Nevada Water Authority.

Reasonably Foreseeable Natural Processes within the Cumulative Effects Study Area
Wildland Fire
The area burned by wildland fire would continue to vary greatly from year to year.

Spread of Non-native Invasive Weeds
Several species of non-native invasive species are found throughout the cumulative effects study area. These species are expected to continue to spread on both private and public lands throughout the cumulative effects study area.

Expansion of Pinyon and Juniper Trees and Other Woody Species
Over the past 150 years, pinyon and juniper trees have spread into shrublands and grasslands and are expected to continue expansion.

Spread of Forest Insects and Diseases
Several years of drought in western states have resulted in severe stress on pinyon pines. Trees have become more susceptible to insect infestations.

4.1.3 General Assumptions for Cumulative Impact Analysis
The following are general assumptions made for all resources in the cumulative impacts analysis:

- Analysis is based on the assumption that all interrelated projects are approved and completed as projected;

- Analysis is based on a time frame for Proposed Action reclamation activities to be completed 13 years after mining activities cease.
- Based on information in the Draft Ely Resource Management Plan/EIS (BLM, 2005c), each wind farm is assumed to have approximately 340 acres of permanent disturbance.

If applicable, other resource-specific assumptions are included at the beginning of each resource section. If none are included, only the general assumptions apply.

4.2 Water Resources

The affected environment for water resources within and directly surrounding the project area is discussed in Section 3.2. Since the cumulative effects study area for water resources is much larger than the Proposed Action boundary, additional information on the area is included herein. The cumulative effects study area comprises four hydrographic basins: Huntington, Ruby, Long, and Newark valleys (Figure 4-1). Ruby, Long, and Newark valleys are topographically closed basins, while Huntington Valley drains north into the Humboldt River. Ruby and Huntington valleys are designated groundwater basins, and Long and Newark valleys are undesignated groundwater basins. The surface water within these basins consists primarily of springs and ephemeral drainages. There are minor amounts of perennial surface water (e.g., Ruby Lake and Marshes, Huntington Creek, and Newark Lake); however, most surface water either evaporates or infiltrates at some point along its flow path.

4.2.1 Assumptions for Analysis

Surface Water and Groundwater

Assumptions for analysis for the cumulative effects to surface water and groundwater are the same as indicated in Chapter 3.

4.2.2 Geographic Area for Analysis

Surface Water

The cumulative effects study area for surface water resources encompasses four hydrographic basins: in the Humboldt River Basin Region, Huntington Valley Basin (Basin Number 47), and, in the Central Region, Newark Valley Basin (154), Long Valley Basin (175), and Ruby Valley Basin (176). The cumulative effects study area for water resources incorporates natural watershed boundaries associated with the Proposed Action (Figure 4-1). The four basins cover an area of approximately 2,070,965 acres.

Surface water in Ruby Valley drains to Ruby and Franklin lakes. Surface water in Long Valley drains toward a small playa in the center of the valley. The majority of surface water in Long Valley infiltrates or evaporates prior to reaching the playa. Surface water in Newark Valley drains to Newark Lake. Surface water in Huntington Valley drains to Huntington Creek, which then drains into the South Fork of the Humboldt River. Huntington Creek is considered a perennial drainage. Ruby Lake and Newark Lake have water year-round, largely due to localized springs that are adjacent to the lakes. There are limited perennial surface water features in Long Valley, with the majority of Long Valley dry by the end of the summer. The seeps and springs within the general project vicinity are discussed in Section 3.2.

Groundwater

The cumulative effects study area for groundwater resources encompasses the same four hydrographic basins as described above for surface water: in the Humboldt River Basin Region, Huntington Valley Basin (Basin Number 47), and, in the Central Region, Newark Valley Basin (154), Long Valley Basin (175), and Ruby Valley Basin (176). These four basins cover an area of approximately 2,070,965 acres. The cumulative effects study area for water resources incorporates natural watershed boundaries associated with the proposed project.

Drinking Water
The cumulative effects study area for drinking water is the same as the study area for both surface water and groundwater.

4.2.3 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Surface Water
Potential cumulative effects to surface water resources within the cumulative effects study area could occur from mining operations and exploration activities, oil and gas exploration, fuel treatment projects, livestock grazing, and projects having direct surface disturbance. Projects located within the water resources cumulative effects study area are discussed in Section 4.1.2 and summarized in Table 4-1.

In general, all projects within the cumulative effects study area involving surface disturbance have the potential to impact surface water quality and quantity, primarily through increased sedimentation as a result of the removal of vegetation and disturbance to the soil structure. All authorized past, present, proposed, and reasonably foreseeable future actions in the cumulative effects study area that have associated surface distance and are located on public lands would be required to implement Best Management Practices (Appendix D), which are part of the BLM Ely District Resource Management Plan. Use of Best Management Practices would help to stabilize soils and reduce sedimentation to surface waters in the cumulative effects study area. Impacts from all actions identified in the cumulative effects study area are anticipated to be limited to the life of each project and the localized nature of each project.

Due to the limited surface water resources in the Proposed Action area compared with other areas of the cumulative effects study area and to the minimal impact to surface water from the Proposed Action with implementation of Best Management Practices developed by the BLM (Appendix D) and Design Features selected by Barrick (Table 2-13), the Proposed Action would have only a limited impact on surface water quality or quantity within the cumulative effects study area.

Groundwater
The impacts to groundwater resources directly associated with the Proposed Action are discussed in Section 3.2. Potential cumulative effects to groundwater resources within the cumulative effects study area could occur from mining operations and exploration activities, oil and gas exploration, and any other projects where the groundwater is intercepted. Projects located within the water resources cumulative effects study area are discussed in Section 4.1.2 and summarized in Table 4-1.

Past and present mining and mineral exploration activities in the cumulative effects study area have disturbed approximately 6,472 acres. This disturbance includes existing mines and exploration disturbance and Notices of Intent, as well as existing gravel pits. Other past and present actions within the water resources cumulative effects study area include utilities and road disturbances (approximately 1,345 acres). Since the power lines and roads do not intercept the water table, there have been no known impacts to groundwater from these projects. Reasonably foreseeable future mining actions include disturbance of approximately 4,970 acres which includes the 3,920 acres of disturbance from the Proposed Action. Mining operations would require use of groundwater for processing operations and may intercept groundwater during open pit mining. Other reasonably foreseeable future actions within the water resources cumulative effects study area include wind energy projects. These projects would disturb approximately 1,020 acres. The power lines, roads, and wind energy projects do not intercept the water table and are therefore not anticipated to impact the groundwater resources.

A concern has been raised regarding the impact on the Ruby Lake National Wildlife Refuge of the increased groundwater production from the Mooney Basin wells associated with the Proposed Action. Impacts to the Ruby Lake National Wildlife Refuge are not anticipated (Osterberg, 2007), primarily due to the fact that the Mooney Basin wells are located in Newark Valley and are not within Ruby Valley. Ruby Valley is a designated basin, while Newark Valley is an undesignated basin. The sources of recharge for the Ruby Lake National Wildlife Refuge and for the Mooney Basin wells are different. Between 1999 and 2003, the U.S. Geological Survey conducted a study of the hydrogeology and water resources of Ruby Valley (USGS, 2005a). The report states that the major sources of recharge to the Ruby Lake National Wildlife Refuge are the springs discharging directly west of the lake. These springs are fed by precipitation in the mountains to the west. The carbonate rocks transmit the water down-slope to the east where they discharge as springs along a localized fault system at the base of the mountains. The U.S. Geological Survey report states that there is no measurable component of recharge to the Ruby Valley from the south. According to the report, the area to the south and east are theorized as actual discharge points for the groundwater from Ruby Valley.

Current activities impacting groundwater quality and quantity include irrigation in all four hydrographic basins but primarily in Huntington and Ruby valleys. Irrigation is the primary use of groundwater in both Huntington and Ruby valleys. The Proposed Action is not projected to impact groundwater quality or quantities in Ruby Valley; thus no cumulative impacts to groundwater in that valley would occur. Cumulative impacts associated with Huntington Valley, where under the Proposed Action additional groundwater would be withdrawn, are expected to be minimal because there are no other groundwater users within five miles of the existing groundwater wells and the aquifer utilized for existing BMM wells is a large, unconfined alluvial system. In addition, no significant decreases in the groundwater levels have been observed at the BMM wells since they were drilled, and the calculated zones of depression, based on the assumptions in Section 4.2.1, do not impact any other water users.

The level of impacts from the current BMM and Mooney Basin Operations Area are discussed in Section 3.2. The impacts to groundwater due to mining from other identified projects are not known at this time as many of these projects are still in the exploration and planning phases and may or may not go forward toward development. If other mining projects do proceed to the operation phase, additional groundwater resources would be used. This would result in impacts to the basin from which the groundwater is withdrawn. It is likely that groundwater use from additional mining projects would occur in the two undesignated basins of Long Valley and Newark Valley and that these other operations would be smaller than the Proposed Action, thus requiring less water for operations. The proposed withdrawal rate of 550 acre-feet per year combined with the additional use from these mining operations would result in minimal cumulative impacts to the groundwater quality since the foreseeable mining operations are much smaller than the Proposed Action.

NEPA compliance would be required for all proposed future actions, and NEPA compliance would address direct, indirect, and cumulative impacts to groundwater quality and quantity. All future mining operations would also be required to comply with state and federal regulations; therefore, impacts from contaminants to groundwater quality would not be likely to occur. Increases in groundwater pumping, in addition to what is proposed by BMM, are unknown at this time.

4.2.4 Cumulative Impacts Conclusion

Surface Water

Based on current knowledge of projects within the water resources cumulative effects study area, the cumulative impact to seeps and springs would be minimal with the addition of the Proposed Action. Most of the impacts to seeps or springs by past, present, and future actions would be localized to disturbed areas and limited to the life of each project. Most projects are required to follow Best Management Practices developed by state, federal, and private companies so impacts to surface water from past, present, and reasonably foreseeable actions would be minimized with the use of Best Management Practices.

Groundwater

Cumulative effects to groundwater in the cumulative effects study area would consist of increased groundwater withdrawals from wells. Effects from wind energy projects, power line projects, or fuels treatment projects would be negligible since they would not intercept the water table. Surface disturbance actions within the cumulative effects study area are listed in Table 4-1. Minimal cumulative impacts to the groundwater are anticipated.

4.2.5 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

Surface Water

Alternative A would decrease disturbance associated with the BMM since some of the waste rock would be placed in the open pits. Cumulative impacts to surface water resources would be reduced since there would be less surface disturbance and less potential for surface erosion. Cumulative impacts associated with Alternative B would be the same as with the Proposed Action. The movement of the heap leach pad would have no varying impacts on the surface water resources. Under the No Action Alternative, cumulative impacts to the cumulative effects study area would not exceed those already authorized.

Groundwater

Alternative A would decrease disturbance associated with the BMM since some of the waste rock would be placed in the open pits. Cumulative impacts to groundwater resources would be the same as with the Proposed Action since the level of production would remain the same. Under Alternative B, movement of the heap leach pad would result in a larger amount of ore being processed at the 2/3 Heap Leach Pad Since the Mooney Basin Heap Leach Pad is located in Long Valley, cumulative impacts to groundwater resources in Long Valley would be less under Alterative B. Cumulative impacts under the No Action Alternative would not exceed those already authorized.

4.3 Geology and Minerals

4.3.1 Geographic Area for Analysis

The cumulative effects study area for the geology and minerals resource is shown in Figure 4-1 and includes the southern end of the Ruby Mountains. The cumulative effects study area was chosen to represent the local geologic environment. The southern Ruby Mountains were chosen because the geology is very similar throughout. The valleys were chosen to be the boundaries because Basin and Range faulting has created a significant change in the geology visible at the surface and in the areas below the surface that would be impacted by the Proposed Action and the other included projects. The geologic setting is discussed in Section 3.3. The geology and minerals resource cumulative effects study area includes approximately 199,258 acres.

4.3.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Past projects within the geology and minerals cumulative effects study area have disturbed approximately 1,568 acres, and present projects within the cumulative effects study area boundary have disturbed approximately 4,435 acres (Table 4-1). Reasonably foreseeable future actions are expected to disturb approximately 4,923 acres. Future actions include the Proposed Action, wind energy projects, Alligator Ridge Mine, Yankee Mine, and oil and gas wells. The only projects anticipated having impacts to the geology and minerals are the mining and oil and gas projects. The other projects are not anticipated to impact geologic and mineral resources.

The contribution of the Proposed Action to cumulative effects on geology and mineral resources would be the removal of approximately 200 million tons of ore and 830 million tons of waste rock. Waste rock would be placed in areas where it would not impede future access to mineral resources. The other foreseeable future mining projects are small in comparison with the Proposed Action. The foreseeable future actions operated by Barrick are currently in exploration, and the amounts of ore and waste to be mined are not known at this time. Future oil and gas wells would impact geology by removing oil and gas resources but would not affect precious metals resources.

4.3.3 Cumulative Impacts Conclusion

The cumulative effects anticipated in the cumulative effects study area for geology and minerals would be the removal of ore resources. The Proposed Action would add cumulatively to the ore being removed throughout the cumulative effects area and would contribute to the location and possible extraction of additional ore resources in the future.

4.3.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

Alternative A would involve partial backfilling of up to six open pits. This would lead to less surface disturbance and the potential to limit future access to economic resources. The proposed pit configurations are based on current market conditions. Future market conditions may make it possible to process ore that is currently not profitable. By backfilling the pits, the ore would be unavailable for future mining without significant expense. Alternative B would require processing of some of the ore at another location. The extent of mining would be the same, and the cumulative impacts to the geologic and minerals resources would also be the same. Under the No Action Alternative, mining would end in 2009 and there would be no impacts other than those already authorized.

4.4 Paleontology

4.4.1 Geographic Area for Analysis

The cumulative effects study area for paleontology is the same as the cumulative effects study area for geology since the paleontological resources are linked to certain geologic formations.

4.4.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Fossils associated with the cumulative effects study area are abundant, and none have been classified as rare or important. Contingency measures to be implemented in the event of unexpected discoveries of potentially valuable paleontological resources in the Proposed Action area are contained in Section 3.4. The Proposed Action, past, present, and foreseeable future actions are therefore unlikely to contribute to cumulative impacts to paleontological resources.

4.4.3 Cumulative Impacts Conclusion

Because no rare and important paleontological resources are known to be present in the Proposed Action area, and because contingency plans are in place in the event that any are discovered, the actions are not likely to contribute to cumulative impacts to paleontological resources.

4.4.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be a slight reduction in the potential to impact paleontological resources under the two action alternatives because of less ground disturbance. Under the No Action Alternative there would be no impacts other than those already authorized.

4.5 Soils

4.5.1 Geographic Area for Analysis

The cumulative effects study area boundary for soil resources is 2,070,965 acres and encompasses four hydrographic basins, as described in Section 4.2. Based on Natural Resources Conservation Service Soil Surveys, approximately 400 soil associations occur within western White Pine County, approximately 500 soil associations occur within Elko County, and approximately 370 associations occur within the soil resource cumulative effects study area. The physical and chemical properties of the soils that occur within the cumulative effects study area boundary are discussed in detail in the Soil Surveys of White Pine and Elko counties. The location and extent of each soil association is illustrated on the orthographic base maps included in the soil surveys.

4.5.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

As shown in Table 4-1, ground disturbance within the soils cumulative effects study area from past actions total 2,800 acres, the impact from present actions totals 5,017 acres, and the impact from reasonably foreseeable future actions totals 6,005 acres. Many of the past projects are in various stages of reclamation; present and reasonably foreseeable future project disturbance is also likely to be reclaimed in full or in part. Natural processes that could impact soil resources within the cumulative effects study area include wildland fire, the spread of forest insects and diseases, and the spread of non-native invasive weeds. Past wildland fire activities has impacted approximately 13,208 acres or 0.6 percent of the cumulative effects study area.

Ground disturbance can affect soils by removing them from productive use as a result of burying or excavating them and by altering infiltration and erosion as a result of compaction or changes in topography. Disturbed soils can increase both wind and water erosion and are more susceptible to establishment of non-native invasive weeds. These potential impacts can be reduced by reclaiming disturbed areas and restoring them to productive use. The Proposed Action would contribute to cumulative effects on soils by disturbing approximately 3,920 acres. Impacts would be minimized by stockpiling soil and reclaiming disturbed areas as discussed in Chapter 2.

There is the potential for process chemicals, fuel, and waste materials to be accidentally released during transport within the cumulative assessment area, resulting in a cumulative impact to soils. The probability and impacts of such a release is discussed in Section 4.19.

4.5.3 Cumulative Impacts Conclusion

Existing, proposed, and reasonably foreseeable actions within the cumulative impacts area total approximately 13,822 acres of disturbance, or about 0.7 percent of the analysis area. Additional impacts to soils have occurred as a result of natural processes that are likely to continue into the future. The Proposed Action would add to cumulative impacts by disturbing approximately 3,920 acres; however, disturbed soils would be reclaimed in most cases of permitted projects unless permanent structures and developments occur. Over time, disturbed soils from natural events such as fires will recover and become productive. Cumulative impacts to soils would be minimal.

4.5.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

Alternative A would reduce disturbance by approximately 434 acres and Alternative B would reduce disturbance by approximately 105 acres compared with the Proposed Action, resulting in a proportional decrease in impacts to soils. Under the No Action Alternative there would be no contribution to cumulative impacts to soils other than those previously authorized.

4.6 Vegetation Resources

4.6.1 Geographic Area for Analysis

The cumulative effects study area boundary for vegetation resources encompasses the four hydrographic basins as identified under the water resources and soil cumulative effects study areas. Watershed boundaries are appropriate to use because watersheds can influence regional vegetation. In addition, the BLM Ely District currently manages resources by watershed.

Plant and soil interrelationships are such that characteristics of one would intimately affect the characteristics of the other (i.e., composition and structure) over time. This being the case, they should be treated at the same scale. Therefore, the same boundary is used for both vegetation and soils cumulative effects study areas.

The cumulative effects study area for vegetation includes approximately 2,070,965 acres. Impacts to vegetation within the cumulative effects study area result from mining, other industrial activities, increased traffic, maintenance of existing roads, grazing, and wildland fires.

The information used to compile vegetation communities within the cumulative effects study area was taken from data collected for the Southwest Regional Gap Analysis Program (USGS, 2005b). The gap data were broken down into several detailed community types. For this analysis, the gap community types were grouped into the 11 community types listed below and in Table 4-3. Gap data were also used to compile invasive and non-native species and are discussed in Section 4.7.3.

The pinyon-juniper woodland community, big sagebrush community, and low sagebrush community (combined here as the sagebrush community) and the mountain brush community are discussed in Section 3.6, and the wetland/riparian community is discussed in Section 3.9. The largest vegetation community components of the cumulative effects study area are the pinyon-juniper community (16.0 percent) and the sagebrush community (60.5 percent) (Table 4-3).

The conifer woodland vegetation community type typically occurs between 4,000 and 12,000 feet above mean sea level. This vegetation community type can consist of a mixture of limber pine (*Pinus flexilis*), lodgepole pine (*Pinus contorta*), ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), aspen (*Populus tremuloides*), fir (*Abies* spp.), spruce (*Picea* spp.), pinyon pine (*Pinus monophylla)*, and juniper (*Juniperus osteosperma)* in the overstory. Common understory plants include serviceberry (*Amelanchier alnifolia*), chokecherry

(*Prunus virginiana)*, snowberry (*Symphoricarpos albus),* Woods' rose (*Rosa woodsii*), blue wildrye (*Elymus glaucus*), bluegrass (*Poa* sp.), needlegrass (*Achnatherum* spp.), needle and thread grass (*Hesperostipa comata*), yarrow (*Achillea millefolium*), and aster (*Aster* spp.)

TABLE 4-3 VEGETATION COMMUNITY TYPES WITHIN THE CUMULATIVE EFFECTS STUDY AREA

CATEGORY	ACREAGE WITHIN THE CUMULATIVE EFFECTS STUDY AREA	PERCENT OF CUMULATIVE EFFECTS STUDY AREA
Conifer woodland	34,090	1.6
Pinyon/Juniper Woodland	329,994	16.0
Mountain Brush	15,463	0.4
Sagebrush	1,253,349	60.5
Desert scrub	242,652	11.9
Grasslands	52,122	2.5
Riparian/Wetland/Meadow*	36,028	1.7
Agriculture	8,343	0.4
Non-Native Invasive Species	52,145	2.5
Water	2,491	0.4
Barren	44,288	2.1
Total	**2,070,965**	**100**

* Discussed further in Section 4.9.

The mountain brush vegetation type typically occurs between 2,000 and 9,000 feet above mean sea level. This vegetation community type includes woodlands and shrublands dominated by mountain mahogany (*Cercocarpus ledifolius*), mountain big sagebrush, and antelope bitterbrush (*Purshia tridentata).* Other species common within this vegetation type include manzanita (*Arctostaphylos*), currant (*Ribes*), snowberry, and scattered pinyon and juniper.

The desert scrub community type is found at elevations between 5,900 and 6,400 feet above mean sea level. Dominant plants found within this community include rabbitbrush (*Chrysothamnus nauseosus*), iodinebush (*Allenrolfea occidentalis*), shadscale (*Atriplex confertifolia*), black greasewood (*Sarcobatus vermiculatus),* alkali sacaton (*Sporobolus airoides*), inland saltgrass (*Distichlis spicata*), winterfat (*Ceratoides lanata*), bud sagebrush (*Artemisia spinescens*), black sagebrush (*Artemisia arbuscula,* var. *nova*), ephedra (*Ephedra nevadensis*), fourwing saltbush (*Atriplex canescens*), snakeweed (*Gutierrezia sarothrae*), Indian ricegrass (*Oryzopsis hymenoides*), bottlebrush squirreltail, Sandberg's bluegrass, needle and thread grass, buckwheat, phlox (*Phlox*), and globemallow (*Sphaeralcea* sp.). Winterfat can be dominant in this community type.

The grassland vegetation type typically occurs at elevations of 4,750 to 7,600 feet. This vegetation type is dominated by perennial bunchgrasses and drought-resistant shrubs. Indian ricegrass and needle and thread grass are the dominant species with scattered shrubs such as sagebrush, shadscale, snakeweed, winterfat, and ephedra species also present (USGS, 2005).

The agriculture community type includes all land being actively tilled, pasture land, areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, and areas used for the production of annual crops (USGS, 2005b).

The non-native invasive species vegetation type includes areas that are dominated by introduced annual and/or biennial grass and forb species such as halogeton (*Halogeton glomeratus*), kochia (*Kochia scoparia*), Russian thistle, cheatgrass, Canada thistle, bull thistle, pepperweed (*Lepidium* spp.), and Scotch thistle (USGS, 2005b). Non-native invasive species are discussed further in Section 4.7.

Water areas are covered or inundated with standing water with less than 25 percent cover by soil or vegetation (USGS, 2005b).

Barren areas are dominated by bare ground with less than 10 percent vegetative cover. Barren areas within the cumulative effects study area include bedrock, scree, cliffs, washes, playas, sand dunes, and mined and quarried areas (USGS, 2005b).

4.6.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

The great majority of interrelated projects in Table 4-1 have associated ground disturbance that would impact vegetation. The combination of the Proposed Action as well as past, present, and reasonably foreseeable future actions would impact a total of 13,822 acres (or 0.7 percent) of vegetation community types within the cumulative effects study area. The majority of the area disturbed would be revegetated once the projects have been completed, and a portion of past disturbance has already been successfully revegetated. However, these areas are not always revegetated with the same species that were previously established, possibly changing the number and diversity of plant species. Some vegetation community types such as pinyon-juniper woodland could take decades to recover, or they may be permanently changed to other community types such as sagebrush or grassland.

Wildland fires have burned approximately 13,208 acres within the vegetation cumulative effects study area in the last eight years. This represents approximately 0.6 percent of the vegetation cumulative effects study area. Exacerbating the problem is that burned areas typically are invaded by non-native invasive species that can alter the fire regime. The trend appears to be toward increasing numbers of fires of greater intensity.

The Proposed Action would contribute to cumulative effects on vegetation, mainly by disturbance of up to 3,920 acres. Most of this disturbance would be temporary because all but the pit expansions would be reclaimed. Projects on public land generally incorporate measures to identify special status species and avoid or mitigate impacts to the extent possible. Because the Proposed Action would not impact any special status species or potential habitat, no contribution to cumulative impacts on special status species is anticipated.

4.6.3 Cumulative Impacts Conclusion

Impacts from past, present, and reasonably foreseeable future activities within the cumulative effects study area including the Proposed Action would be a loss of vegetation during disturbance and a potential increase in non-native invasive species as discussed in Section 4.7. The described past, present, and reasonably foreseeable future activities would impact approximately 0.7 percent of the vegetation within the cumulative effects study area. The majority of this land would be reclaimed, resulting in reduced cumulative impacts to vegetation. Reclaimed areas would differ in species composition for a number or years, and sometimes permanently as compared with initial conditions.

4.6.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be only minor differences in cumulative effects to vegetation under either of the two action alternatives because of the small reduction in ground disturbance. There would be no contribution to cumulative effects under the No Action Alternative other than those already authorized.

4.7 Non-Native Invasive Species

4.7.1 Geographic Area for Analysis

The non-native invasive species cumulative effects study area, which shares the same boundary as vegetation resources, includes the four hydrographic basins surrounding the project area. Weeds do not stop at fence lines, at property lines, at county borders, or when the soil type changes. Weeds move along several vectors, the most common ones being roads, human activity, and water flow. The boundaries of the watersheds encompass these vectors around the project area, and the likelihood of non-native invasive species moving outside of those boundaries is more limited.

4.7.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Land-disturbing and transportation activities within the cumulative effects study area that can increase chances of spreading existing non-native invasive species (including noxious weeds) populations include mining and other ground-disturbing activities, increased traffic, maintenance of existing roads, grazing, recreation, and wildland fires (Table 4-1). Previously disturbed areas within the cumulative effects study area create the potential for non-native invasive species to spread. Noxious weed species in the cumulative effects study area are found along roadways, drainages, and disturbed areas. The distribution of non-native invasive species around the Proposed Action area is shown in Figure 3-11. Non-native invasive and noxious weed species mapped within the cumulative effects study area include black henbane, bull thistle, Canada thistle, hoary cress, leafy spurge (*Euphorbia esula*), musk thistle, poison hemlock (*Conium maculatum*), Russian knapweed (*Acroptilon repens*), salt cedar (*Tamarix* spp.), Scotch thistle, spotted knapweed, diffuse knapweed (*Centaurea diffusa*), tall whitetop (*Lepidium latifolium*), and water hemlock (*Cicuta maculata*). Other non-native invasive species that probably occur within the cumulative effects study area that have not been mapped include halogeton, kochia, Russian thistle, and cheatgrass. Approximately 52,145 acres, or 2.5 percent, of the cumulative effects study area contain some level of non-native invasive species infestation to the extent that they were identifiable in the gap information (USGS, 2005b).

Impacts from past activities have facilitated the spread of noxious species, especially along transportation routes, drainages, and disturbed areas. Because many activities that occur within the cumulative effects study area do not implement an invasive and non-native noxious weed management plan, establishment of these species is likely to continue in the watersheds.

Impacts from other non-native invasive species would be realized through the Proposed Action and other interrelated action within the cumulative effects study area. These species, such as cheatgrass, readily establish in disturbed and burned areas. Past disturbed and burned areas throughout the cumulative effects study area have created an opportunity for these invasive species to spread.

4.7.3 Cumulative Impacts Conclusion

Establishment of non-native, invasive species would likely occur under the Proposed Action and other interrelated projects. However, the spread of noxious weeds would be minimized through Best Management Practices required for most permitted activities.

These impacts would be realized through the spread of invasive species due to an increase in transportation from project areas, combined with recreation and other activities within the cumulative effects study area. Natural processes such as wildland fire have the potential to disturb large areas, contributing to the opportunity for new non-native invasive species infestations throughout the burned areas. Any increase in human activity within a region will usually result in the opportunity to spread noxious weeds. However, there is also an increased awareness to implement Best Management Practices and reclamation criteria to control their spread which can help minimize the cumulative effect.

4.7.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be only inconsequential differences in cumulative effects from non-native invasive species under either of the two action alternatives. The No Action Alternative would reduce potential total disturbance by 3,920 acres, thereby reducing the area susceptible to non-native invasive species invasion.

4.8 Wildlife, Migratory Birds, and Special Status Animal Species

4.8.1 Geographic Area for Analysis

The cumulative effects study area for wildlife, migratory birds, and special status animals encompasses NDOW Big Game Hunt Units 102, 103, and 108 of Management Area 10. These units include migration corridors and winter range areas for mule deer and habitat for elk that could be affected by the project. The area also includes portions of the hydrographic basin that encompasses the Ruby Lake National Wildlife Refuge. The wildlife cumulative effects study area encompasses approximately 1,794,903 acres (Figure 4-1).

4.8.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

As shown in Table 4-1, ground disturbance within the wildlife cumulative effects study area from past actions is 2,890 acres; the impacts from present actions is 4,941 acres; and the impacts from reasonably foreseeable future actions is 4,929 acres. The total disturbance from these projects (12,760 acres) is less than one percent of the study area. The wildlife habitats affected are those typically found at low to middle elevations, mainly a mix of big sagebrush and pinyon-juniper vegetation types. Many of the past projects are in various stages of reclamation; present and reasonably foreseeable future project disturbance is also likely to be reclaimed in full or in part. Natural processes that could impact wildlife resources within the cumulative effects study area include wildland fire, the spread of forest insects and diseases, pinyon and juniper encroachment into sagebrush habitats, and the spread of non-native invasive weeds.

Wildland fires have affected approximately 13,097 acres (0.7 percent) of the wildlife study area in the past eight years. Fires have occurred in the northwestern and northeastern portions of the project area and lands north of Cherry Spring. Affected habitats include pinyon-juniper woodland and smaller amounts of big sagebrush.

It could take decades for disturbed pinyon-juniper woodland habitat to be restored to pre-disturbance condition, a process that is uncertain because it can be altered by management actions, fire, and other factors. Reclamation would initially establish shrubland and grass habitats that could benefit mule deer, sage-grouse, sage thrashers, and Brewer's sparrows. Other species such as juniper titmice, blue-gray gnatcatchers, plumbeous vireos, and black-throated gray warblers would be affected by the loss of pinyon-juniper woodland. In addition to loss of habitat, past, present, and reasonably foreseeable future actions could affect wildlife species by displacement because of the presence of humans, direct mortality from vehicle collisions, and interference with migration routes.

Potential impacts of the Proposed Action to wildlife, migratory birds, and special status species are discussed in detail in Section 3.8. The primary contribution of the Proposed Action to cumulative effects would result from disturbing approximately 3,920 acres of sagebrush and pinyon-juniper habitat. Not all of this area would be disturbed at one time, and reclamation would be implemented in stages, reducing the potential impact. The reclamation process would likely result in at least a temporary change in plant species composition, particularly in the case of pinyon-juniper woodland. The proposed disturbance is a small proportion of the study area, and vast amounts of similar wildlife habitat would remain on adjacent public land.

Projects on public land generally incorporate measures to prevent the destruction of active migratory bird nests, eggs, and/or young. Under the Proposed Action these impacts would be avoided by performing land-clearing activities outside of the avian breeding season. In the event that surface disturbance must take place during the avian breeding season, a qualified wildlife biologist would survey the areas of proposed disturbance immediately prior to the disturbance. Consistent with current practice, if active nests or evidence of nesting is found or observed, a buffer zone would be established around the nest area to prevent the destruction or disturbance of nests until young have fledged. The Proposed Action would therefore have a minimal impact on migratory birds.

The increase in traffic to and from the mine by employees and deliveries of materials and equipment could have cumulative impacts on wildlife by increasing the risk of injury and mortality by collisions with vehicles. In addition, the Proposed Action could interfere with wildlife migration, particularly mule deer. Proposed Design Features described Table 2-13 would minimize this potential impact.

The contribution of the Proposed Action to cumulative impacts on special status species would be minimal, as described in Section 3.8.6.

4.8.3 Cumulative Impacts Conclusion

Cumulative impacts to wildlife, including migratory birds, and special status species, occur primarily through the disruption of habitat. Many of the projects would have a temporary impact that would last until the disturbed land has been reclaimed. Cumulative impacts would result from the presence of humans, potential interference with migratory movements, and the increased risk of injury and mortality from vehicle collisions. The change in cumulative impacts to wildlife with the addition of the Proposed Action is small, especially since state and federal permitted activities within the cumulative effects area are required to minimize and mitigate any potential effects.

4.8.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

The Partial Backfill Alternative would reduce impacts resulting from the Proposed Action by approximately 434 acres (less than 1 percent of the wildlife cumulative effects study area). This would be a minor decrease in loss of habitat and the amount of wildlife displacement that could occur. The Mooney Basin Heap Leach Pad Alternative would reduce impacts by approximately 105 acres compared with the Proposed Action. Under the No Action Alternative there would be no contribution to cumulative effects other than those already authorized.

4.9 Wetlands, Riparian Zones, Waters of the U.S.

4.9.1 Assumptions for Analysis

The following assumption is made for analysis for the cumulative effects to wetland, riparian zones, and waters of the U.S.:

- The U.S. Army Corps of Engineers would concur with the findings of the waters of the U.S. delineation, which found that drainages in the project area are isolated and do not share a significant commerce connection with identified waters of the U.S. (JBR, 2008).

4.9.2 Geographic Area for Analysis

The 2,070,965-acre cumulative effects study area for wetlands, riparian zones, and waters of the U.S. is the same as that for water resources and was chosen for the same reasons as those provided in Section 4.2.2.

Wetlands and riparian zones are limited and represent important habitats in the xeric environment of the Great Basin. Few wetlands (none of which are under the jurisdiction of the U.S. Army Corps of Engineers) and no riparian areas are found in the Proposed Action area, but large wetland areas exist at the Ruby Lake Marshes in Ruby Valley, northeast of the Proposed Action area. Relatively large wetland and open water areas also exist in Newark Valley southwest of the Proposed Action area. Huntington Creek is a perennial stream located northwest of the Proposed Action area. Long Valley, to the southeast, supports limited areas of perennial waters or riparian areas (a short reach of Long Valley Slough, east of Long Valley Road, is mapped as a perennial water). Tetra Tech (2007) surveyed springs in and near the survey area and farther south in the Ruby Mountains. These surveys included sites along the west edge of the Ruby Mountains in eastern Newark Valley, two springs on the western side of Newark Valley, and several springs east of the project area in the Maverick Springs Range. While not included in the Tetra Tech surveys, a number of springs, some supporting perennial streams, are located farther north in the Ruby Mountains, north of Overland Pass.

4.9.3 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Most of the interrelated actions in the cumulative effects study area are either fully or partially on public land. In recognition of the special value of streams and wetlands, land use authorizations for such projects typically include measures to identify, avoid, and mitigate impacts to wetlands, riparian areas, and waters of the U.S. The Proposed Action would not contribute to cumulative effects on wetlands because disturbance to the few wetlands in the Proposed Action area would be avoided.

4.9.4 Cumulative Impacts Conclusion

The Proposed Action would not contribute to cumulative impacts on wetlands, riparian zones, or waters of the U.S. Future actions might have the potential to impact wetlands, riparian zones, or waters of the U.S.; however, these actions cannot be quantified due to the lack of descriptive data for each project. All future projects on public lands would be evaluated on an individual basis.

4.9.5 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be no impact to wetlands, riparian zones, or waters of the U.S under either of the action alternatives. Under the No Action Alternative there would be no impacts other than those already authorized.

4.10 Range Resources

4.10.1 Geographic Area for Analysis

The cumulative effects study area for range resources encompasses the Warm Springs grazing allotment. This boundary was selected because all the range resources affected by the Proposed Action fall within this boundary and because range resources are managed on an allotment basis. The area of the range resource cumulative effects study area is approximately 356,666 acres.

4.10.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

As shown in Table 4-1, ground disturbance within the range resources cumulative effects study area from past actions totals 1,636 acres; the impact from present actions totals 4,385 acres; and the impact from reasonably foreseeable future actions totals 4,923 acres. Based on these numbers of disturbed acreages, a maximum reduction of 278 animal unit months would result, based on an average stocking rate of 40 acres per animal unit month. This reduction assumes that none of the past or present disturbances have been reclaimed, but many of the past projects are in various stages of reclamation; present and reasonably foreseeable future disturbance is also likely to be reclaimed in full or in part. In addition to these actions, the study area has been affected by natural processes such as wildland fire, expansion of pinyon and juniper trees into range habitat, spread of non-native/invasive weeds, and spread of forest insects and disease. These natural processes are likely to continue into the future.

The contribution of the Proposed Action to cumulative effects on grazing would be an additional 3,920 acres of disturbance. Based on an average stocking rate of 40 acres per animal unit month, this much disturbance at one time could result in a reduction of 98 animal unit months. However, disturbed areas are proposed to be reclaimed in stages, reducing the impact on grazing. As disturbed land is reclaimed it would be re-evaluated to determine productivity, and the stocking level would be adjusted as necessary. Only the approximately 540 acres of pit expansion that would not be reclaimed would cause a permanent loss of grazing land.

4.10.3 Cumulative Impacts Conclusion

The Proposed Action combined with the other past, present, and future projects, would contribute to cumulative impacts by reducing available Animal Unit Months. However, many projects within the cumulative effects study area are temporary and would require reclamation. Past, present, and future actions would result in a temporary loss of a maximum of 278 animal unit months within the 356,666 acre cumulative effects study area. There would be some permanent loss of Animal Unit Months. Fires reduce the available Animal Unit Months most significantly compared to most project proposals, and this loss is also of a temporary nature. At the conclusion of some projects, such as mining, more Animal Unit Months will be available in sites that had restricted access, but a small permanent loss would occur with open pits that were not reclaimed. However, this could be offset by increased grazing opportunities through reclamation and a change in vegetation type from woodland to more grasses and forbs. Overall, the cumulative impact on grazing is minimal.

4.10.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

The reduction in ground disturbance under either of the two action alternatives would result in a proportional reduction in cumulative impacts to range resources. The reduction would likely be inconsequential considering the size of the cumulative effects study area. With the No Action Alternative there would be no impact on range resources other than those already authorized.

4.11 Wild Horses

4.11.1 Geographic Area for Analysis

The cumulative effects study area for wild horses consists of the Triple B Herd Management Area. The Herd Management Area boundary encompasses approximately 1,233,000 acres, including the majority of the project area.

4.11.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

As shown in Table 4-1, ground disturbance within the wild horses cumulative effects study area from past actions totals 2,566 acres; the impact from present actions totals 4,941 acres; and the impact from reasonably foreseeable future actions totals 6,037 acres. Many of the past projects are in various stages of reclamation; present and reasonable foreseeable project disturbance is also likely to be reclaimed in full or in part. Based on the amount of range available to wild horses and continued management by the BLM to control the numbers of wild horses, cumulative impacts to wild horses would be negligible. Although rare, mortalities to wild horses could also occur from collisions with vehicle.

The study area has also been affected by natural processes such as wildland fire, expansion of pinyon and juniper trees into range habitat, spread of non-native/invasive weeds, and spread of forest insects and disease. These natural processes are likely to continue into the future.

4.11.3 Cumulative Impacts Conclusion

Past, present, and reasonably foreseeable future actions would potentially affect 13,544 acres of habitat, or about 1.1 percent of the Herd Management Area. However, most of the disturbance would be reclaimed and range productivity would be restored. For the most part, the impacts would be temporary. There would be some permanent loss of forage due to open pits and permanent structures. The 3,920 acres of disturbance that would result from the Proposed Action is only 0.3 percent of the Herd Management Area. With reclamation of disturbed areas, the contribution of the Proposed Action to cumulative effects on wild horses would be negligible.

4.11.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be only minor differences in impacts to wild horses under either of the two action alternatives because of a small reduction in total disturbance. With the No Action Alternative there would be no effects on wild horses other than those already authorized.

4.12 Land Use and Access

4.12.1 Geographic Area for Analysis

The cumulative effects study area for Land Use and Access encompasses 317,038 acres of the south Ruby Mountains and portions of Huntington Valley, Newark Valley, and Long Valley (Figure 4-1). The land use and access study area boundary includes the major access routes to the project area. This boundary follows State Route 892 to the east, Long Valley Road to the west, Harrison Pass to the north, and Buck Pass to the south. These routes would most likely be used for access to the area.

4.12.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Land use in the cumulative effects study area consists mainly of ranching, mining, recreation, and wildlife habitat. The past, present, and reasonably foreseeable future actions in the cumulative effects study area (described in Table 4-1) are most likely to impact Land Use and Access by disturbing rangeland and wildlife habitat, increasing traffic on the major access routes, and restricting public access. Total estimated surface disturbance in the cumulative effects study area is approximately 10,594 acres (3.3 percent). Mining-related projects have the greatest potential impact because they restrict access for incompatible uses such as grazing and recreation. Restricted access to mining areas continues until active mining ceases and reclamation is complete. The amount of land with restricted access as a result of mining varies with each project, depending on the area currently being used for operations and the area in various stages of reclamation.

The Proposed Action would contribute to cumulative effects on land use and access by disturbing approximately 3,920 acres (1.2 percent of the study area), restricting public access to active mining areas, potentially interfering with other BLM land use authorizations, and increasing traffic on public roads. Road impacts would be partially offset by maintenance performed by Barrick during the life of the mine. It is anticipated that any conflicts with other BLM land use authorizations could be resolved by negotiation. The effects of land disturbance would be mostly temporary, lasting until reclamation is complete. Approximately 540 acres of pit expansion would not be reclaimed, resulting in permanent loss.

4.12.3 Cumulative Impacts Conclusion

The contribution of the Proposed Action to the cumulative effects of land use and access is noticeable, but temporary for the most part. Following reclamation, some features within the cumulative effects study area, such as open pits, could change land use and access long-term. For example, the open pits would be equipped with berms and warning signs to provide for public safety and limit access, while still being within an area open to grazing, wildlife use, and hunting. The type of recreational experience may change with the added attraction (for some) of viewing open pits rather than a pristine environment. Wildlife use may change favoring those that can make use of the cliffs within the pit and slightly displacing other wildlife species. With the exception of these types of changes, cumulative impacts to land use and access would be temporary and minimal in the long-term.

4.12.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be only inconsequential differences in cumulative effects to Land Use and Access under either of the two action alternatives. There would be no contribution to cumulative impacts to land use and access under the No Action Alternative other than those already authorized.

4.13 Recreation

4.13.1 Geographic Area for Analysis

The cumulative effects study area for recreation encompasses 317,038 acres of the south Ruby Mountains and portions of Huntington Valley, Newark Valley, and Long Valley (Figure 4-1) and is the same as the land use and access cumulative effects study area. The area within the cumulative effects study area is bounded by the major transportation routes that would be used to access the area surrounding the project area for recreation.

4.13.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Recreational resources in the cumulative effects study area include the Pony Express Trail and the Ruby Mountain Ranger District. Hunting, hiking, and off-road vehicle use are the dominant recreational activities in the cumulative effects study area. Off-road vehicle use in eastern Nevada has been increasing rapidly because of increasing population size and closure of other sensitive areas (BLM, 2007b). The effects of past, present, and reasonably foreseeable future actions on recreation in the cumulative effects study area (described in Table 4-1) result mainly from restricted access as a result of mining-related projects. Public access to mines must be restricted for safety reasons as long as the mines are in operation. Notices of intent and oil and gas projects could also affect recreation although they are probably less important than mining projects because of the smaller area involved. Approximately 9,594 acres of land could be removed from access for public recreational purposes as a result of present and reasonably foreseeable future actions. For the most part the impacts would be temporary for all but unreclaimed pits that would remain inaccessible for recreation. Hunting could be affected indirectly as a result of cumulative impacts to game animal habitat and movement patterns.

The Proposed Action would contribute to cumulative effects on recreation by restricting access to active mining areas. Even if the entire 3,920 acres were restricted, only 1.2 percent of the cumulative effects study area would be affected by the Proposed Action, and the effect would be temporary. Increased traffic on public roads is not anticipated to affect access to public lands for recreation. Indirect effects on game animals are unlikely to have a measurable effect on hunting.

4.13.3 Cumulative Impacts Conclusion

The cumulative effects on recreation in the study area would be minimal and temporary for most projects, except for permanent loss of pit expansion acreage that is not reclaimed. The pits may in themselves become a recreational viewing area. The principal impact on recreation would result from those projects that restrict access to recreational users of public lands. Hunting is currently among the most prevalent recreational activity within the cumulative effect study area. The impact of increased traffic and indirect effects on game animals should be minimal.

4.13.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be only negligible differences in impacts to recreation under either of the two action alternatives. Under the No Action Alternative there would be no impact on recreation other than already authorized.

4.14 Air Quality

4.14.1 Geographic Area for Analysis

The cumulative effects study area for air quality encompasses four hydrographic basins: Huntington Valley Basin (Basin Number 47); and Central Region, Newark Valley Basin (154), Long Valley Basin (175), and Ruby Valley Basin (176). These four basins cover an area of approximately 2,070,965 acres. The cumulative effects study area for air incorporates natural watershed and air quality boundaries associated with the proposed project.

4.14.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Industrial Activity within the Cumulative Effects Study Area

Historic development, as documented in Table 4-1, includes fairly extensive mining or mineral exploration activity including at least a dozen identified mining or exploration projects. Other historic projects include limited oil and gas well development, several gravel pits, the U.S. Highway 50 corridor, and the Falcon to Gonder Power Line. Those projects accounted for approximately 2,800 acres of disturbed ground. Historic vegetation management efforts included grazing and limited prescribed burning.

Currently, the only operating mine in the cumulative effects study area other than those included in the BMM Proposed Action is the Little Bald project. There is also exploration occurring around the proposed BMM and the Little Bald project. One oil and gas well field is operational, and the Silver State Fiber Optic Line is being developed through the cumulative effects study area. Disturbance within the cumulative effects study area from the present actions is approximately 5,017 acres. Of that total, 4,165 acres are associated with the BMM and Mooney Basin Operations Area activities. Most of the described activity, with the exception of the oil and gas development and the fiber optic line (85 acres of disturbance), occur in higher elevations above residential areas. Land management agencies maintain grazing programs with the goal of maintaining vegetation integrity, which can help minimize dust generation. The agencies are becoming more aggressive in using prescribed fires as a land management tool.

Foreseeable activity in the cumulative effects study area is presented in Table 4-1 and discussed in the sections that follow. Most activities, with the exception of gravel pits and potential oil and gas development, are or would be at elevations well above the valleys where sensitive receptors (human residences) are located. Disturbance within the cumulative effects study area associated with other mines and potential wind energy projects, in combination with potential ground disturbance from the Proposed Action for the reasonably foreseeable future, would be approximately 6,005 acres. Disturbed ground would allow the wind to lift and transport fugitive dust. The mining activities would also generate fugitive dust from material transport and storage efforts during their operational life spans. Reclamation to minimize wind erosion and disturbed ground would be expected after the operational life span of each project. Because these activities would generally occur at higher elevations than sensitive receptors and dust generation volumes would be small compared with the distance to sensitive receptors, the cumulative impact of the high elevation operations, including the proposed project, would be expected to be mostly minor in areas of public activity or exposure. Ground disturbance in the lower elevations associated with utility corridors and other listed ground disturbances increase soil wind erosion and would continue to do so in the future until reclamation is successful. The impacts are typically localized and minor for all but the largest areas of disturbance, which tend to be away from areas of regular human activity. Past, present, and reasonably foreseeable gravel production generates dust that could lead to moderate impacts in the immediate vicinity. Those activities are generally at lower elevations, preferably sited away from sensitive receptors including residences and areas of regular human activity.

Air quality modeling was performed to estimate mercury deposition in the cumulative effects study area and beyond by Air Sciences (2008) using the Environmental Protection Agency Regional Modeling System for Aerosols and Deposition and regional and national mercury emissions and monitoring data. The AggreGATOR program was used as a tool to interpret the Regional Modeling System for Aerosols and Deposition modeling results. The model results indicated that cumulative impact from all industrial activity in the western United States was generally less than one tenth of global background mercury levels. BMM mercury emissions represented over 1 percent of all mercury depositions in only the hydrologic basins immediately northwest and northeast of the facility, with a maximum impact of 4.4 percent of cumulative mercury deposition. The cumulative impact of all gold mines reached 10 percent of all mercury deposition in only three hydrologic basins 50 to 150 miles northwest of the BMM. Cumulative impacts of all gold mines in the cumulative effects study area remain under 10 percent of all mercury deposition in all hydrologic basins.

Figure 4-3 provides the mercury deposition contributions from BMM's mercury emissions as a percentage of the total deposition (including global background) to each watershed in Nevada. Figure 4-4 provides the mercury deposition contributions from the mercury emissions from all Nevada gold mines to each watershed in Nevada. As shown by Figures 4-3 and 4-4, the deposition contribution from the gold mines is localized. For example, the mercury deposition from BMM drops off to less than one percent at two watersheds distance from the mine (Air Sciences, 2008).

Figure 4-5 provides the mercury deposition contributions from the global background to each watershed in Nevada. The global background accounts for 66 percent to 97 percent of the total deposition in each watershed (Air Sciences, 2008).

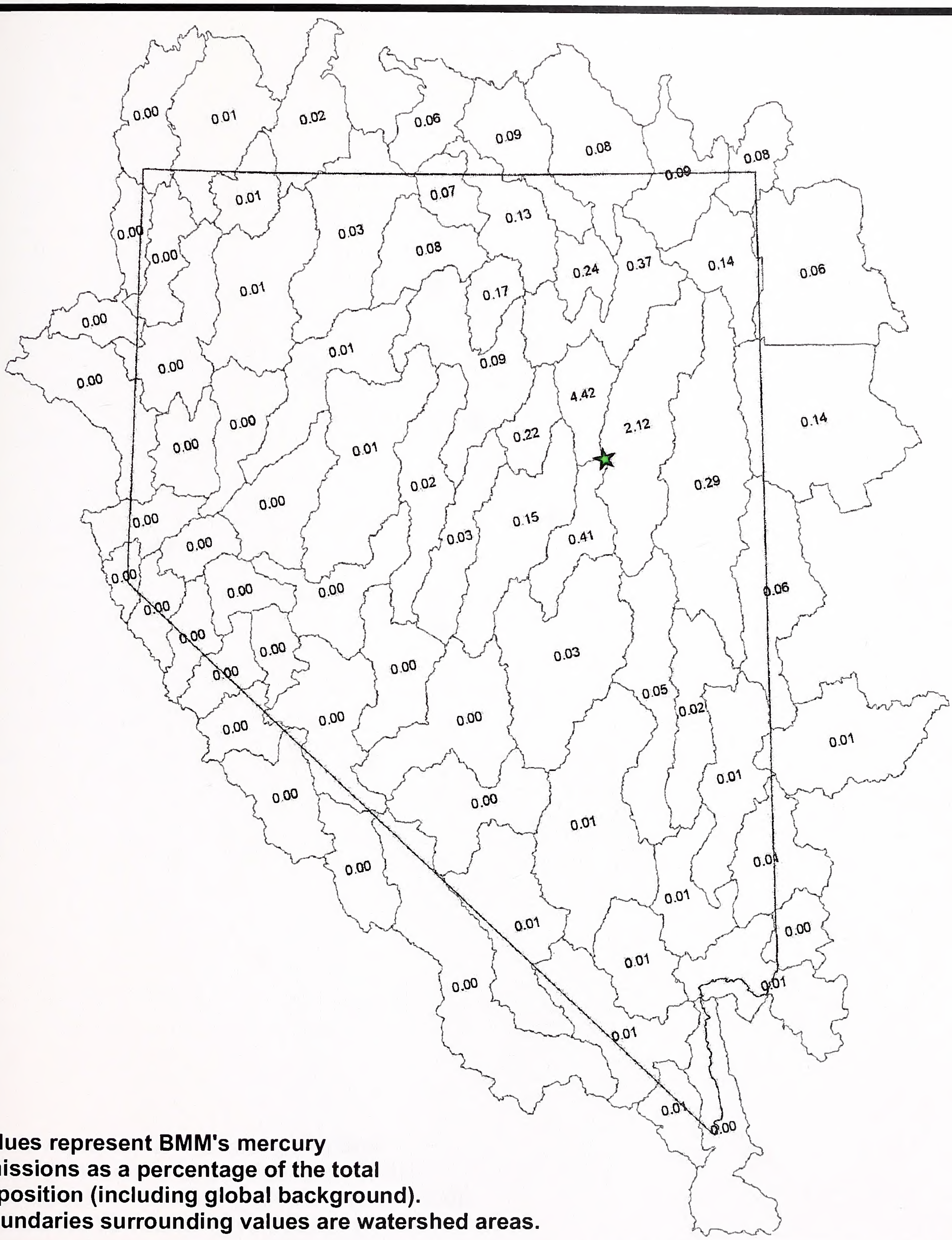
The one potential industrial activity in the cumulative effects study area that has the potential to have moderate impacts on sensitive human receptors is the addition of five oil and gas exploration wells and possible subsequent development or expansion of two existing wells. The BLM has issued a number of leases within the valley floor locations in the cumulative effects study area. Current drilling activity is minimal, with only 15 acres of ground disturbed in the cumulative effects study area. Drilling activities typically include a few weeks to one month construction phase during which ground disturbances and construction activity could have a moderate impact on air quality approximately one mile downwind from the well site and within approximately 100 yards of primary access routes. During operational exploratory drilling, large diesel engines typically power the drilling rig, and any gas discovered is either vented into the air or is flared off until processing equipment can be put in place. Exploratory drilling typically occurs over a three-month period. During that period, moderate air quality impacts are possible within a couple of miles of the well site as well as within 100 yards of the primary access routes. Flaring or gas venting at sites that show development potential could result in moderate air quality impacts one half mile from the well. Production of oil and/or gas reserves would take some time to get started but would represent an ongoing activity for the life of the well. The extent of moderate impacts from a production well site depends on the volume of oil or gas found, how it is stored or processed on-site, how it is transported off-site, and whether there are existing power lines or new power lines or all equipment must be run on diesel or gas. Production wells beyond moderate size are not expected in or near the cumulative effects study area. The area of moderate impact for potential oil and gas field development would therefore be expected to be limited to within a two-mile radius around developed well sites and within 100 yards of primary access routes.

The traffic increase generated by increases in industrial activity in the cumulative effects study area has the potential for moderate air quality impacts within approximately 150 yards of dirt or gravel roads.

Cumulatively, current projects inside and outside the cumulative effects study area are understood to have an overall minor impact on air quality, though impacts can be moderate in the near vicinity of individual projects. Foreseeable projects could extend the extent of moderate impacts to cover the areas around a larger number of project sites, or potentially over larger areas, if or when project sizes or areas of activity expand.

Industrial Activity outside the Cumulative Effects Study Area

Coal-fired power plants currently exist north and northwest of the project cumulative effects study area. New coal-fired power plants have been proposed in Steptoe Valley, a few valleys to the east of the cumulative effects study area, and in other locations regionally. Numerous other mining operations are currently active in the areas surrounding the cumulative effects study area or could potentially be active in surrounding hydrographic basins, most at higher elevation locations. Nevada Division of Environmental Protection review of air quality permits indicate that those projects individually do not have significant impacts in this project's cumulative impact area and that their cumulative impacts do not exceed incremental thresholds established by the federal Prevention of Significant Deterioration program. Cumulatively, current projects inside and outside the cumulative effects study area are understood to have a minor impact on air quality. Foreseeable projects could bring cumulative impacts from regional sources intermittently to moderate levels.



Values represent BMM's mercury emissions as a percentage of the total deposition (including global background). Boundaries surrounding values are watershed areas.

Legend

★ Bald Mountain Mine

SOURCE: AIR SCIENCES, 2008

N

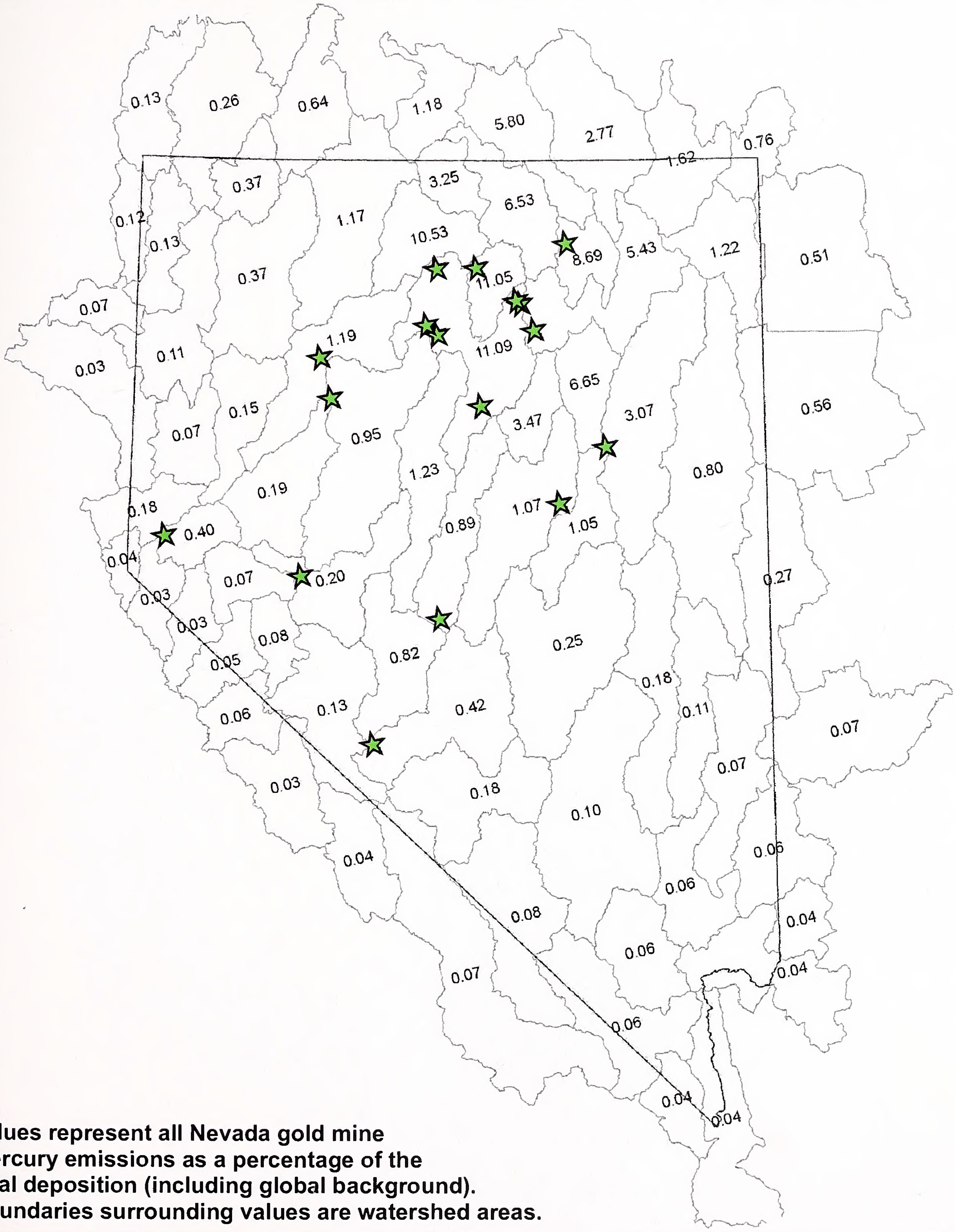
0 200,000 400,000
Feet

1:4,800,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 4-3

Bald Mountain Mercury Deposition Contributions to Watershed (Percent of Total)



Values represent all Nevada gold mine mercury emissions as a percentage of the total deposition (including global background). Boundaries surrounding values are watershed areas.

Legend

★ ALL GOLD MINES

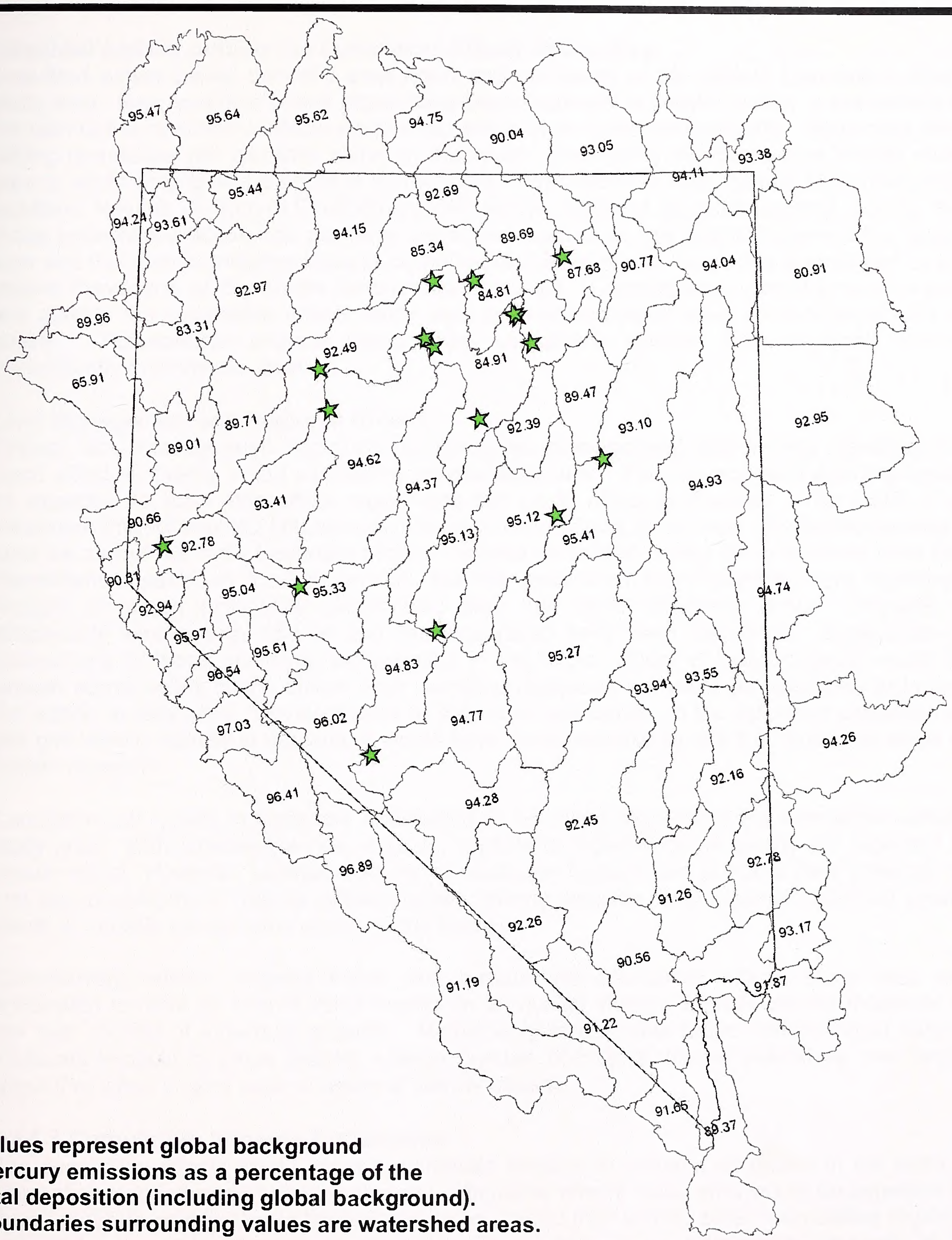
SOURCE: AIR SCIENCES, 2008

N

0 200,000 400,000
Feet
1:4,800,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 4-4
Mercury Deposition Contributions to Watershed from All Nevada Gold Mines (Percent of Total)



Values represent global background mercury emissions as a percentage of the total deposition (including global background). Boundaries surrounding values are watershed areas.

Legend

★ GLOBAL BACKGROUND

SOURCE: AIR SCIENCES, 2008

N

0 200,000 400,000
Feet
1:4,800,000

BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

FIGURE 4-5
Mercury Deposition Contributions to Watershed from Global Background (Percent of Total)

Industrial Activity outside the Cumulative Effects Study Area

Coal-fired power plants currently exist north and northwest of the project cumulative effects study area. New coal-fired power plants have been proposed in Steptoe Valley, a few valleys to the east of the cumulative effects study area, and in other locations regionally. Numerous other mining operations are currently active in the areas surrounding the cumulative effects study area or could potentially be active in surrounding hydrographic basins, most at higher elevation locations. Nevada Division of Environmental Protection review of air quality permits indicate that those projects individually do not have significant impacts in this project's cumulative impact area and that their cumulative impacts do not exceed incremental thresholds established by the federal Prevention of Significant Deterioration program. Cumulatively, current projects inside and outside the cumulative effects study area are understood to have a minor impact on air quality. Foreseeable projects could bring cumulative impacts from regional sources intermittently to moderate levels.

Land Management and Regional Growth

Federal land management decisions, including fire management and energy development, could affect air quality in the cumulative effects study area. Fire management activities would be expected to have little effect region-wide but could affect local areas. The USFS Fuel Treatment Project affected 500 acres in the cumulative effects study area. Controlled burning is used as part of the fuels treatment project. Smoke generated during the prescribed burn had intermittent impacts on local air quality, but the prescribed burns prevent more significant impacts of larger, potentially catastrophic fires that could otherwise occur. Impacts of foreseeable wind energy and oil and gas exploration have been discussed. Expansions or contractions of those programs are possible in the future. Most of those projects would be located above valley floors, distant from sensitive receptors, so would be less likely to impact the human activity area. Developments by individual landowners in the valleys or expanded oil and gas leasing activity in the valleys would have more potential to affect air quality in areas of human exposure.

Cumulative air quality impacts are anticipated to be minor throughout the cumulative effects study area. With foreseeable new projects, impacts to region-wide air quality are expected to remain minor. However, isolated pockets of moderate impacts are possible near potential oil and gas development, vehicle access routes, mining projects, and regional coal-fired power plants (if multiple plants come on line in the future).

Cumulatively, current projects inside and outside the cumulative effects study area are anticipated to have an overall minor impact on air quality, though impacts can be moderate in the near vicinity of individual projects. Reasonably foreseeable future actions could extend moderate impacts to areas around a larger number of project sites or potentially over larger areas if or when project sizes or areas of activity expand.

4.14.3 Cumulative Impacts Conclusion

The cumulative effects would result in moderate impacts to ambient air quality in the vicinity. The anticipated industrial activity within the cumulative effects study area would be expected to have moderate contribution to the isolated areas around their activity area. Cumulative regional industrial source impacts in the cumulative effects study area, including the impacts of all current mines and power plants, represent well under 10 percent of total mercury deposition. Global background airborne mercury supplies more than 90 percent of mercury deposition (Air Sciences, 2008). Land management activities and regional growth would likely result in minor impacts to ambient air quality across the rest of the cumulative effects study area over the long term, though intermittent actions such as prescribed fire could be expected to briefly result in moderate or possibly major impacts locally. The results of ambient air quality modeling showed compliance with those applicable impacts at all locations (Appendix H).

4.14.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be no meaningful change in cumulative impacts to air quality under the two action alternatives. Under the No Action Alternative there would be no impact on air quality other than that already authorized.

4.15 Visual Resources

4.15.1 Geographic Area for Analysis

The cumulative effects study area for Visual Resources encompasses 317,038 acres of the south Ruby Mountains and portions of Huntington Valley, Newark Valley, and Long Valley (Figure 4-1). It encompasses the area that could be visually impacted by the Proposed Action and includes the majority of viewpoints from which disturbance would be seen.

4.15.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

The portion of the cumulative effects study area north of the Elko-White Pine county line is in the BLM Elko District. Recreational users of the Ruby Mountains and Ruby Lake National Wildlife Refuge (public land administered by the USFS and U.S. Fish and Wildlife Service, respectively) could be more sensitive to visual impacts to the natural landscape because of the scenic views. The portion of the cumulative effects study area south of the Elko-White Pine county line is within the boundaries of the Egan Field Office of the BLM's Ely District. Most of the BLM Ely District land in the cumulative effects study area is within Visual Resource Management Class III or IV. However, the land within one mile of the Pony Express Trail in the central portion of the cumulative effects study area is designated Visual Resource Management Class II (BLM, 2008d). The Pony Express Trail could attract viewers that are sensitive to visual impacts that would alter the historic setting of the trail.

Past and present mining projects and other land-disturbing activities (e.g., fires, grazing, farming, roads) in the cumulative effects study area have resulted in visual impacts that can be seen by viewers in the cumulative effects study area, including portions of the Pony Express Trail. The USFS Fuel Treatment Project disturbed approximately 500 acres of pinyon-juniper woodland, creating a visual contrast that would last until new vegetation has established. The Proposed Action would add to these impacts, as described in Chapter 3. These visual impacts would last until the disturbed land was successfully reclaimed.

If implemented, the reasonably foreseeable future mining projects and other activities presented in Table 4-1 could affect visual resources by removal of vegetation or changing vegetation communities. The Alligator Ridge Mine and Yankee Mine are too far south of the Pony Express Trail to be visible from this sensitive viewing area. However, other mining projects would likely be visible, at least in part. The effects of mining projects would last until active mining is completed and the disturbance was successfully reclaimed, although color and texture changes resulting from the change in vegetation communities would last much longer. The oil and gas wells described in Table 4-1 would likely be seen from only a small area and would have a much smaller effect on visual resources.

4.15.3 Cumulative Impacts Conclusion

Visual resources in the cumulative effects study area have been affected by past, present, and reasonably foreseeable future actions. Projects that could have impacts visible from the Pony

Express Trail are the most problematic since this is the most visually sensitive area within the cumulative effects study area. The Proposed Action would add cumulatively to the disturbances seen within the long range viewshed of this trail, but would not impact the one mile buffer of the Class II management area around the trail. The great majority of cumulative impacts would last until natural vegetation has become established in disturbed areas, which could take many years. Until then, form and color change would be apparent with altered vegetation communities. Open pits and structures associated with some proposed actions would be permanent. Most of the disturbances in the study area, including the Proposed Action, are within Class III and IV visual resource management areas. Class IV allows for strong contrast, while Class III allows for moderate contrast. Most of the Class III designations are along travel routes most visible to the public. These areas are also subject to periodic developments where the final design and/or reclamation should be such that only moderate visual contrast would occur, thus preserving the overall aesthetic appeal of the region. The Proposed Action would add cumulatively to these disturbances.

4.15.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be only inconsequential differences in impacts to Visual Resources under either of the two action alternatives. Under the No Action Alternative there would be no impact on visual resources other than that already authorized.

4.16 Noise and Vibration

4.16.1 Geographic Area for Analysis

The cumulative effects study area for Noise and Vibration is the same as the geology and minerals cumulative effects study area because the primary additional noise sources within the area would most likely be from additional mining activity that would take place within the geology and minerals boundary. It encompasses approximately 199,258 acres.

4.16.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

There has been historic mining activity in the southern Ruby Mountains, including Bald Mountain. Historic projects besides BMM include the Casino/Winrock Mine, Little Bald Mountain, Alligator Ridge and Yankee mines, and White Pine Mine. All of these except BMM are inactive mines. Exploration that could lead to future mining activity is being undertaken throughout the cumulative effects study area. BMM proposes up to 400 acres of exploration. A resumption of mining is reasonable foreseeable at the Alligator Ridge Mine, and a 143-hole exploration program is being proposed for the Yankee Mine. Extensive exploration within the Barrick claim block is likely in the future. Mining activities would generally occur at elevations well above public activity or exposure, far from sensitive receptors in valley locations. Because of their dispersed locations, exploration activities are not expected to add much more direct noise impact to populated areas with sensitive receptors, except for intermittent blasting or air travel sounds. Those projects could increase traffic levels in the valleys and supporting communities to yield noise impacts at or within 100 yards of access or supply roadways. Numerous simultaneous mining operations in close proximity could have moderate impacts on nearby ranches and moderate to occasionally significant impacts along access roads.

One exploration oil well exists within the cumulative effects study area. Numerous others exist in close proximity to the cumulative effects study area. BLM has issued leases for oil and gas exploration in the valleys of the cumulative effects study area. Development associated with those leases has been limited to date, but lease holders have the right to drill exploratory wells and would be expected to bring those wells into production if exploration indicated a sufficient resource. Those leases include valley floor locations that have a chance of being close to human activity areas and sensitive receptors in valley locations. Locations within one mile of an exploratory well or along primary access roads can experience moderate noise impacts during the construction and exploration stage, which typically lasts three to four months at a specific site. If exploration confirmed a find, production of oil and gas could cover a larger area and extend moderate noise impacts a couple of miles beyond the perimeter of the well field and at least 100 yards from primary access routes.

There have been a few gravel pits historically in the cumulative effects study area and more in the broader area around the BMM. Those pits are generally located along highways or main roads in easily accessible areas. Operation of existing and new gravel pits in the cumulative effects study area is anticipated in the future. Those gravel operations can have moderate noise impacts for between one quarter to one half mile, possibly longer in valleys where air and noise movement are channeled. Noise impacts should be considered in siting a gravel pit, which should reduce the number of such activities close enough to areas of regular human activity to minimize the noise impacts.

4.16.3 Cumulative Impacts Conclusion

Cumulative impacts would generally lead to minor noise increase across the cumulative effects study area. However, due to the isolated nature of the projects, no significant impacts to noise levels at sensitive receptors are anticipated. In most locations, noise impacts associated with projects throughout the cumulative effects study area would be small in comparison with natural background noise levels.

4.16.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

The variation in noise effects among the action alternatives is inconsequential. Under the No Action Alternative there would be no impact on noise levels other than those already authorized.

4.17 Socioeconomics

4.17.1 Geographic Area for Analysis

The cumulative effects study area for socioeconomics encompasses White Pine, Eureka, and Elko counties (Figure 4-2). The cumulative effects study area for socioeconomics was selected because all of the BMM employees would reside in one of these three counties.

4.17.2 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

The economies of the three counties are dependent to a large degree on mining activity, which is determined to a large extent by the market price for gold, silver, and other extracted minerals. Consequently, economic activity tends to cycle between boom and bust. When mineral prices are high, employment and wages rise and a shortage of skilled workers develops. Home prices tend to rise as new employees move into the area and local businesses profit from increased spending. A drop in mineral prices or other limitations on mine development result in a reversal of this process; employment and spending fall and local businesses falter. This cyclical pattern is detrimental to the counties' financial stability and their ability to plan for the future and provide reliable services to the community.

Mining is likely to be the dominant industry in northeastern Nevada for the foreseeable future, and the counties can suppress the boom and bust cycle only by increasing economic diversity. Elko County is the most diversified of the three. Tourism spending in White Pine County has been increasing, and additional spending, independent of mining, comes from the State Prison and federal, state, and local government offices. The economy of Eureka County is dominated by mining and will probably remain so for the foreseeable future.

The economy of Elko County is much larger than the economies of Eureka and White Pine counties. Existing mines in the county include Capstone Mine (produces gold and silver, operated by Newmont), Jerritt Canyon Mine (produces gold and silver, operated by Queenstake Resources), Meikle Mine (produces gold and silver, operated by Barrick), Midas Mine (produces gold and silver, operated by Newmont), Pilot Peak Lime Plant (produces limestone and lime, operated by Graymont Western), Tonkin Spring Mine (produced gold, currently closed with exploration by U.S. Gold) Rain Mine (produces gold, operated by Newmont), and Rossi Mine-Dunphy Mill (produces barite, operated by Halliburton Energy Services/Baroid). Newmont just finished constructing a 200-megawatt coal-fired power plant in the Carlin Trend area; excess capacity would be sold to a local utility. Even though most of the new employees of the Proposed Action are expected to reside in Elko County, the number of employees is small enough that the contribution to cumulative effects on socioeconomic conditions in the county would be minor.

The most significant recent effect on the White Pine County economy has come from renewed activity in the Robinson Mining District, a project that has largely restored the soundness of the county's finances. Several other reasonably foreseeable major projects have been proposed for White Pine County. These include the White Pine County Airport expansion, the Egan Range Wind Generating Project, the Clark, Lincoln and White Pine counties groundwater development project proposed by the Southern Nevada Water Authority, the Ely Energy Center proposed by Nevada Power and Sierra Pacific Power Company, and the White Pine Energy Station proposed by LS Power. These major projects have the potential to transform White Pine County's finances and reduce the effect of mining-related economic cycles. The projects could have major impacts on population size, housing, schools, and demand for utilities and county services such as road maintenance, law enforcement, and fire protection. A shortage of skilled workers could also develop (Rajala, 2007). When viewed in this context, the contribution of the Proposed Action to cumulative effects on the economy of White Pine County would be relatively minor.

In Eureka County the Betze-Post and Ruby Hill mines are operated by Barrick and the Eastern Nevada Operations mine is operated by Newmont. The proposed Mount Hope molybdenum mine, which is located about 23 miles northwest of Eureka, is projected to begin operation in 2010. The Mount Hope Mine would be the largest and one of the highest grade molybdenum projects in the world. The mine has 1.3 billion pounds of proven and probable reserves and a projected life of 53 years. The Mount Hope Mine could account for nearly eight percent of the annual global molybdenum supply. The Mount Hope Mine would have a significant impact on the socioeconomic resources of Eureka County. An estimated 800 people are anticipated to be employed during the construction of the mine and associated facilities, and 400 people during operation. This project would have a significant positive impact on Eureka County but could present problems such as inadequate housing and increased demand for sewage treatment, water, and other County services. The addition of the Proposed Action would have a much smaller impact to County services but would add to the overall cumulative impact to Eureka County. The contribution of the Proposed Action to cumulative effects on socioeconomics in Eureka County would be minimal compared with the existing and proposed mining projects.

4.17.3 Cumulative Impacts Conclusion

The Proposed Action would contribute to cumulative effects on socioeconomics by increasing employment, income, and the demand for housing, schools, law enforcement, fire protection, and other services and infrastructure. When viewed in the context of much larger existing and reasonably foreseeable future actions in the cumulative effects study area, the contribution of the Proposed Action to cumulative impacts would be relatively minor.

4.17.4 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

There would be no measurable differences in impacts to socioeconomic conditions under either of the two action alternatives. Under the No Action Alternative there would be no contribution to cumulative impacts on socioeconomic conditions other than those already authorized.

4.18 Cultural Resources

4.18.1 Assumptions for Analysis

Assumptions for analysis for the cumulative effects to prehistoric resources include:

- The density of prehistoric and historic sites within areas that have not yet experienced archaeological survey are based solely upon the density of sites elsewhere within the Bald Mountain Mining District with similar landforms, soils, and floristic relationships (Kautz and Simons, 2005).

4.18.2 Geographic Area for Analysis

The cumulative effects study area for cultural resources has been created from maps that describe the overall territories occupied by both prehistoric and historic mining populations. This area is approximately 1,211 square miles and encompasses 775,144 acres. Prehistorically, this area has been based on the Middle Archaic to Late Prehistoric migration pattern within the region as suggested by Steward (1938) and actually tested archaeologically by Thomas (1971).

4.18.3 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

The existing Programmatic Agreement between the BLM and the Nevada State Historic Preservation Office has added to the archaeological study and knowledge of the region, while allowing most significant cultural resources to be avoided or mitigated (BLM, 1995b).

Four National Register of Historic Places-eligible prehistoric archaeological sites are located within the BMM Proposed Action area. Additionally, 16 unevaluated sites (15 prehistoric, 1 historic) are present in the Proposed Action area. These 16 unevaluated sites will have to be revisited and evaluated for their National Register status. As projected mining activities would result in an impact to archaeological sites prior to any ground-disturbing activities at or near an eligible site, they would be mitigated as specified in the Programmatic Agreement. Also, any exploration or development activity within 150 meters of any National Register of Historic Places-eligible or unevaluated archaeological site would be monitored by a federally permitted archaeologist to protect the site's integrity.

Past, present, and reasonably foreseeable future surface disturbance for the cultural resources cumulative effects area include past mining and proposed gold mining within approved areas as well as past and future oil and gas wells, Casino Winrock and Little Bald Mountain gold mining projects, and wind energy projects (Table 4-1). These latter non-mining projects account for fewer than 10 percent of the acres reserved for mining. As with all federal undertakings, these development activities will be guided by cultural resource laws designed to mitigate the effects of projects on archaeological and architectural resources.

4.18.4 Cumulative Impacts Conclusion

With reference to Table 4-1, the total acreage projected to experience surface disturbance within the cumulative effects study area for cultural resources within the foreseeable future is 14,373 acres, or approximately 1.9 percent of the cumulative effects study area. Cumulative impacts to the archaeological site resource can be estimated by calculating the number of archaeological sites that would be impacted by these estimated disturbances as the outcome of dividing total acreage by the average number of surveyed acres per site (14,851/38). The resulting number is an estimate predicting that approximately 390 archaeological sites may be cumulatively affected by past, present, and future actions.

4.18.5 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

Cumulative impacts to prehistoric and historic resources, as estimated using the assumed density of sites discussed above, would be little different under any of the action alternatives. In contrast, selection of the No Action Alternative would result in no additional impacts to prehistoric and historic resources other than those already authorized.

4.19 Hazardous and Solid Waste/Hazardous Materials

4.19.1 Assumptions for Analysis

The following assumption was made for analysis of the cumulative effects to hazardous and solid waste/hazardous materials:

- The risk of a reportable spill amount or fuel released to the environment is more likely during transportation than during storage or use.

4.19.2 Geographic Area for Analysis

The hazardous and solid waste/hazardous materials cumulative effects study area consists of the project area, which includes storage and on-site disposal areas, and the transportation routes analyzed in this document and shown on Figure 4-1.

4.19.3 Impacts of the Past, Present, and Reasonably Foreseeable Future Actions

Past projects that received chemical shipments on the routes analyzed in this DEIS include the Yankee Mine, the White Pine Mine, and the Casino/Winrock Mine. These properties were responsible for operating in accordance with applicable regulations, and there are no known current environmental impacts from the delivery of chemicals along the analyzed transportation routes from these operations.

The BMM and Mooney Basin Operations Area currently receive chemical shipments and store hazardous materials and waste on the property in accordance with applicable local, state, and federal requirements as described in this document. Other present actions which may involve the analyzed transportation routes include mineral exploration activities, oil and gas wells, and maintenance activities on the Silver State Fiber Optic Line. These activities bring increased vehicle traffic and may involve the transport of small amounts of chemicals to the sites for use in mining exploration, oil and gas production, and fiber optic maintenance activities. Increased traffic on the access roads also increases the potential for vehicle collision with a supply vehicle.

The reasonably foreseeable future actions shown in Table 4-1 could cause an increase in vehicular traffic on the analyzed transportation routes. New mining projects would require chemical deliveries to support construction, mining, and processing activities. Wind energy projects would require the mobilization of construction equipment, fuel, and possibly other chemicals needed for construction equipment. The construction of production oil and gas wells would require material storage and transportation for the life of the projects.

4.19.4 Cumulative Impacts Conclusion

The cumulative impacts on hazardous waste are mainly due to industrial projects and especially mining. Therefore, the Proposed Action is one of the larger potential contributors within the cumulative effects study area. The increase in some hazardous waste shipment quantities and the extension of the delivery time period (10-year life-of-mine) would slightly increase and extend the risk period for the release of a hazardous substance as previously described in Chapter 3. The transport of hazardous materials for the Proposed Action represents a continuation (with some quantity increase) of shipments for the BMM and Mooney Basin Operations Area. The Casino/Winrock, Yankee, and White Pine mining projects, which previously received chemical shipments on routes analyzed in this document, are no longer active operations. An increase in traffic associated with the Proposed Action and other reasonably foreseeable future actions would increase the likelihood of vehicle collisions on the access roads, thus possibly increasing the probability of accidents resulting in a release of a hazardous material.

With the continued, proper implementation of the Emergency Response Plan for on- and off-site incidents and Design Features as described in Table 2-13, cumulative impacts associated with storage, use, and transportation of hazardous materials are not anticipated.

4.19.5 Variation in Cumulative Impacts between the Proposed Action and Other Alternatives

Cumulative impacts for the action alternatives would be the same as those analyzed for the Proposed Action. The No Action Alternative would result in no impacts other than those already authorized.

Chapter 5
Consultation and Coordination

5.1 Public Participation Summary

Public involvement is an important part of the environmental analysis under the NEPA process. Federal agencies are required to make "diligent efforts" to involve the public early and often in preparing and implementing their NEPA procedures, to inform the public by providing public notice of NEPA-related hearings, public meetings, and availability of documents, and to solicit appropriate information from the public (40 Code of Federal Regulation 1506.6).

The goal of the public involvement process is to foster public understanding of the Proposed Action and allow participation in the analysis and decision-making process regarding the proposed BMM North Operations Area Project DEIS. The BLM prepared this EIS to analyze environmental effects of the Proposed Action and a reasonable range of alternatives. The public is being afforded the opportunity to review and comment on the DEIS. "Public" refers to interested citizens, organizations, Native American tribes, and other governmental agencies.

There are a number of opportunities for the public to provide input in the EIS process including the following:

- Project Proposal: A revised Plan of Operations was submitted in February 2009.
- Project Scoping/Issues Identification: A Notice of Intent to prepare an EIS for the BMM North Operations Area Project was published in the Federal Register on March 30, 2007. The Notice of Intent announced scoping meetings to be held in the neighboring communities of Ely, Elko, and Eureka, Nevada, and invited scoping comments to be submitted to the BLM. Scoping meetings were held in Elko, Ely, and Eureka, Nevada, on May 7, 8, and 9, 2007, respectively. The closing date for acceptance of public comments was May 25, 2007, with the entire public scoping period being open for 56 days. Public notices were published in the Elko Daily Free Press and Ely Daily Times and were also posted in multiple locations in Ely, Elko, and Eureka.
- Data Collection: All resources and analytical data used in the analysis have been made available to the public so they have had the opportunity to review and analyze the same body of data as the EIS Team (excluding confidential materials under the Freedom of Information Act).
- Development of Alternatives: The BLM has considered public input in development of project alternatives. Based on public input and discussion with the EIS Team, a reasonable range of alternatives has been analyzed that appropriately responds to issues identified during the scoping process. The EIS team consisted of the BLM, Barrick, NDOW, and JBR Environmental Consultants, Inc.
- DEIS: The DEIS described the affected environment, potential environmental impacts, and reasonable mitigation measures in plain language and graphics so decision makers and the public could readily understand this information. The BLM invited the public to comment on the DEIS.

- FEIS: Following review of the DEIS, the EIS Team analyzed and responded in writing to public comments on the DEIS in the FEIS. The BLM made appropriate additions and/or corrections necessary to respond to public input on the DEIS. Copies of the FEIS were be provided to the same breadth of public that received the DEIS.

- Record of Decision: The Record of Decision states how the selected alternative addresses public issues as well as other factors. Copies of the Record of Decision will be provided to the same breadth of public that received the FEIS. As part of the FEIS, the public has been provided instructions on how a member of the public who is adversely affected by the decision may appeal the decision to the Interior Board of Land Appeals.

5.1.1 DEIS Scoping

Public participation in the development of the BMM North Operations Area Project DEIS focused on identification of issues and concerns with features of the project and development of alternatives. Key elements to date in obtaining the public input with the process include the following:

- Mailing List: A mailing list was developed to include members of the public, agencies, and organizations with interest in the project. The original project mailing list developed in March 2007 is provided in Appendix B. The project scoping statement, Notice of Availability of the DEIS and FEIS, and any other project updates or information will be sent to those on the mailing list. This list will be updated over time and includes the interested public, as well as others that respond to public notices of the project analysis.

- Scoping Statement: In March 2007, a scoping statement (letter) was prepared and sent to all parties on the mailing list. This statement provided an overview of the BMM North Operations Area Project Plan of Operations, identification of preliminary issues, the times, dates, and locations of three separate scoping meetings, a request for written comments, directions on how to submit scoping comments, and identification of BLM contacts. A copy of the scoping letter (March 2007) is included in Appendix B of this document.

- Notice of Intent: A Notice of Intent to prepare an EIS was developed by the BLM Egan Field Office, reviewed by the BLM Nevada State Office, BLM Washington Office, and Department of Interior, and published on March 30, 2007, in the Federal Register. The publication of the Notice of Intent initiated the formal 30-day scoping period. A copy of the Notice of Intent is included in Appendix B of this document.

- Legal Notice/News Release: A legal notice of the BMM North Operations Area Project Plan of Operations was prepared by the BLM, published in the Elko Daily Free Press and Ely Daily Times, and distributed to locations in Ely, Elko, and Eureka. A news release was also distributed to the appropriate publications. Copies of the legal notice and news release are included in Appendix B of this document.

- Scoping Meetings: Scoping meetings were held in Elko, Ely, and Eureka, Nevada. These were informal open houses where information on the NEPA process and project specifics were displayed with posters, handouts, and presentations. Representatives of BLM, NDOW, and Barrick attended the meetings. Public attendees at the meetings were asked to sign a register and invited to provide scoping comments. A list of the public attendees is provided in Table 5-1. No additional meetings were scheduled or requested during the scoping process. Other future meetings may be held, as necessary during the development of the EIS, between the BLM and interested individuals, agencies, and organizations to obtain additional input.

TABLE 5-1 INDIVIDUALS PRESENT AT THE PUBLIC SCOPING MEETINGS

Name	Organization
Herb Ley	BMM
Richard Curnow	BMM
Marti Collins	USFWS – Ruby Lake National Wildlife Refuge
Rich Weber	JBR Environmental Consultants, Inc.
Dave McClure	BMM
George Fennemore	Barrick Gold Corporation – Cortez Gold Mines
Steve Schoen	Barrick North America
Pete Kowalewski	Tetra Tech
Diane Rice	Wells Fargo
Tom Rice	BMM
Lou Schack	Barrick North America
Dan Callaghan	BMM
Scott Holmes	Barrick
Jeffrey Merchant	Parsons Behle & Latimer
Tina Reynolds	BMM
Scott Wilson	Scott E. Wilson Consulting
Nick Atiemo	BMM
Val Sawyer	SRK Consulting
Rory Lamp	Nevada Department of Wildlife
Dave McClure	BMM
Judy Overton	Eureka County, Department of Natural Resources
Jon Overton	Nevada Resource Advisory Council
Jim Ithurralde	Eureka County Commissioner
Don Harris	Midway Gold Corp.
John Pekrul	Barrick North America
Rob Geskey	Elevation Technical Services
Dave McClure	BMM
Tom Bath	Bath Lumber

5.1.2 Public Comment on DEIS

The Notice of Availability was published in the Federal Register on December 19, 2008 (Volume 73 Number 245) for the BMM North Operations Area Project DEIS starting the public comment period. The public comment period lasted 45 days from December 19, 2009 until February 2, 2009.

- Legal Notice/News Release: A news release was prepared by the BLM Ely District office announcing the start of the 45-day public comment period, identifying the time and locations of public comment meetings, and inviting public comment on the North Operations Area DEIS. This news release was posted on the BLM Ely District web page on December 19, 2008 and published in The Ely Times on December 13, 2008. An announcement with this information was published in the Elko Daily Free Press on January 2, 3, and 5, 2009.

- Public Meetings: Three public comment meetings were held during the public comment period. These meeting were held in Ely, Nevada on January 6, 2009; Elko, Nevada on January 7, 2009; and in Eureka, Nevada on January 8, 2009. Project information was presented in an open house format at these meetings with BLM and Barrick representatives present to discuss concerns and answer questions. Table 5-2 lists individuals present at these meetings.

- Public Comments: Individuals, public agencies, and non-profit organizations submitted 17 letters containing comments on the DEIS. The comments received and responses to these comments are contained in Appendix C.

TABLE 5-2 INDIVIDUALS PRESENT AT THE PUBLIC COMMENT MEETINGS

Ely, Nevada Meeting, January 6, 2009	
Curt Lee	Bill Wilson
Dave McClure	Matt Zietlow
Steve Shoen	Sheri Wysong
Elko, Nevada Meeting January 7, 2009	
David Peirce	Joe Giraudo
Teresa Conner	Stephanie Stoeberl
Nick Atiemo	Val Sawyer
Chet Littledyke	Larson R. Bill
Andy Cole	Jason Bill
Amanda Steensen	Cheryl Mose-Temoke
Caleb McAdoo	Julie Bill
Dave McClure	Ken Mow
Lou Schack	Pat Rogers
Eureka, Nevada January 8, 2009	
Jake Tibbitts	Cliff Krall
Zach Spencer	Jim Brady
Wade Bohrn	Dave McClure
Bob Stephenson	Gina Solari
Jim Ithurralde	Randy Buffington
Tyler Hilkwich	Evan Verkade
Jon Kamensky	Paul Clark
Chris Kamensky	Debbie Clark

5.2 Criteria and Methods by Which Public Input Is Evaluated

All comments received during initial scoping were recorded and summarized in a Summary of Public Input (Table 1-3). The written comments are part of the Project Administrative Record.

The DEIS with a cover letter was mailed to those who commented during initial scoping and those on the mailing list who have indicated their desire to receive a copy. The cover letter advised the recipient of the process to submit comments on the DEIS, the time frames for submitting comments, the time and place of any planned public meetings, and the contact person for additional information. 40 Code of Federal Regulations 1502-1508 requires that a mandatory number of copies be sent to specific agencies.

A Notice of Availability of the DEIS was provided by the BLM to the Environmental Protection Agency to publish in the Federal Register. This Notice of Availability was reviewed by the BLM Nevada State Office, BLM Washington Office, and Department of Interior before being submitted to the Environmental Protection Agency. The publication date of the Notice of Availability began a minimum 45-day public comment period on the DEIS. The BLM also published a Notice of Availability for the DEIS in the same newspapers that published the Scoping Legal Notice. This notice announced the availability of the DEIS for review and comment and advised how to submit comments on the DEIS, the time frames for submitting comments, the time and place of any planned public meetings, and the contact person for additional information. A copy of the DEIS was made available on the BLM Ely District web page.

When the Notice of Availability for the DEIS was published, public meetings were held to receive comments on the draft. Each comment received on the DEIS was recorded and analyzed for its content to develop comment points. .Complete and objective responses to each public comment were developed as a separate section (Appendix C) of the FEIS. The content of the DEIS was modified as required to respond to substantive comments received and to develop the FEIS. The comments or public concern statements on the DEIS and the agencies' responses to same are included in the FEIS (Appendix C).

The FEIS was mailed to all those on the mailing list who have indicated their desire to receive a copy and to those who commented during scoping or on the DEIS. The FEIS cover letter briefly explains that a FEIS has been prepared for the BMM North Operations Area Project, describes whether it modifies or replaces the DEIS, describes any major changes in alternatives from the DEIS, and describes when the Record of Decision is anticipated to be released. 40 Code of Federal Regulation 1502-1508 requires that a mandatory number of copies be sent to specific agencies.

A Notice of Availability of the FEIS has been provided by the BLM to the U.S. Environmental Protection Agency to publish in the Federal Register in the same manner as described above for the DEIS and is posted on the BLM Ely District Office website.

The Record of Decision will be mailed to all those on the mailing list who have indicated their desire to receive a copy and to those who received the FEIS. The Record of Decision will include an explanation of the appeals process. A legal notice announcing the availability of the Record of Decision will be published in the same newspapers that published the Scoping Legal Notice. Any appeal of the Record of Decision filed by the public will be responded to in a timely manner.

5.3 List of Agencies, Organizations, and Persons to Whom Copies of this Statement are Sent

A hard copy or electronic version of the Bald Mountain Mine North Operations Area Project FEIS was sent to the individuals and organizations listed in Table 5-3. Hard copies of the FEIS were also available at the BLM Ely District office and at the BLM Egan Field Office web page.

TABLE 5-3 LIST OF RECIPIENTS TO RECEIVE THE FEIS

White Pine County Library	Washoe County Library
Wells Branch Library	Elko County Library
Eureka Branch Library	Karen Rajala White Pine County Economic Diversification Council
John Hadder Great Basin Resource Watch	Todd Suessmith Nevada Division of Environmental Protection
Richard A. Orr Sustainable Grazing Coalition	Nevada Department of Administration Nevada State Clearinghouse
Steven Tuttle	Martha Collins Ruby Lake National Wildlife Refuge
Tom Bath Bath Lumber Co.	Don Harris Midway Gold Corp.

Diane Rice Wells Fargo	Judy Overton Eureka County Department of Natural Resources
John Overton Eureka County Natural Resource Advisory Commission	Jim Ithurralde Eureka County Commissioners
Matt Zietlow Barrick Bald Mountain Mine	Bureau of Land Management Ely District Office
Bureau of Land Management Elko District Office	Bureau of Land Management Battle Mountain District Office
Brian Amme Bureau of Land Management Nevada State Office	Katie Miller Nevada Department of Wildlife
Terry Svalberg Bridger-Teton National Forest Pinedale Ranger District	Barbara Ott USFS Teams
Sue Howle USFS Teams	Office of Environmental Policy & Compliance Oakland Region
U.S. Environmental Protection Agency Office of Federal Activities	Gwen Wilder U.S. Department of the Interior Office of Environmental Policy & Compliance
U.S. Department of the Interior Natural Resources Library	U.S. Department of the Interior Office of NEPA
Bureau of Land Management Planning Office	National Operations Center Division of Resource Services
Bureau of Reclamation Denver Federal Center	Assistant Director, Endangered Species U.S. Department of the Interior Fish and Wildlife Service
Chief, Environment Operations & Analysis Branch U.S. Department of the Interior Minerals Management Service	Division of Environmental Compliance National Park Service
Environmental Affairs Program U.S. Geological Survey	Office of Deputy A/S of the USAF
Chief, Planning Division South Pacific Division U.S. Army Corps of Engineers	Office of Environmental Compliance
U.S. Department of the Interior Office of External & Intergovernmental Affairs	Advisory Council on Historic Preservation
Jeanne Geselbracht Environmental Protection Agency Region 9	State Historic Preservation Office
Nevada Office Director U.S. Fish and Wildlife Service	U.S. Department of the Interior Bureau of Land Management Washington Office
David Gonzales Te-Moak Tribe of the Western Shoshone	Renae Pete Cedar City Band of Paiutes
Rupert Steele Confederate Tribes of the Goshute Indian Reservation	Jeannine Borchardth Indian Peaks Band
Jerry Millet Duckwater Shoshone Tribe	Glenn Rogers Shivwits Band of Paiutes
Diane Buckner Ely Shoshone Tribe	Alfreda Mitre Las Vegas Paiute Tribe
Ona Sequndo Kaibab Band of Paiute Indians	Lora Tom Paiute Indian Tribe of Utah
John C Carpenter, Assemblyman Nevada State Legislature	Pete Goicoechea
John Hickman, Mayor City of Ely	Jane Feldman Sierra Club

Kathryn Landreth The Nature Conservancy	Jimmie Dale Lee
Stephen Marich City of Ely	Katie Fite Western Watersheds Project
Paul B. Aguirre NV Energy	Jerry Koglitz National Planning and Permitting Directory Technical Knowledge and Innovation
Valerie J. Randall AECOM Environmental	Larson R. Bill TeMoak South Fork and Western Shoshone Defense Project
Kenneth Moss	Emiliano McClane South Fork Band Environmental
Patrick Rogers	Larry Kibby Elko Indian Colony
South Fork Band Council South Fork Indian Reservation	Intentionally Left Blank

5.4 Persons, Groups, and Agencies Consulted

Barrick North America

Bob Brock	Nevada Lands Manager
Tasha Liebsack	Land Department
Ben Patterson	Ranch Manager
Steve Schoen	Manager of Permitting
Bill Upton	Environmental Director
Matt Zietlow	Environmental Manager

Elevation Technical Services

Rob Gelsky

Enviroscientists, Inc.

Rich Delong — President

Mine Mappers, Inc.

Steve Osterberg, Ph.D., P.G.

Native American Tribes Receiving Letters Soliciting Information

Ely Shoshone Tribe
Confederated Tribes of the Goshute Indian Reservation
Duckwater Shoshone Tribe
Cedar City Band of Paiutes
Te-Moak Tribes of the Western Shoshone
Kaibab Band of Paiute Indians
Indian Peaks Band
Shivwits Band of Paiute Tribe
Paiute Indian Tribe of Utah
Las Vegas Paiute Tribe
Te-Moak Tribe of the Western Shoshone-Elko Band
Te-Moak Tribe of the Western Shoshone-Wells Band

Natural Resource Conservation Service
Tom McKay — Senior Soil Scientist

Nevada Department of Employment, Training, and Rehabilitation
Jim Shabi

Parsons Behle and Latimer
Jim Butler

Schafer Limited LLC
William M. Schafer, Ph.D.

SRK Consulting, Inc.
Gary Back — Principal Ecologist
Val Sawyer — Principal Consultant

U.S. Fish and Wildlife Service
Marti Collins — Refuge Manager
Jeff Mackay — Wildlife Biologist

U.S. Forest Service, Humboldt-Toiyabe National Forest, Jarbidge and Ruby Mountains Ranger Districts
Dwayne Winslow — Wildlife Biologist

White Pine County Assessors Office
Bob Bishop

White Pine County Office of Economic Diversity
Karen Rajala

White Pine County Road Department
Kerry Sprouse — Superintendent

5.5 List of Preparers

TABLE 5-4 LIST OF PREPARERS AND QUALIFICATIONS

BUREAU OF LAND MANAGEMENT, EGAN FIELD OFFICE		
Lynn Bjorklund	Project Lead	MS Biology BS Biology and Agronomy 20 years' experience
Shawn M. Gibson	Cultural Resources and Paleontology	BS Geology BA and MA Archaeology (Anthropology) 11 years' experience
Chris Hanefeld	Public Relations	Associate Degree Applied Arts 23 years' experience
Kari Harrison	Soils, Surface Water, Water Quality, Wetland, Riparian	BS Soils Science 7 years' experience
Craig Hoover	Range	BS Range Management 10 years' experience
Kalem Lenard	Recreation, Visual Resources	BS Geography 5 years' experience

BUREAU OF LAND MANAGEMENT, EGAN FIELD OFFICE (CONTINUED)		
Marian Lichtler	Wildlife, Threatened and Endangered Species, Special Status Species, Migratory Birds	BS Natural Resources 17 years' experience
Doris Metcalf	Lands	AAS Office Administration 21 years' experience
Dan Netcher	Water, Groundwater	BS Geology 31 years' experience
Benjamin Noyes	Wild Horses	BS Agriculture Science 4 years' experience
Melanie Peterson	Hazardous Materials/Wastes	BAS Management in Technology 2 years' experience
Jake Rajala	Planning and Environmental Coordinator	MS Forest and Range Management MA Anthropology BA Anthropology 35 years' experience
Sheri Wysong	Planning and Environmental Coordinator	BS Anthropology 18 years' experience
Bonnie Million	Non-Native Invasive Species	BS Biology 7 years' experience
Elvis Wall	Native American Coordinator	BS Social Sciences/History 7 years' experience
Jeff Weeks	Field Manager, Egan Field Office	BS Range Ecology 30 years' experience
Bill Wilson	Geology	BS Geology 39 years' experience
U.S. FOREST SERVICE TEAMS ENTERPRISE (CONTRACTOR TO THE BLM)		
Susan Howle	USFS TEAMS Enterprise Project Co-Lead	MS Environmental Geography BS Geoscience 10 years' experience
Barbra Ott	USFS TEAMS Enterprise Socioeconomics	MS Management, with an emphasis in public administration and a special study of rural community planning BA Business Administration 13 years' experience doing social and economic analysis, 17 years in business management
Terry Svalberg	USFS TEAMS Enterprise Air Quality	BS Soil Science 20 years' experience as soil scientist and 9 years' experience in Air Quality
NEVADA DEPARTMENT OF WILDLIFE (COOPERATING AGENCY)		
Rory Lamp	Biologist, Wildlife Resources	27 years' experience
Katie Miller	Biologist, Eastern Region Mining Biologist	6 years' experience
Tony Wasley	Game Biologist	16 years' experience
Jason Williams	Non-game Biologist	
JBR ENVIRONMENTAL CONSULTANTS, INC. (CONTRACTOR TO THE BLM)		
Brian Boyd	Soils, Range, Wild Horses	BS Range Resource and Wildland Soil Science, minor in Geology 6 years' experience

JBR ENVIRONMENTAL CONSULTANTS, INC. (CONTRACTOR TO THE BLM) (CONTINUED)		
Brian Buck	Supporting Principal	BS Geology MS Geological Engineering 30 years' experience
Catherine Clark	Project Manager	BA Geography MS Environmental Resource Management 20 years' experience
Mark Demuth	EIS Technical Support	BS Education M Ed Education MS Environmental and Natural Resource Sciences 20 years' experience
Richard Duncan	Visual, Land Use, WSA, Socioeconomics, Environmental Justice	BA Economics MS Biology 10 years' experience
Dulcy Engelmeier	Administration, Formatting	15 years' experience
Heather Haan	Administration, Formatting	BA Journalism 5 years' experience formatting and editing
Dan Heiser	Noise, Air Quality	BS Chemical Engineering MBA University of Michigan 26 years' experience
Chris Johnson	Noise, Air Quality	BS Math/Earth Science 28 years' experience
Debbie Lassiter	Hazardous Materials	BS Economics in progress 15 years' experience
Kristi McKinnon	Vegetation, Threatened and Endangered Plant Species, Sensitive Species, Noxious Weeds	BS Land Rehabilitation, minor in Soils 5 years' experience
Tammy Odegard	Administrative Record	15 years' experience
Michael Ross	GIS, Drafting	BS Biology 3 years' drafting experience
Michael Derby	GIS, Drafting	BS Hydrogeology 5 years' drafting experience
Christine Johnson	GIS, Drafting	BS Geology 8 years' drafting experience
Stephanie Stoeberl	Water Resources, Geology, Paleontology	BS Environmental Geology MS Geochemistry 6 years' experience
Dave Worley	Wildlife, Threatened and Endangered Wildlife Species, Sensitive Species, Wetlands, Riparian	BS Biology MS Zoology 25 years' experience
Richard Weber	Assistant Project Manager	BS Biology MS Biology-Wildlife 18 years' experience
KAUTZ ENVIRONMENTAL CONSULTANTS, INC.		
Bob Kautz	Cultural Resources	BA Anthropology PhD Anthropology 20 years' experience

Chapter 6
References, Abbreviations, Acronyms, Glossary, and Index

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6.2 Abbreviations and Acronyms

BLM	Bureau of Land Management
BMM	Bald Mountain Mine
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act of 1969
USFS	United States Forest Service

6.3 Glossary

Act. The National Environmental Policy Act, as amended (42 U.S.C. 4321, et seq.), which is also referred to as "NEPA."

Acid mine drainage. Water from pits, underground workings, and waste rock containing free sulfuric acid. The formation of acid drainage is primarily due to the weathering of iron pyrite and other sulfur-containing minerals. Acid drainage can mobilize and transport heavy metals which are often characteristic of metal deposits.

Acre. A unit of land measure equal to 43,560 square feet.

Acre-foot. The amount of water or sediment volume which covers an acre of land to a depth of one foot; an acre-foot is equal to 325,851 gallons, or 43,560 cubic feet.

Affecting. Will or may have an effect on.

Animal Unit Month. The amount of forage required by one cow and calf, or their equivalent, for one month. Approximately 800 pounds of air-dried feed (26 pounds per day).

Aquifer. A zone, stratum, or group of strata acting as a hydraulic unit that stores or transmits water in sufficient quantities for beneficial use.

Cooperating Agency. Any federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment. The selection and responsibilities of a cooperating agency are described in Section 1501.6. A state or local agency of similar qualifications or, when the effects are on a reservation, an Indian Tribe, may by agreement with the lead agency become a cooperating agency.

Cumulative Impact. The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Darcy's Law. A generalized relationship of flow in porous media stating that the volumetric flow rate is a function of the flow area, elevation, fluid pressure, and a proportionality constant.

Deposit. A natural accumulation, such as precious metals, minerals, coal, gas, oil, etc., that may be pursued for its intrinsic value; gold deposit.

Designated basin. Groundwater basin where permitted groundwater rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration.

Dewatering. The removal or extraction of water from a pit, tunnel, or other conduit containing volumes of water.

Dike. A tabular body of igneous rock that cuts across the structure of adjacent rocks or cuts massive rocks.

Doré. Metal alloy composed of gold, silver, and other precious metals. Bullion containing unseparated metallic gold and silver.

Downgradient. In relation to any fixed point with regard to the direction of drainage or flow, downgradient is at a lower point of elevation than the chosen observation point and thus downward in relation to the direction of flow.

Drawdown. Vertical distance that a water elevation is lowered or the pressure head is reduced due to the removal of water from the same system.

Drill pad. An earthen platform/bench created to provide stable support for a drill rig during drilling activities.

Effects include:
(a) Direct effects, which are caused by the action and occur at the same time and place.

(b) Indirect effects, which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate and related effects on air, water, and other natural systems, including ecosystems.

Effects and impacts as used in these regulations are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

Environmental Document. Includes the documents specified in Sec. 1508.9 (environmental assessment), Sec. 1508.11 (environmental impact statement), Sec. 1508.13 (finding of no significant impact), and Sec. 1508.22 (notice of intent).

"Environmental impact statement" means a detailed written statement as required by section 102(2)(C) of the Act.

Ephemeral drainage. A channel or drainage that flows only in direct response to precipitation or snow melt. Such flow is usually of short duration.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents, including such processes as gravitation creep.

Exploration. The search for economic deposits of minerals, ore, gas, oil, or coal through the practices of geology, geochemistry, geophysics, drilling, shaft sinking, and/or mapping.

Feasible. Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Federal Agency. All agencies of the federal government. It does not mean the Congress, the Judiciary, or the President, including the performance of staff functions for the President in his Executive Office. It also includes, for purposes of these regulations, states and units of general local government and Indian tribes assuming NEPA responsibilities under section 104(h) of the Housing and Community Development Act of 1974.

Felsic. Igneous rocks having abundant light-colored minerals (quartz, feldspars, feldspathoids, muscovite).

Forage. All browse and non-woody plants that are available to livestock or game animals for grazing or harvestable for feed.

Fugitive dust. Dust particles suspended randomly in the air from road travel, excavation, and rock-loading operations.

Geochemistry. The study of the distribution and amounts of the chemical elements in minerals, ores, rocks, soils, water, and the atmosphere and their circulation in nature, on the basis of the properties of their atoms and ions.

Geotechnical. A branch of engineering that is essentially considered with the engineering design aspects of slope stability, settlement, earth pressures, bearing capacity, seepage control, and erosion.

Groundwater. Water found beneath the land surface in the zone of saturation below the water table.

Growth media. All materials, including topsoil, specified soil horizons, vegetative debris, and organic water, which are classified as suitable for stockpiling and/or reclamation.

Haul road. A road used by trucks that have a capacity of 50-tons or more to haul ore and waste rock from an open pit mine to other locations.

Heap leaching. An ore extraction method used for moderate to high grade ores; involves placing the ore-bearing materials in a mound and then "washing" by percolation of waters which dissolve constituents from the rock and thus extract soluble minerals.

Heavy metals. A group of elements, usually acquired by organisms in trace amounts, that are often toxic in higher concentrations; includes lead, mercury, molybdenum, nickel, copper, cobalt, chromium, iron, silver, etc.

High Density Polyethylene. A high density man-made material used for liners. This material deforms with a low probability of puncturing or splitting. Seams are heat welded instead of glued, thus preventing rupture.

Human Environment. Shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (Sec. 1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.

Hydraulic conductivity. A measure of the ability of rock or soil to permit the flow of groundwater under a pressure gradient; permeability.

Lead Agency. The agency or agencies preparing or having taken primary responsibility for preparing the environmental impact statement.

Leaching. The process of applying a chemical agent that bonds preferentially and dissolves into solution the precious metals in an ore. The precious metal complexes or binds to the solution, which is then called a "pregnant" solution. The pregnant solution is collected for processing to recover the precious metals.

Locatable minerals. Generally refers to hardrock minerals on Public Domain lands or National Forest System lands reserved from the Public Domain that are mined and processed to recover metals such as gold and copper, chemical grade limestone, and asbestos.

Long-term. The future beyond reclamation.

Major Federal Action. Includes actions with effects that may be major and which are potentially subject to federal control and responsibility. "Major" reinforces but does not have a meaning independent of "significantly" (Sec. 1508.27). Actions include the circumstance where the responsible officials fail to act and that failure to act is reviewable by courts or administrative tribunals under the Administrative Procedure Act or other applicable law as agency action.

(a) Actions include new and continuing activities, including projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies; new or revised agency rules, regulations, plans, policies, or procedures; and legislative proposals (Secs. 1506.8, 1508.17). Actions do not include funding assistance solely in the form of general revenue-sharing funds distributed under the State and Local Fiscal Assistance Act of 1972, 31 U.S.C. 1221 et seq. with no federal agency control over the subsequent use of such funds. Actions do not include bringing judicial or administrative civil or criminal enforcement actions.

(b) Federal actions tend to fall within one of the following categories:
Adoption of official policy, such as rules, regulations, and interpretations adopted pursuant to the Administrative Procedure Act, 5 U.S.C. 551 et seq.; treaties and international conventions or agreements; formal documents establishing an agency's policies which will result in or substantially alter agency programs.

Adoption of formal plans, such as official documents prepared or approved by federal agencies which guide or prescribe alternative uses of federal resources, upon which future agency actions will be based.

Adoption of programs, such as a group of concerted actions to implement a specific policy or plan; systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive.

Approval of specific projects, such as construction or management activities located in a defined geographic area. Projects include actions approved by permit or other regulatory decision as well as federal and federally assisted activities.

Material balance. A calculation of material inputs versus outputs in a process system. The law of conservation is assumed by which mass cannot be destroyed or created spontaneously.

Milling. The general process of separating the valuable constituent (gold) from the undesired or non-economic constituents of the ore material.

Mine pit. Surface area from which ore and waste rock are removed.

Mineral entry. The filing of a mining claim upon Public Domain or related land to obtain the right to any minerals it may contain. Valid mining claims may be purchased in full (patented) under the 1872 mining law, as amended.

Mining claim. A portion of the Public Domain or related lands which a miner, for mining purposes, takes and holds in accordance with mining laws.

Mitigation. Mitigation includes:
(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

NEPA Process. All measures necessary for compliance with the requirements of section 2 and Title I of NEPA.

Nexus. Used in this document in the context of determining whether a tributary stream is protected under the Clean Water Act. A significant nexus analysis assesses the flow characteristics and functions of the tributary and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters. The assessment also considers hydrologic and ecologic factors.

Non-designated Basin. Not a Designated Basin (see definition for Designated Basin).

Notice of Intent. A notice that an environmental impact statement will be prepared and considered. The notice shall briefly:

(a) Describe the proposed action and possible alternatives.

(b) Describe the agency's proposed scoping process including whether, when, and where any scoping meeting will be held.

(c) State the name and address of a person within the agency who can answer questions about the proposed action and the environmental impact statement.

"Proposal" exists at that stage in the development of an action when an agency subject to the Act has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated. Preparation of an environmental impact statement on a proposal should be timed (Sec. 1502.5) so that the final statement may be completed in time for the statement to be included in any recommendation or report on the proposal. A proposal may exist in fact as well as by agency declaration that one exists.

Open pit mining. A type of mining that involves excavation of the ore or minerals above ground by removing the overburden and extracting the mineral beneath. The result of the mining operation is an "open pit."

Ore. A mineral or group of minerals present in sufficient value as to quality and quantity which may be mined at a profit.

Patented claims. Private land which has been secured from the U.S. Government by compliance with the laws relating to such lands.

Permeability. The property or capacity of a porous rock, sediment, or soil for transmitting a fluid; it is a measure of the relative ease of fluid flow under unequal pressure.

pH. Symbol for the negative common logarithm of the hydrogen ion concentration (acidity) of a solution. The pH value of 7 is considered neutral. A pH value below 7 indicates acidity, and a pH value above 7 indicates alkalinity or a base.

Plan of Operations. A detailed description presenting the methods, timing, and contingencies to be used during the operation of the Project. A document required from any person proposing to conduct mineral-related activities which utilize earth-moving equipment and which will cause disturbance to surface resources.

Potentiometric surface. The surface that represents the level to which water will rise in a tightly cased (sealed) well.

Precious metal. Any of the less common and highly valuable metals; gold, silver, platinum.

Pregnant solution. The resulting metal-laden solution collected from the leaching process which contains dissolved metal values. The precious metals values are recovered from this pregnant solution, which then becomes the barren solution that is typically refortified and reintroduced to the leaching circuit.

Reclamation. Returning disturbed land to a form and productivity in conformity with a predetermined land management plan or a government-approved plan or permit.

Record of Decision. A document separate from but associated with an Environmental Impact Statement which states the decision, identifies all alternatives, specifying which were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternative have been adopted and, if not, why not (40 CFR 1505.2).

Relationships between short-term use and long-term productivity. Relationships which tie short-term use to the long-term condition and viability of a given resource value (an example would be the long-term effects of overgrazing on range productivity and condition).

Rock disposal area. Also called waste rock disposal area or stockpile area; an area where waste rock (loose or consolidated rock material that overlies a mineral deposit) is placed during mining either temporarily or permanently.

Scope. Consists of the range of actions, alternatives, and impacts to be considered in an environmental impact statement. The scope of an individual statement may depend on its relationships to other statements (Secs.1502.20 and 1508.28). To determine the scope of environmental impact statements, agencies shall consider three types of actions, three types of alternatives, and three types of impacts. They include:

(a) Actions (other than unconnected single actions) which may be:
Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:
(i) Automatically trigger other actions which may require environmental impact statements.
(ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
(iii) Are interdependent parts of a larger action and depend on the larger action for their justification.

Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.

Similar actions, which, when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement.

(b) Alternatives, which include:
No action alternative.
Other reasonable courses of actions.
Mitigation measures (not in the proposed action).

(c) Impacts, which may be: (1) Direct; (2) indirect; (3) cumulative.

Sensitive Receptor. A property or areas where impacts to the site could affect existing (or formally and definitive planned) populations or ecological areas especially sensitive to impacts. *For this report this definition refers to air, noise, and visual resources.*

Short-term. Short-term is defined as the life of the Proposed Action through closure and reclamation (2020).

Significantly. As used in NEPA, requires considerations of both context and intensity:
(a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.

2) The degree to which the proposed action affects public health or safety.

3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a

cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

10) Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

Sill. A tabular igneous intrusion that parallels the planar structure of the surrounding rock.

Stock. An igneous intrusion that is less than 40 square miles in surface exposure, is usually but not always discordant, and resembles a batholith except in size.

Stockpile. An accumulation of ore, stone, or other mined or quarried material.

Surface water. Water found in ponds, lakes, inland seas, streams, and rivers or above the ground surface.

Third-party contractor. An independent firm contracted by a government agency to perform work related to a proposed action or another organization; due to the financial and contractual arrangements governing such relationships, the third-party contractor has no financial or other interest in the decision to be reached on the project.

Transmissivity. The rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient.

Undesignated Basin. Groundwater basin where permitted groundwater rights are less than the estimated average annual recharge.

Upgradient. In relation to any fixed point with regard to the direction of drainage or flow, upgradient is at a higher point of elevation than the chosen observation point and thus upward in relation to the direction of flow.

Volcanic Intrusive. Igneous rock that has intruded into a pre-existing rock formation, usually occurs while intrusive rock is in magma form.

Waste rock. A non-ore rock that is removed to access the ore zone. It contains no gold or contains gold below the economic cutoff level and must be removed to gain access to the ore zone.

Watershed. The entire land area that contributes water to a particular drainage system or stream.

6.4 Index

APPENDIX A

Relevant Plans, Regulations, Executive Orders, and Manuals

Appendix A Relevant Plans, Regulations, Executive Orders, and Manuals

Bureau of Land Management (BLM). 1984. Proposed Egan Resource Management Plan and Final Environmental Impact Statement. Prepared by the U.S. Department of the Interior, Bureau of Land Management, Ely Field Office, Ely, Nevada. September 21, 1984.

Bureau of Land Management (BLM). 1986. Visual Resource Inventory Handbook: H-8410-1, U.S. Department of the Interior, Bureau of Land Management. January 17, 1986.

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Bureau of Land Management (BLM). 1992. U.S. Department of the Interior, Bureau of Land Management Manual 9015-Integrated Weed Management. December 2, 1992.

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Council on Environmental Quality. Regulations for Implementing the National Environmental Policy Act. 40 Code of Federal Regulations parts 1500 through 1508.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. Federal Register 59:32.

Executive Order 13045, Protection of Children from Environmental Risks and Safety. Federal Register 62:78.

Executive Order 13077, Indian Sacred Sites. Federal Register 63:48.

Executive Order 13112, Invasive Species. Federal Register 64:25.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. Federal Register 66:11.

Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation. Federal Register 72:160.

Federal Highway Administration Highway Construction Noise Handbook. 2006. FHWA-HEP-06.015. August 2006.

National Environmental Policy Act. 42 United States Code Chapter 55 Sections 4321-4327.

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White Pine County. 2007. Elk Management Plan 2007 Revision.

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U.S. Department of the Interior (USDI). 1918. Migratory Bird Treaty Act of 1918, 16 U.S.C. 703-712. U.S. Fish and Wildlife Service.

U.S. Environmental Protection Agency (EPA). 1998. Final Guidance for Incorporating Environmental Justice Concerns in the U.S. Environmental Protection Agency's National Environmental Policy Act Compliance Analyses. Washington D.C. Available at http://www.epa.gov/compliance/resources/policies/ej/ej_guidance_nepa_epa0498.pdf

U.S. Environmental Protection Agency (EPA). 1981. Office of Noise Abatement and Control. Noise Effects Handbook EPA 500-9-82-106, National Association of Noise Control Officials, Fort Walton Beach, Florida.

APPENDIX B

Public Scoping Documents

Alternative, the BLM would not issue a ROW grant for the OP Pipeline. The project, including the pipeline, temporary access roads, and temporary use areas during construction, would not be approved or authorized as described in the ROW application. The BLM's preferred alternative is the Proposed Action Alternative. The Proposed Action Alternative analyzed in the DEIS reflects minor revisions to the original route as proposed by Overland Pass Company. The Southern Energy Corridor Alternative reflects the Green River Resource Management Plan's preferred locations for future proposed ROWS. Other alternatives, including transportation system alternatives and route variations, were considered, but not studied in detail.

The DEIS analyzes the potential environmental consequences of granting Overland Pass Company a ROW to construct an approximately 760-mile pipeline that would transport NGLs from Opal, Wyoming, to its terminus at the company's existing facilities in Conway, Kansas. The pipeline would be approximately 14 inches in diameter between Opal and Echo Springs, Wyoming, and 16 inches in diameter from Echo Springs, Wyoming, to Conway, Kansas.

As part of the proposed action, the OP Pipeline would be routed across southern Wyoming from Opal to Echo Springs along various existing utility or pipeline ROWs. From Echo Springs, the pipeline ROW would run in a southeasterly direction, paralleling the existing Southern Star Pipeline, and proceed to the south of Cheyenne, Wyoming, before entering Colorado. A major portion of the proposed route in Wyoming would cross public lands administered by the BLM.

From the Colorado border, the pipeline ROW would continue to parallel Southern Star Pipeline southeasterly crossing the Pawnee National Grassland, which is administered by the USDA Forest Service, and then into Kansas. From the Colorado-Kansas state line, the OP Pipeline would continue to run parallel to the Southern Star Pipeline to south of WaKeeney, Kansas. It would then follow an existing BP Amoco pipeline to Bushton, Kansas. From this point, the OP Pipeline would not parallel existing pipelines until reaching Mitchell, Kansas, where it would then follow an existing Williams Pipeline to the termination point at Conway, Kansas.

At Bushton and Conway, Kansas, the transported NGL would be processed at existing facilities and distributed through an existing transportation infrastructure to consumer markets in the Midwest and Texas Gulf of Mexico coast. About 82 percent of the proposed 760-mile pipeline would be co-located within existing pipeline ROW corridors. In addition to the pipeline, three electric pump stations would be needed to move the NGL at a maximum pressure of 1,440 pounds per square inch gauge (psig) through the pipeline. The pump stations are proposed to be located near Echo Springs and Laramie, Wyoming, and near WaKeeney, Kansas. The pipeline would have manual or self-actuating shut-off valves at regular intervals, as well as cleaning facilities and meter stations.

The OP Pipeline would be constructed and installed within a 75-foot-wide construction area. After construction and reclamation, the permanent ROW would be 50 feet wide, centered on the pipeline. All temporary workspace areas needed for construction activities outside the 50 foot wide permanent ROW would require Temporary Use Permits.

All comment submittals must include the commenter's name and street address. Comments, including the names and street addresses of respondent, will be available for public review at the Rawlins Field Office during its business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except for Federal holidays. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Dated: February 21, 2007.

Robert A. Bennett,

State Director.

[FR Doc. E7-5575 Filed 3-29-07; 8:45 am]

BILLING CODE 4310-22-P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[NV-040-07-5110-CF05 1990-EX-1990; N82888]

Notice of Intent To Prepare an Environmental Impact Statement for an Expansion of Mining Operations at Barrick Gold Corporation's Bald Mountain and Money Basin Mines, NV

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice of Intent.

SUMMARY: In accordance with section 102(2)(c) of the National Environmental Policy Act of 1969 and 43 CFR part 3809, the Bureau of Land Management (BLM) Ely Field Office, Nevada intends to prepare an Environmental Impact Statement (EIS) for a proposed consolidation and expansion of the existing Plans of Operation for Barrick Gold Corporation's Bald Mountain Mine and Mooney Basin Mine located in White Pine County, Nevada. The two existing mines would be combined into one new expanded operation which would be called the North Operations Area. The EIS will analyze anticipated impacts of the expansion under this new consolidated Plan of Operation, and will incorporate analysis from a previous EIS and environmental assessments associate with the existing disturbance.

DATES: Publication of this notice initiates the public scoping process. Scoping meetings will be held in Ely, Elko, and Eureka, Nevada. All public meetings will be announced through local news media, newsletters or flyers, and will be posted on the BLM Web site, *http://www.nv.blm.gov/ely/2007_releases.htm* at least 15 days prior to each event.

The minutes and list of attendees for each meeting will be available to the public and open for 30 days after the meeting to any participants who wish to clarify the views they expressed. Comments and resource information should be submitted to the BLM within 30 days of publication of this notice in the Federal Register.

ADDRESSES: You may submit comments by any of the following methods:

- *E-mail: lynn_bjorklund@nv.glm.gov.*
- *Fax:* 775-189-1910.
- *Mail:* Bureau of Land Management, Ely Field Office, Attention: Lynn Bjorklund, HC33 Box 33500, Ely, Nevada, 89301.

Documents pertinent to this proposal may be examined at the Ely Field Office.

FOR FURTHER INFORMATION CONTACT: For further information and/or to have your name added to our mailing list, contact Lynn Bjorklund, Ely Field Office, at 775 289-1893 or by e-mail to *lynn_bjorklund@nv.blm.gov.*

SUPPLEMENTARY INFORMATION: Barrick Gold Corporation has submitted a proposal to expand and consolidate their existing Bald Mountain and Mooney Basin Mines, which are located approximately 65 air miles northwest of the town of Ely, Nevada. The project (consolidating the existing Bald Mountain Mine N-68193 and Mooney

Basin Mine N–46–94–010P into one unified operation called the North Operations Area) would consist of extending existing open pits, expanding existing rock disposal areas and heap leach facilities, construction of a truck shop, and continuing the operation, reclamation, and closure of the existing Bald Mountain Mine and Mooney Basin Mine operations (to include mine offices, truck shops/warehouse, haul roads, ore stockpiles, access roads, diversion ditches, power transmission lines, water wells and pipelines, process solution transmission pipelines and a landfill). This proposed expansion is entirely on unpatented mining claims on BLM-administered public land. Project access would continue to be via existing public roads. The projected life of the existing mine operation would increase approximately 10 years under this proposed project.

Under the proposed action, there would be an additional disturbance of 3,808 acres. The BLM previously authorized Barrick Gold Corporation to disturb 3,418 acres within the Bald Mountain Mine Plan boundary and 742 acres within the Mooney Basin Plan boundary (for a total of approximately 4,160 acres) associated with pits, rock disposal areas, heap leaching, roads, growth media stockpiles, exploration, and underground mining activities. The Proposed North Operations Area would include the 4,160 acres of previously permitted disturbance and 3,808 acres of new disturbance, for a final disturbance footprint of 7,968 acres. The North Operations Area EIS would incorporate existing analysis that includes several environmental assessments and the 1995 Bald Mountain Mine Expansion EIS.

Combining the Mooney Basin Mine and the Bald Mountain Mine into one project area would result in the new North Operations Area project boundary expanding to include an additional 3,738 acres of public land. The original boundaries of the two mines encompassed 12,737 acres of public land. The proposed project boundary for the North Operations Area would encompass 16,475 acres. These project boundaries define an area of potential operations although not all of the acreage within these boundaries would be disturbed.

The purpose of the public scoping process is to determine relevant issues that will influence the scope of the environmental analysis and EIS alternatives. Federal, state, and local agencies, and other individuals or organizations that may be interested in or affected by the BLM's decision on this Plan of Operations amendment are invited to participate in the scoping process. To be most helpful, you should submit formal scoping comments within 30 days after publication of this notice in the **Federal Register**.

Individual respondents may request confidentiality. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so. All submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses will be available for public inspection in their entirety. The minutes and list of attendees for each public meeting will be available to the public and open for 30 days after the meeting to any participants who wish to clarify the views they expressed. All comments will be available to the public for review at the Ely Field Office BLM throughout the EIS process.

Potentially significant direct, indirect, residual, and cumulative impacts from the proposed action will be analyzed in the EIS and will include wildlife, BLM sensitive species, socioeconomics, and cultural resources. Additional issues to be addressed may arise during the scoping process.

Dated: February 26, 2007.

John R. Ruhs,

Field Manager.

[FR Doc. 07–1589 Filed 3–29–07; 8:45 am]

BILLING CODE 4310–HC–M

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[CACA 14340]

Notice of Proposed Withdrawal Extension and Opportunity for Public Meeting; California

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice.

SUMMARY: The Forest Service has filed an application with the Bureau of Land Management (BLM) that proposes to extend the duration of Public Land Order (PLO) No. 6652 for an additional 20-year term. PLO No. 6652 withdrew 30 acres of National Forest System land from the mining laws, but not from other forms of disposition as may by law be authorized on National Forest System land or the mineral leasing laws to protect the Petersburg Administrative Site in Siskiyou County. This notice also gives an opportunity to comment on the proposed action and to request a public meeting.

DATES: Comments and requests for a public meeting must be received by June 28, 2007.

ADDRESSES: Comments and meeting requests should be sent to Duane Marti, BLM California State Office, 2800 Cottage Way, Sacramento, California 95825.

FOR FURTHER INFORMATION CONTACT: Duane Marti, BLM California State Office, (916) 978–4675, or at the above address and Jan Ford, Klamath National Forest, (530) 841–4483.

SUPPLEMENTARY INFORMATION: The withdrawal created by PLO No. 6652 (52 FR 27552) will expire on July 21, 2007, unless extended. The Forest Service has filed an application requesting the Secretary of the Interior to extend PLO No. 6652 for an additional 20-year term. The withdrawal was made to protect the Petersburg Administrative Site of the Forest Service on National Forest System land described as follows.

Klamath National Forest

Mount Diablo Meridian

T. 38 N., R. 11 W.,

Sec. 34, E½E½SW¼SW¼ and W½SE¼SW¼.

The area described contains 30 acres in Siskiyou County.

The purpose of the proposed extension is to continue the withdrawal created by PLO No. 6652 for an additional 20-year term to protect the Petersburg Administrative Site.

The use of a right-of-way, interagency, or cooperative agreement would not provide adequate protect of the Federal investment.

There are no suitable alternative sites as the land described contains permanent Federal facilities.

No additional water rights would be needed to fulfill the purpose of the requested withdrawal extension.

Records relating to the application may be examined by contacting Curt Hughes at the above address or 530–842–6131.

For a period of 90 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed extension may present their views in writing to the Forest Supervisor, Klamath National Forest, at the address noted above.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Ely Field Office
HC 33 Box 33500 (702 No. Industrial Way)
Ely, Nevada 89301-9408
http://www.nv.blm.gov/

In Reply Refer To:
380910 NV040
N82888

Dear Interested Public:

The Ely Field Office Bureau of Land Management (BLM), is asking for the public's input in the preparation of an Environmental Impact Statement (EIS) for the consolidation and expansion of the Bald Mountain and Mooney Basin Mines in White Pine County, Nevada. The two mines would be combined into one plan of operation called the North Operations Area and would include the proposed expansion of existing features. This project is more fully described in the accompanying project description.

The EIS will analyze the proposed actions/development projects to determine possible effects on the human environment and natural and cultural resources, and to determine what measures would be necessary to mitigate or reduce any impacts.

Three public scoping meetings will be held between 6:00 and 8:00 p.m. at locations within proximity to the Project Area. The open houses will include displays explaining the project and a forum for commenting on the project. The meeting will be held as follows:

Elko	Eureka	Ely
Monday, May 7	**Tuesday, May 8**	**Wednesday, May 9**
BLM Field Office	Eureka Opera House	BLM Field Office
3900 Idaho St.	31 South Main	701 North Industrial Way
Elko, Nevada	Eureka, Nevada	Ely, Nevada

If you would like to remain on the mailing list for this project, receive a copy of the EIS when it is completed, and be notified of future public meetings, please complete the enclosed comment form and return it to the BLM address shown.

The public scoping period for this project began on March 31 with the publication of the Notice of Intent in the Federal Register. It will conclude on May 25, 2007. You may direct questions and send written comments to:

Lynn Bjorklund,
Bureau of Land Management, Ely Field Office
HC 33 Box 33500,
Ely, Nevada 89301.
Phone 775-289-1893.

Sincerely,

John F. Ruhs
Field Manager
Ely Field Office

Enclosure: Project Description

Comments, including names, street addresses e-mail addresses, and phone numbers of respondents will be available for public review at the BLM Ely Field Office during regular business hours (7:30 a.m. to 4:30 p.m), Monday through Friday, except holidays. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that you entire comment – including you personal identifying information –may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. All submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses will be available for public inspection in their entirety. The minutes and list of attendees for each public meeting will be available to the public and open for 30 days after the meeting to any participants who wish to clarify the views they expressed. All comments will be available to the public for review at the Ely Field Office BLM throughout the EIS process.

Project Description
North Operations Area EIS
Barrick Gold Corporation

Barrick Gold Corporation has submitted a proposal to expand and consolidate their existing Bald Mountain and Mooney Basin Mines, which are located approximately 65 air miles northwest of the town of Ely, Nevada. The project (consolidating the existing Bald Mountain Mine N-68193 and Mooney Basin Mine N-46-94-010P into one unified operation called the North Operations Area) would consist of extending existing open pits, expanding existing rock disposal areas and heap leach facilities, construction of a truck shop, and continuing the operation, reclamation, and closure of the existing Bald Mountain Mine and Mooney Basin Mine operations (to include mine offices, truck shops/warehouse, haul roads, ore stockpiles, access roads, diversion ditches, power transmission lines, water wells and pipelines, process solution transmission pipelines and a landfill). This proposed expansion is entirely on unpatented mining claims on BLM-administered public land. Project access would continue to be via existing public roads. The projected life of the existing mine operation would increase approximately 10 years under this proposed project.

Under the proposed action, there would be an additional disturbance of 3,808 acres. The BLM previously authorized Barrick Gold Corporation to disturb 3,418 acres within the Bald Mountain Mine Plan boundary and 742 acres within the Mooney Basin Plan boundary (for a total of approximately 4,160 acres) associated with pits, rock disposal areas, heap leaching, roads, growth media stockpiles, exploration, and underground mining activities. The Proposed North Operations Area would include the 4,160 acres of previously permitted disturbance and 3,808 acres of new disturbance, for a final disturbance footprint of 7,968 acres. The North Operations Area EIS would incorporate existing analysis that includes several environmental assessments and the 1995 Bald Mountain Mine Expansion EIS.

Combining the Mooney Basin Mine and the Bald Mountain Mine into one project area would result in the new North Operations Area project boundary expanding to include an additional 3,738 acres of public land. The original boundaries of the two mines encompassed 12,737 acres of public land. The proposed project boundary for the North Operations Area would encompass 16,475 acres. These project boundaries define an area of potential operations although not all of the acreage within these boundaries would be disturbed.

The purpose of the public scoping process is to determine relevant issues that will influence the scope of the environmental analysis and EIS alternatives. Federal, state, and local agencies, and other individuals or organizations that may be interested in or affected by the BLM's decision on this Plan of Operations amendment are invited to participate in the scoping process. You should submit formal scoping comments by May 25, 2007

Potentially significant direct, indirect, residual, and cumulative impacts from the proposed action will be analyzed in the EIS and will include wildlife, BLM sensitive species, socioeconomics, and cultural resources. Additional issues to be addressed may arise during the scoping process

Preliminary Resources Issues

The BLM will prepare an environmental Impact Statement (EIS) for this proposal. The EIS will address Project –induced impacts related to the following natural and human resources (not necessarily in order of importance):

Aesthetics (visual and noise);
Air quality;
Cultural resources
Native American concerns;
Environmental justice;
Geology and minerals;
Hazardous materials;
Invasive, nonnative species;
Land use and access;
Paleontological resources;
Range resources;
Recreation;
Social and economic values;
Soils;
Special status plant and animal species;
Vegetation resources;
Water quality and quantity;
Wetland/Riparian Zones and Waters of the United States (U.S.);
Wild horses; and
Wildlife (including Migratory Birds).

Staying Informed and Involved

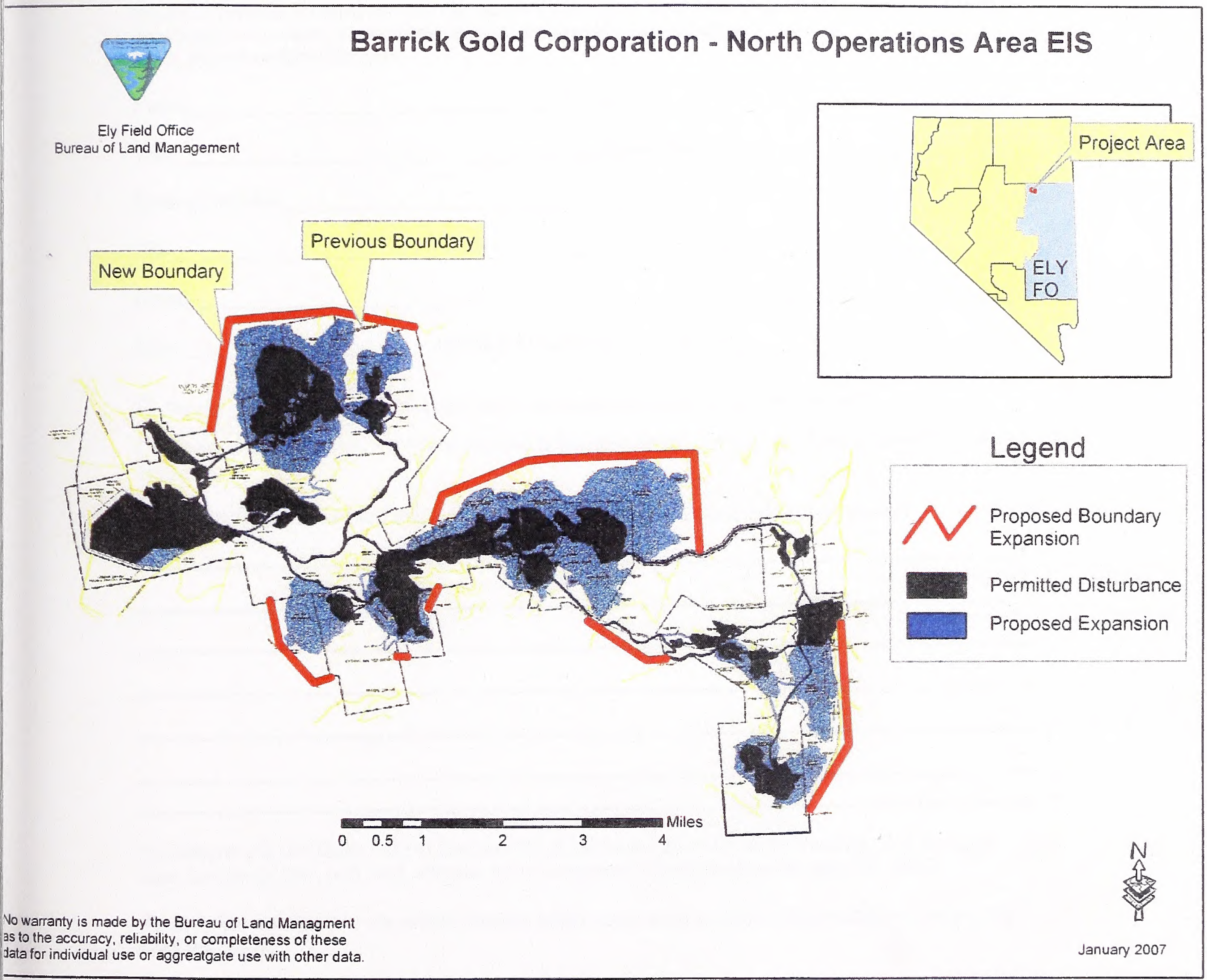
Information notices will be printed in the local newspapers and released to other news media informing the public of comment periods associated with scoping this Project and the release of the Draft EIS and Final EIS. Date, time, and location of these public meetings/open houses will be published in area newspapers.

The BLM will also develop a mailing list for this Project. Those persons and agencies on the mailing list will be contacted from time to time during the Project to provide status updates on the Project and distribute copies of the EIS. Persons wishing to be included in the mailing list may contact the Project contact shown below.

How to Comment

Persons wishing to comment on this proposal may do so by sending comments to the following address:

Lynn Bjorklund
Bureau of Land Management, Ely Field Office
HC 33 Box 33500
Ely, Nevada 89301
Tel (774) 289-1893 Email: Lynn_Bjorklund@nv.blm.gov


Barrick Gold Corporation - North Operations Area EIS
Ely Field Office
Bureau of Land Management
Project Area
ELY
FO
Previous Boundary
New Boundary
Legend
Proposed Boundary Expansion
Permitted Disturbance
Proposed Expansion
0 0.5 1 2 3 4 Miles
N
No warranty is made by the Bureau of Land Managment as to the accuracy, reliability, or completeness of these data for individual use or aggreatgate use with other data.
January 2007

BLM SCOPING COMMENT SHEET

Informed decisions are better decisions: The Bureau of Land Management (BLM) believes that extensive public involvement will serve to improve communication, develop enhanced understanding of different perspectives, and identify solutions to issues and problems. We look forward to hearing from you!

Where to provide comments: You can hand this form in at a public scoping meeting or mail it in using the address on reverse. ***Comments can also be provided via email to: Lynn_Bjorklund@nv.blm.gov.***

Name________________________________County_______________________________

Title________________________________Organization___________________________

Mailing Address____

City___________________ State ________________Zip___________________

Email____

Date ___________________ Meeting Location (if applicable)_______________________

☐ Please check box if you do **not** want your name released when comments are made public.

☐ Please check box if you want to receive the notice of availability of the draft Environmental Impact Statement.

COMMENT *(use back side if you need additional space or attach additional sheets)*

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To Return via US Mail: Fold in thirds so BLM address (on reverse) is showing, add postage, tape bottom of fold, and mail. ***Please have comments postmarked by May 25, 2007.***

To provide comments via email: Please email comments to: Lynn_Bjorkund@nv.blm.gov ***by May 25, 2007.***

Comments, including names, street addresses, e-mail addresses, and phone numbers (if provided) of respondents will be available for public review at the BLM Ely Field Office during regular business hours (8:00 am to 4:30 pm), Monday through Friday, except holidays. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Thank you for your comment!

To return via mail:

Fold in thirds so BLM address (above) is showing,
add postage, tape bottom of fold, and mail.

Please postmark by: May 25, 2007

Comment continued:

From:

____

____

____

Place

Stamp

Here

Lynn Bjorklund
Bureau of Land Management
Ely Field Office
HC 33 Box 33500
Ely, Nevada 89301

BLM News

ELY FIELD OFFICE NO. 07-028
FOR RELEASE: Tuesday, April 10, 2007
CONTACT: Chris Hanefeld (775) 289-1842

BLM Seeks Public Input on Bald Mountain Mine – North Operations Area EIS

The Bureau of Land Management (BLM) Ely Field Office is asking for the public's input in preparing an Environmental Impact Statement (EIS) for the consolidation and expansion of the Bald Mountain and Mooney Basin Mines in White Pine County, Nev. The two mines would be combined into one plan of operation called the North Operations Area and would include the proposed expansion of existing features.

The BLM has scheduled three public scoping meetings in Nevada, from 6 p.m. to 8 p.m. Dates and locations are: Monday, May 7, BLM Elko Field Office, 3900 East Idaho Street, Elko; Tuesday, May 8, Eureka Opera House, 31 South Main, Eureka; and Wednesday, May 9, BLM Ely Field Office, 702 North Industrial Way, Ely.

The EIS will evaluate the potential impacts that expanding mining operations may have on human, natural and cultural resources, as well as determine what measures would be necessary to mitigate or reduce the impacts.

The expansion would include the extension of existing open pits, expansion of existing rock disposal areas and heap leach facilities, and construction of a truck shop, as well as the continued operation, reclamation, and closure of the existing Bald Mountain and Mooney Basin mining operations, including mine offices, truck shops and warehouse, haul roads, ore stockpiles, access road, diversion ditches, power transmission lines, water wells and pipelines, process solution transmission pipelines and landfill.

Under the proposed action, there would be an additional disturbance of 3,808 acres. The proposed disturbance is on unpatented mining claims on BLM-administered public land. Project access will continue to be via existing public roads.

The BLM previously authorized Barrick Gold Corporation to disturb 3,418 acres within the Bald Mountain Mine Plan boundary and 742 acres within the Mooney Basin Mine Plan boundary for a total of approximately 4,160 acres associated with pits, rock disposal areas, heap leaching, roads, growth media stockpiles, exploration, and underground mining activities. The Mooney Basin Mine and the Bald Mountain Mine have been previously analyzed in environmental assessments from 1983 through 2006 as well as the 1995 Bald Mountain Mine Expansion Project Environmental Impact Statement. The size and scope of the new proposal, as well as length of time since the ROD was signed, requires that a new EIS be developed to analyze the proposed expansion.

(more)

BLM Nevada News

ELY FIELD OFFICE NO. 2007-034
FOR RELEASE: Wednesday, May 2, 2007
CONTACT: Chris Hanefeld, (775) 289-1842; chanefel@nv.blm.gov

BLM Seeks Public Participation on Bald Mountain Mine – North Operations Area EIS

Bureau of Land Management (BLM) Ely Field Office and Barrick Gold Corporation representatives are scheduled to meet with the public from 6 p.m. to 8 p.m., Wednesday, May 9, at the BLM Ely Field Office, 702 North Industrial Way, in Ely, Nev., to get input on the proposed consolidation and expansion of the Bald Mountain Mine and Mooney Basin operations.

The North Operations Area Environmental Impact Statement (EIS) will evaluate the potential impacts that expanding the Bald Mountain Mine and Mooney Basin operations may have on human, natural and cultural resources, as well as determine what measures would be necessary to mitigate or reduce the impacts. These two adjacent mines (Bald Mountain Mine and Mooney Basin Mine) will be combined into one plan of operation called the North Operations Area.

The expansion would include the extension of existing open pits, expansion of existing rock disposal areas and heap leach facilities, and construction of a truck shop, as well as the continued operation, reclamation, and closure of the existing Bald Mountain Mine and Mooney Basin operations, including mine offices, truck shops and warehouse, haul roads,.ore stockpiles, access road, diversion ditches, power transmission lines, water wells and pipelines, process solution transmission pipelines and landfill.

Under the proposed action, there would be an additional disturbance of 3,808 acres. The proposed disturbance is on unpatented mining claims on BLM-administered public land. Project access will continue to be via existing public roads.

The formal public scoping process concludes at 5 p.m., Friday, May 25, 2007. Interested individuals should address all written comments to the BLM Ely Field Office, HC 33 Box 33500, Ely, Nev., 89301.

For more information, contact Project Manager Lynn Bjorklund, at (775) 289-1893 or at Lynn_Bjorklund@nv.blm.gov.

- BLM -

GREAT BASIN MINE WATCH
505 S ARLINGTON AVE STE 110
RENO, NV 89509

MS JANILLE BAKER
GREAT BASIN NATIONAL PARK
BAKER, NV 89311

MR DOUG CARRIGER
LINCOLN COUNTY MANAGER
PO BOX 685
PIOCHE, NV 89043

TRIBAL COUNCIL
SUMMIT LAKE PAIUTE TRIBE
655 ANDERSON ST
WINNEMUCCA, NV 89445-3657

JACK BARNETT
COLO RIVER BASIN SALINITY CONTROL FORU
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BOUNTIFUL, UT 84010

MR STEVEN CARTER
CARTER CATTLE COMPANY
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LUND, NV 89317-0027

CLEARINGHOUSE COORDINATOR
NEVADA STATE CLEARINGHOUSE
209 E MUSSER ST RM 200
CARSON CITY, NV 89701-4298

MR ROBERT A BENNETT
SAGA EXPLORATION INC
PO BOX 6479
RENO, NV 89513-6479

MR PHILIP J CARTER
CARTER CATTLE CO CARTER AGRI SYSTEMS
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LUND, NV 89317

LINCOLN COUNTY COMMISSION
LINCOLN COUNTY PLACE
PIOCHE, NV 89043

MS KATHY BILLINGS
GREAT BASIN NATIONAL PARK
BAKER, NV 89311

MR TERRY CHUTE
USDA FOREST SERVICE
PO BOX 246
WELLS, NV 89835

PUBLIC LAND USERS ADVISORY COMMITTEE
801 CLARK ST STE 4
ELY, NV 89301

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WHITE PINE COUNTY LIBRARY
950 CAMPTON ST
ELY, NV 89301

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ELY, NV 89301

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LOVELOCK, NV 89419-0878

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ENGLEWOOD, CO 80111

MR BOB EDWARDS
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WINNEMUCCA, NV 89446

EUREKA COUNTY NATURAL RESOURCES DEPT
PO BOX 682
EUREKA, NV 89316

MR RANDY BUFFINGTON
BALD MOUNTAIN MINE
PO BOX 2706
ELKO, NV 89801

MARK FARMAN
EDAW
2022 J STREET
SACRAMENTO, CA 95814-3120

MR LAWRENCE ASTOR
INTERTRIBAL COUNCIL OF NEVADA
PO BOX 7440
RENO, NV 89510

MR IAN CAMPBELL
WASHOE COUNTY LIBRARY
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RENO, NV 89505-2151

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NEVADA MINING ASSOC
9210 PROTOTYPE DRIVE
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RENO, NV 89511

KATIE FITE
WESTERN WATERSHEDS PROJECT
PO BOX 2863
BOISE, ID 83701-2863

MR STEVE FOREE
NEV DIV OF WILDLIFE
60 YOUTH CENTER RD
ELKO, NV 89801-9501

PROFESSOR H PAUL FRIESEMA
ENVIRONMENTAL POLICY PROGRAM IPR
NORTHWESTERN UNIVERSITY
2040 SHERIDAN ROAD
EVANSTON, IL 60208-4100

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PROFESSOR
UNR MS 202
RENO, NV 89557

MS CANDICE GRAYMAN
MOAPA TRIBAL BUSINESS COUNCIL
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MOAPA, NV 89025

SANDRA GREEN
EUREKA COUNTY COMMISSIONER
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EUREKA, NV 89316-0614

MS MARY LOU GRIFFIN
5 JV WALKER ST
ELY, NV 89301

KIM HANSON
RUBY LAKE NWR
HC 60 BOX 860
RUBY VALLEY, NV 89833-9802

MR JOHN E HIATT
MOSO RAC
8180 PLACID ST
LAS VEGAS, NV 89123

GREG AND DEB HOLDER
SEED INVESTMENTS
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SPRINGFIELD, OR 97447

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US FOREST SERVICE HUMBOLDT NATL FOREST
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ELY, NV 89301

MICHAEL LEWIS
PO BIX 474
RUTH, NV 89319

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ENVIRONMENTAL SCIENCE ASSOCIATES
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LOS ANGELES, CA 90017

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ELY SHOSHONE TRIBE
400 NEWE VIEW
ELY, NV 89301

MS LAUREL MARSHALL
EUREKA PRODUCERS COOPERATIVE
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EUREKA, NV 89316

MS BARBARA L MATHEWS
CHURCHILL COUNTY LIBRARY
553 S MAINE STREET
FALLON, NV 89406

MR SHIRLEY MCCROSKY
AURA RESOURCES
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BOX 172
PIOCHE, NV 89043

MR DAVID MCCULLOUGH
MCCULLOUGH ECOLOGICAL SYSTEMS
1018 WHITEHOLLOW AVE
NO LAS VEGAS, NV 89031

MR ARLAN MELENDEZ
RENOSPARKS INDIAN COLONY
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RENO, NV 89520

JERRY AND MARY MILLETT
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PO BOX 140068
DUCKWATER, NV 89314

DAVID AND ROBERTA L MOORE
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PO BOX 91
BAKER, NV 89311

JON L MULLER
WHITE PINE COUNTY
953 CAMPTON ST COURTHOUSE ANNEX
ELY, NV 89301

MR TOM MYERS
FRIENDS OF NEVADA WILDERNESS
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RENO, NV 89512

MR ROBERT E OSTLUND
OSCEOLA PLACER MINE
OSCEOLA BAKER STAGE
HC 64 BOX 64570
ELY, NV 89301

MRS LORI ROMERO
WHITE PINE COUNTY LIBRARY
950 CAMPTON ST
ELY, NV 89301

MR W RUSSEL
HC 34 BOX 34050
ELY, NV 89301

JUNE SHAPUTIS
WHITE PINE HISTORICAL SOCIETY
PO BOX 552
RUTH, NV 89319-0552

TERI SLATAUSKI
NEVADA DEPARTMENT OF WILDLIFE
P O BOX 1032
TONOPAH, NV 89049

MR DAVID K STEED
EIS ENVIRONMENTAL CONSULTING
31 N MAIN
HELPER, UT 84526

MS CHRISTINE STONES
ELY SHOSHONE TRIBE
16 SHOSHONE CIRCLE
ELY, NV 89301

The formal public scoping process concludes at 5 p.m., Friday, May 25, 2007. Interested individuals should address all written comments to the BLM Ely Field Office, HC 33 Box 33500, Ely, Nev., 89301.

For more information, contact Project Manager Lynn Bjorklund, at (775) 289-1893 or at Lynn_Bjorklund@nv.blm.gov.

- BLM -

SHIRLEY SUMMERS
TIMBISHA SHOSHONE TRIBAL OFFICE
PO BOX 786
BISHOP, CA 93515

MR DAVE TILFORD
DESERT MOUNTAIN REALTY INC
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ELY, NV 89301

CODY TINGEY
CATHEDRAL GORGE STATE PARK
PO BOX 176
PANACA, NV 89042

DENNIS W TIPPETS
MINEX RESOURCES INC
1614 GANNETT DR
RIVERTON, WY 82501

MR DALE TROTT
BURNS MCDONNELL
PO BOX 419173
PO BOX 173
KANSAS CITY, MO 64141-6173

MR THOMAS M TWEDT
BIOWEST INC
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LOGAN, UT 84321

TIM VOGT
9033 SANDY SHORES DRIVE
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MR DON WAGENET
CO NAVIGANT CONSULTING INC
3100 ZINFANDEL DR
SUITE 600
RANCHO CORDOVA, CA 95670-6026

MR STEVE WEAVER
NEVADA DIVISION STATE PARKS
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PANACA, NV 89042

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KENS FIREWOOD
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LAS VEGAS, NV 89115

MR NORMAN WILDER
FT INDEPENDENCE PAIUTE COMM COUN
PO BOX 67
INDEPENDENCE, CA 93526

MR ROBERT WILSON
WHITE PINE CO NV COOP EXTENSION
995 CAMPTON STREET
ELY, NV 89301

MR DON L ZERGA
D L ZERGA ASSOCIATES
PO BOX 301
CRYSTAL BAY, NV 89402

LYNN ZONGE
RESOURCE CONCEPTS, INC.
340 NO MINNESOTA STREET
CARSON CITY, NV 89703-4152

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Ely District Office
HC33 Box 33500 (702 N. Industrial Way)
Ely, Nevada 89301-9408
http://www.blm.gov/nv/st/en/fo/ely_field_office.html

TAKE PRIDE® IN AMERICA

In Reply Refer to:
380910 NV040
N82888

DEC 08 2008

Dear Interested Public:

Please find enclosed one copy of the Bald Mountain Mine North Operations Area Project Draft Environmental Impact Statement (DEIS), dated November 2008. This document has been prepared by the Bureau of Land Management, Ely Field Office and is provided for the public's review and comment.

The Proposed Action would result in combining the Bald Mountain Mine and Mooney Basin Plan of Operations boundaries to become the North Operations Area Project. The Proposed Action would result in an increase of disturbances from 4,160 acres to 8,080 acres. Existing facilities, including pits, rock disposal areas, heap leach pads, processing facilities, and interpit areas are proposed to be expanded. New facilities under the Proposed Action would include one new pit, four new rock disposal areas, haul roads, topsoil stockpiles, and a remote truck shop facility.

Alternatives that were analyzed in this DEIS include the Proposed Action, No Action Alternative, Backfill Alternative, and the Mooney Basin Heap Leach Pad Alternative. While an agency preferred alternative has been identified in this Draft, a final decision has not been made. The final decision, which will be documented in a Record of Decision, will be made only after consideration of the comments received on the Draft and after a Final EIS has been released.

Your review and comments are needed to ensure that your concerns are adequately addressed. All comments will be fully considered and evaluated in the preparation of the Final EIS, and all substantive comments will be addressed. Comments should be as specific as possible and address the adequacy and accuracy of the document.

The public scoping period for this project began on December 19, 2008, with the publication of the Notice of Availability in the Federal Register. Comments on the DEIS will be accepted for 45 days, until the close of business February 2, 2009. Written comments or questions may be directed to Lynn Bjorklund, Project Lead, at the BLM, Ely District Office, HC 33 Box 33500 (705 No. Industrial Way), Ely, Nevada 89301-9408. You may also email comments to: Lynn_Bjorklund@blm.gov.

Public meetings are scheduled for January 6, 7, and 8 in Ely, Elko, and Eureka respectively. Additional information on these public meeting times and locations will be released at least 15 days in advance.

Comments, including name and street addresses of respondents, will be available for public review at the Ely District Office during the regular business hours of 7:30 a.m. through 4:30 p.m., Monday through Friday, except holidays, and may be published as part of the Final EIS. You may request confidentiality if you are commenting as an individual, but you must state this prominently at the beginning of your written comments. Such requests will be honored to the extent allowed by law. Anonymous or illegible comments will not be considered. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be available for public inspection in their entirety.

The Plan of Operations, copies of the DEIS, and applicable technical reports are available for review at the BLM Ely District Office. If you have additional questions you can call Lynn Bjorklund at 775 289-1893.

Sincerely,

John F. Ruhs
District Manager
Ely District Office
NV040

[Federal Register: December 19, 2008 (Volume 73, Number 245)]
[Notices]
[Page 77831]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr19de08-160]

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[NV-040-07-5110-CF05; N-82888; 8-08807; TAS: 14X5017]

Notice of Availability of the Draft Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project in White Pine County, Nevada

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice of availability.

SUMMARY: In accordance with section 102(2)(c) of the National Environmental Policy Act of 1969 and 43 CFR 3809, the Bureau of Land Management (BLM) Ely District, Nevada has prepared a Draft Environmental Impact Statement (EIS) for a proposed expansion of the existing Plans of Operation for Barrick Gold U.S. Inc.'s Bald Mountain Mine and Mooney Basin Mine located in White Pine County, Nevada. The two existing mines would be combined into one new expanded operation which would be called the North Operations Area. The Draft EIS analyzes the environmental effects of the Proposed Action, two action alternatives, and the No Action Alternative.

DATES: Comments on the Draft EIS will be accepted for 45 days after the date this Notice of Availability (NOA) is published in the Federal Register. BLM will host public meetings in Ely, Elko, and Eureka, Nevada, to provide the public with an opportunity to review the proposal and project information. Federal, state, and local agencies, and other individuals or organizations that may be interested in, or affected by, the BLM's decision on this proposed Plan of Operation are invited to participate in these public meetings. The BLM will notify the public of the meeting dates, times, and locations at least 15 days prior to the meetings. Announcements of the public meeting will be made by news release to the media, individual letter mailings, and posting on the BLM Web site: http://www.blm.gov/nv/st/en/fo/ely_field_office.html. Comments received on the Draft EIS will be considered in preparing the Final EIS. Documents pertinent to this proposal may be examined at the Ely District Office.

ADDRESSES: Comments may be submitted by any of the following methods:
E-mail: lynn_bjorklund@nv.blm.gov
Fax: 775-189-1910
Mail: Bureau of Land Management, Ely District, Attention: Lynn Bjorklund, HC33 Box 33500, Ely, Nevada, 89301

FOR FURTHER INFORMATION: For further information and/or to have your name added to the mailing list, contact Lynn Bjorklund, Ely Field

Office, at 775 289-1893 or by email to lynn_bjorklund@nv.blm.gov.

SUPPLEMENTARY INFORMATION: Barrick Gold U.S. Inc. has submitted a proposal to expand and combine their existing Bald Mountain and Mooney Basin Mines into one project area to be administered under one Plan of Operation called North Operations Area. The mines are located approximately 65 miles northwest of Ely, Nevada. This proposed expansion is entirely on unpatented mining claims on BLM-administered public land.

The Proposed North Operations Area would include 4,160 acres of previously permitted disturbance and 3,920 acres of new disturbance, for a total of 8,080 acres. The project would consist of extending existing open pits, expanding existing rock disposal areas and heap leach facilities, construction of a truck shop, additional exploration, concurrent reclamation and continuing operation of existing facilities.

Individual respondents may request confidentiality. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment, which includes your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so. All submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses will be available for public inspection in their entirety. The minutes and list of attendees for each public meeting will be available to the public and open for 60 days after the meeting to any participants who wish to clarify the views they expressed. All comments will be available to the public for review at the BLM Ely District Office throughout the EIS process.

Authority: 43 CFR 3809.

Michael J. Herder,
Acting District Manager, Ely District Office.
[FR Doc. E8-30079 Filed 12-18-08; 8:45 am]

BILLING CODE 4310-HC-P

White Pine County Library
950 Campton Street
Ely, NV 89301

Washoe County Library
P.O. Box 2151
Reno, NV 89502

Wells Branch Library
208 Baker Street
P.O. Box 691
Wells, NV 89835

Elko County Library
720 Court Street
Elko, NV 89801

Eureka Branch Library
10190 Monroe Street
P.O. Box 293
Eureka, NV 89316

Karen Rajala
Public Land Users Advisory Committee
White Pine County Economic Diversification Council
957 Campton
Ely, NV 89301

Mr. John Hadder
Great Basin Resource Watch
85 Keystone Avenue, Suite K
Reno, NV 89503

Mr. Todd Suessmith
Nevada Division of Environmental Protection
Bureau of Mining Regulation and Reclamation
901 South Stewart Street, Suite 4001
Carson City, NV 89701

Mr. Richard A. Orr
Sustainable Grazing Coalition
P.O. Box 145
Caliente, NV 89008

Nevada Department of Administration
Nevada State Clearinghouse
209 East Musser Street, Room 200
Carson City, NV 89701

Mr. Steven Tuttle
2044 East 725 South
Springville, UT 84663

Ms. Martha Collins
Refuge Manager
Ruby Lake National Wildlife Refuge
HC 60 Box 860
Ruby Valley, NV 89833

Mr. Tom Bath
Bath Lumber Co.
1800 Avenue G
Ely, NV 89301

Mr. Don Harris
Midway Gold Corp.
807 S. Thistle Drive
Spring Creek, NV 89815

Ms. Diane Rice
Wells Fargo
405 Idaho Street
Elko, NV 89801

Ms. Judy Overton
Eureka County
Department of Natural Resources
P.O. Box 682
Eureka, NV 89316

Mr. John Overton
Eureka County Natural Resource Advisory Commission
P.O. Box 682
Eureka, NV 89316

Mr. Jim Ithurralde
Eureka County Commissioners
P.O. Box 677
Eureka County, NV 89316

Mr. Matt Zietlow
Barrick Bald Mountain Mine
P.O. Box 2706
Elko, NV 89803

Bureau of Land Management
Ely District Office
HC 33 Box 33500

Ely, NV 89301

Bureau of Land Management
Battle Mountain District Office
50 Bastian Road
Battle Mountain, Nevada 89820

Bureau of Land Management
Elko District Office
3900 East Idaho Street
Elko, Nevada 89801

Mr. Brian Amme
Bureau of Land Management
Nevada State Office
1340 Financial Blvd.
Reno, NV 89502

Ms. Katie Miller
Nevada Department of Wildlife
60 Youth Center Road
Elko, NV 89801

Mr. Terry Svalberg
Bridger-Teton National Forest
Pinedale Ranger District
29 East Fremont Lake Road
Pinedale, WY 82941

Ms. Barbara Ott
USFS Teams
8337 Braun Court
Arvada, CO 80005-5815

Ms. Sue Howle
USFS Teams
20 High Street
Greenville, SC 29605

Office of Environmental Policy and Compliance
Oakland Region
Jackson Center One
1111 Jackson Street, Suite 520
Oakland, CA 94607

U.S. Environmental Protection Agency
Office of Federal Activities
EIS Filing Section, Room 7220
Mail Code 2252-A

Ariel Rios Bldg, (South Oval Lobby)
1200 Pennsylvania Avenue, NW
Washington, D.C. 20004

Ms. Gwen Wilder
U.S. Department of the Interior
Office of Environmental Policy & Compliance
1849 C Street, NW (Mail Stop 2342 MIB)
Washington, D.C. 20240

U.S. Department of the Interior
Natural Resources Library
1849 C Street NW
Washington, D.C. 20240

U.S. Department of the Interior
Office of NEPA
1000 Independence Ave. SW Mail Code Eh-42, Room 3E094
Washington, D.C. 20585

Bureau of Land Management
Planning Office
Mail Stop 850 LS
1849 C Street NW
Washington, D.C. 20240

National Operations Center
Division of Resource Services
P.O. Box 25047
Bldg 50
Denver Federal Center
Denver, CO 80225-0047

Bureau of Reclamation
Denver Federal Center
P.O. Box 25007
Denver, CO 80225-0007

Assistant Director, Endangered Species
U.S. Department of the Interior
Fish and Wildlife Service
1849 C Street NW
Washington, D.C. 20240

Chief, Environment Operations and Analysis Branch
U.S. Department of the Interior
Minerals Management Service
381 Eldon Street
Herndon, VA 20170-4817

Division of Environmental Compliance (762)
National Park Service
Department of the Interior
Washington, D.C. 20240

Environmental Affairs Program
U.S. Geological Survey
National Center (423)
Department of the Interior
Reston, VI 22092

Office of Deputy A/S of the USAF
Environment, Safety, Occupational Health
SAF/RQ Room 4C916, Pentagon
Washington, D.C. 20330-0001

Chief, Planning Division
South Pacific Division
Army Corps of Engineers
1455 Market Street
San Francisco, CA 94103

Office of Environmental Compliance (EH-23)
1000 Independence Avenue, SW
Department of Energy
Washington, D.C. 20585

U.S. Department of the Interior
Office of External and Intergovernmental Affairs
1849 C Street NW
Washington, D.C. 20240

Advisory Council on Historic Preservation
Director, Plan
75 Hawtning & Review
1100 Pennsylvania Avenue, NW
Suite 809
Washington, D.C. 20004

Ms. Jeanne Geselbracht
Environmental Protection Agency
Region 9horne Street
San Francisco, CA 94105

State Historic Preservation Office
100 N Stewart Street
Carson City, NV 89701-4285

U.S. Fish and Wildlife Service

Nevada Office Director
1340 Financial Blvd
Reno, NV 89502

U.S. Department of the Interior
Bureau of Land Management
Washington Office
Mail Stop 1075, 1620 L Street, NW
Attn: *Nevada Liaison Room 850*
Washington, DC 20036

Mr. David Gonzales, Chair
Te-Moak Tribe of the Western
Shoshone Indians of Nevada
525 Sunset Street
Elko, NV 89801

Renae Pete, Chair
Cedar City Band of Paiutes
600 North 100 East
Cedar City, UT 84702

Mr. Rupert Steele, Chair
Confederate Tribes of the
Goshute Indian Reservation
P.O. Box 6104
Ibapah, UT 84034-1138

Ms. Jeannine Borchardth, Chair
Indian Peaks Band
440 North Paiute Drive
Cedar City, UT 84034-1138

Mr. Jerry Millet, Chair
Duckwater Shoshone Tribe
P.O. Box 140068
Duckwater, NV 89314-0068

Mr. Glenn Rogers, Chair
Shivwits Band of Paiutes
6060 West 3650 North
Ivins, UT 84738-6818
Philbert Swain, Chair
Moapa Band of Paiutes
P.O. Box 340
Moapa, NV 89025-0340

Ms. Diana Buckner, Chair
Ely Shoshone Tribe
16 Shoshone Circle
Ely, NV 89301

Mr. Alfreda Mitre, Chair
Las Vegas Paiute Tribe
One Paiute Drive
Las Vegas, NV 89106

Ona Sequndo, Chair
Kaibab Band of Paiute Indians
HC 65 Box 2
Fredonia, AZ 86022

Ms. Lora Tom, Chair
Paiute Indian Tribe of Utah
44 North Paiute Drive
Cedar City, UT 84720

APPENDIX C

DEIS Public Comments and Responses

In the response to comments, every effort was made to address all points that were brought up by the person or group submitting the letter. Some comments are considered "non-substantive" as defined in the BLM NEPA Handbook and are not conducive to a response because they are:

- Comments in favor of or against the Proposed Action or alternatives that do not provide a reasonable basis to question the accuracy, adequacy, methodology, or assumptions within the EIS; present new information relative to the analysis; present new and reasonable alternatives; or cause changes or revisions to the EIS analysis, Proposed Action or alternatives;

- Comments that only agree or disagree with BLM policy or resource decisions without justification or supporting data that meet the criteria listed above (such as "more grazing should be permitted");

- Comments that do not pertain to the project area or the project (such as "the government should eliminate all dams," when the project is about a grazing permit); and

- Comments that take the form of vague, open-ended questions.

In cases such as the above, the BLM response will be "statement noted" indicating the letter or point was acknowledged, but no specific response was warranted.

A

STATE OF NEVADA

DEPARTMENT OF WILDLIFE

1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

JIM GIBBONS
Governor

KENNETH E. MAYER
Director

DOUG HUNT
Deputy Director

January 5, 2009

Lynn Bjorklund
BLM – Ely District Office
HC33 Box 33500
Ely, NV 89301-9408

RE: Bald Mountain Mine North Operations Area Project DEIS

Dear Ms. Bjorklund,

Thank you for the opportunity to read and review Barrick's proposed Bald Mountain Mine North Operations Area Project. The Nevada Department of Wildlife has enjoyed working with Barrick and the BLM to address issues through the NEPA process and the development of this document.

A-1 The Nevada Department of Wildlife would like to take this opportunity to endorse the Partial Backfill Alternative, as described in section 2.5.2 of the DEIS. The Partial Backfill Alternative maximizes the post-mining habitat for wildlife use. Large open pits left on the landscape not only reduce the quantity of habitat present for wildlife post-mining, but can pose as obstacles in terrestrial wildlife migration. Mule deer have been documented to use the proposed action area as transitional habitat between summer and wintering ranges. The Partial Backfill Alternative will increase the amount of transitional habitat present, as opposed to the Proposed Action, after mining ceases in the project area. As such, this alternative will minimize the long term impacts to Nevada's wildlife.

If you have any questions about my comments, please contact me.

Sincerely,

KMiller

Katie Erin G. Miller
Eastern Region Mining Biologist
Nevada Department of Wildlife
60 Youth Center Road
Elko, NV 89801
775-777-2368
kmiller@ndow.org

Response No. A-1: *Statement noted.*

B

Bald Mountain Mine North Operations Area Project
Draft Environmental Impact Statement

Draft EIS Public Meeting Comment Form

Informed decisions are better decisions: The Bureau of Land Management (BLM) believes that extensive public involvement will serve to improve communication, develop enhanced understanding of different perspectives, and identify solutions to issues and problems. We look forward to hearing from you.

Where to provide comments: You can hand this form in at a public scoping meeting or mail it using the address on reverse. ***Comments can also be provided via email to: Lynn_Bjorklund@blm.gov.***

Bureau of Land Management
JAN 12 2009
RECEIVED

Name PATRICK ROGERS County ELKO

Title ______ Organization ______

Mailing Address 408 FIR STREET

City ELKO State NV Zip 89801

Email ______

Date 08 JAN 2009 Meeting Location (if applicable) ELKO

☑ Please check box if you do **not** want your name released when comments are made public.

☑ Please check box if you want to receive a hard copy of the Final Environmental Impact Statement and Record of Decision.

COMMENT *(use back side if you need additional space or attach additional sheets)*

-1 I strongly support the Bald Mountain Mines North Operations Area Project and encourage the BLM to quickly move to an FEIS and Favorable R.O.D. The DEIS is comprehensive and well-written. The design features and SOPs effectively minimize potential environmental impacts. The project will create much-needed economic growth and stability. Barrick has a proven record of responsible, environmentally-protective operations and is a strong supporter of the communities in which they operate.

To Return via US Mail: Fold in thirds so BLM address (on reverse) is showing, add postage, tape bottom of fold, and mail. ***Please have comments postmarked by February 2, 2009.***

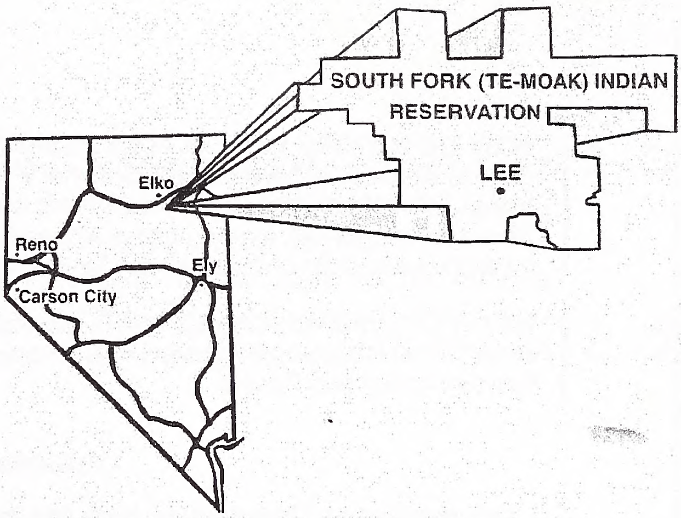
To provide comments via email: Please email comments to: Lynn_Bjorklund@blm.gov ***by February 2, 2009.***

Response No. B-1: *Statements noted.*

C

SOUTH FORK BAND COUNCIL
SOUTH FORK INDIAN RESERVATION
21 LEE, B-13
SPRING CREEK, NEVADA 89815

775-744-4273 FAX 775-744-4523



RESOLUTION OF THE GOVERNING BODY OF THE SOUTH FORK BAND INDIAN RESERVATION

Resolution No. 07-SF-19

BE IT RESOLVED BY THE SOUTH FORK BAND COUNCIL:

WHEREAS, this is a constituent Band of the Te-Moak Tribe, known as the South Fork Band Council, as defined by the Indian Reorganization Act of June 18, 1934, as amended and operates and functions in accordance with the Constitution of Te-Moak Tribe of Western Shoshone Indians of Nevada, and

WHEREAS, the South Fork Band Council is the governing body of the South Fork Indian Reservation, and is empowered by the Constitution to promote and protect the welfare of its members, and to enact all ordinances and resolutions which shall be necessary and proper for carrying into effect the foregoing powers, and

WHEREAS, mining that is in operation by Barrick Mining Company has escalated out of proportion to affect the lands by polluting the waters, fish, and changing the migration paths and routes of all animals that have been here for thousands of years, and

WHEREAS, the mines that Barrick has operating and are planning to open are the
Cortez Hills, Pipeline Project, Horse Canyon, Bal Mountain, Beteiz Mine, and other
mines that are not made public as of yet. These mines will affect all people, sportsmen,
grazers, water tables, springs, Shoshone gathering areas for pine nuts, medicine plants,
C-1 sacred areas, burial areas, animals, birds, and all things that have a purpose in the
circle of life, and

WHEREAS, the Shoshone People have not agreed to the vast devastation of lands and cultural areas that have been removed by the mining of gold, and

WHEREAS, the expansion of Bald Mountain will have an ever lasting impact to the Odgers Ranch area in ways that hurt the members that are trying to make a living for their families and the South Fork Reservation. The members of the Odgers Reservation will lose water, grazing areas, pine nut areas, gathering areas, and many traditional values.

C-2 **NOW THEREFORE BE IT RESOLVED** that Barrick Mining cease in being partners with BLM in destroying Nevada and Shoshone ancestral lands under the Treaty of Ruby Valley. The South Fork Band Council opposes any and all mining expansions until the Supreme law of the land is respected and Barrick be more involved in following its guidelines and policy on indigenous lands and its people.

C-3 **BE IT FURTHER RESOLVED THAT,** the South Fork Band Council encourages the Te-Moak Tribal Council to become more involved in these mining issues on behalf of the Western Shoshone People.

- CERTIFICATION -

I, the undersigned as Chairman of the South Fork Band Council do hereby certify that the South Fork Band Council is composed of seven (7) members, of whom 6 constituting a quorum were present at a Special Meeting duly held on the 26th day of June 2007, and that the forgoing resolution was duly adopted at such meeting by a vote of **6 for, 0 against, and 0 abstentions,** pursuant to Article 4, Section 12 (a) and (b) and Section 13 of the Constitution of the Te-Moak Tribe of Western Shoshone Indians of Nevada.

Cheryl Mose-Temoke, Chairman
South Fork Band Council

Attest:

Kristine Preston, Acting Recording Secretary

Response No. C-1: *All resources identified in the South Fork Band Resolution No. 07-SF-19 (such as grazing-Section 3.10, water resources-Section 3.2, pine nut areas-Section 3.12, etc.) have been identified and addressed in the FEIS. Environmental Justice is discussed in Section 3.18.1 and Section 3.18.2 and identifies the Proposed Action is not expected to have a disproportionate effect on any particular population. Section 3.20 indicates no traditional cultural properties have been identified within the Proposed Action area that might be impacted by the Proposed Action or any of the alternatives.*

Response No. C-2: *Statements noted.*

Response No. C-3: *BLM will continue ongoing consultation with Native American Tribes and governmental representatives in accordance with* the American Indian Religious Freedom Act of 1978, Executive Order 13007, *Indian Sacred Sites*, and *Section 106 of the National Historic Preservation Act.*

D

Lynn Bjorklund
Environmental Protection Specialist/Minerals Egan Field Office, Ely District Bureau of Land Management
775 289-1893
----- Forwarded by Lynn Bjorklund/EYFO/NV/BLM/DOI on 02/02/2009 04:16 PM -----

Emiliano McLane <bosquedo@yahoo.com>	To: lynn_bjorklund@nv.blm.gov
02/02/2009 04:09 PM	cc
	Subject: Bald Mountain DEIS comment

To whom this may concern,

D-1 On behalf of the South Fork Band Environmental Department, we would like to oppose any expansion of the said mine as it will harm even more of the surrounding environment. Until false studies have been eleminated from your reports and comments are actually looked at and considered, our department will continue to oppose the Bald Mountain Mine North Operations Area Project in White Pine County, Nevada. Also, I have attached a resolution from the South Fork Band Tribal Council opposing the project. Thank you for your consideration,

Emiliano McLane, Coordinator
South Fork Band Environmental
21 Lee B-13
Spring Creek, NV 89815
Phone: 775-744-2387

(See attached file: Microsoft_Word_-_south_fork_resolution[1].pdf)

Response No. D-1: *The South Fork Band Council Resolution 07-SF-19 that was attached to this letter is addressed in Responses C-1 through C-3. All substantive comments have been considered and responded to in this Final Environmental Impact Statement.*

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Reston, VA 20192

In Reply Refer To:
Mail Stop 423

January 29, 2009

Ms. Lynn Bjorklund, Project Lead
Bureau of Land Management
Ely District Office
HC 33 Box 33500
705 No. Industrial Way
Ely, Nevada 89301-9408

Subject: Draft Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project

Dear Ms. Bjorklund:

As requested by your correspondence of December 8, 2008, the U.S. Geological Survey (USGS) has reviewed the subject draft environmental impact statement (DEIS) and offers the following comment.

SPECIFIC COMMENT

Section 3.2.3 Groundwater Affected Environment, page 3-27, first paragraph, last 2 sentences; and Section 6.1 References, page 6-15

E-1 The USGS publication (2007) is no longer current due to changes in the water budget calculations. It has been superseded by the more recent publication, Welch and others (2008). The results presented in the more recent report should be incorporated into analyses presented in the final EIS.

REFERENCE

Welch, A. H.; Bright, D.J.; and Knochenmus, L. A., eds, 2008, Water Resources of the Basin and Range Carbonate-Rock Aquifer System, White Pine County, Nevada, and Adjacent Areas in Nevada and Utah, U.S. Geological Survey Scientific Investigations Report 2007–5261, 97 p. available on the Internet at http://pubs.usgs.gov/sir/2007/5261/

Thank you for the opportunity to review and comment on the DEIS. If you have any questions concerning our comment, please contact Lloyd Woosley, Chief of the USGS Environmental Affairs Program, at (703) 350-8797 or at lwoosley@usgs.gov.

Sincerely,

/Signed/

James F. Devine
Senior Advisor for Science Applications

***Response No. E-1:** This reference information has been changed in the FEIS, as suggested except for the date. The date was kept as 2007 as this is the preferred reference listed in the publication. The information in the new publication was reviewed. As it did not present information that changed the evaluation or conclusion of this document, no further changes were deemed necessary.*

F

"Steve Tuttle "
<stuttle@klune.com>
01/06/2009 09:52 AM

To <Lynn_Bjorklund@nv.blm.gov>
cc
bcc
Subject DEIS Objection to Expansion

History: This message has been forwarded.

To: Lynn Bjorklund
Project Lead
BLM

In Reference to:
DEIS
380910 NV040
N82888
Jan. 6, 2009

General Comments:

Dear Lynn,

1 I am a property owner of forty acres of private patented property bordering the proposed mining plan for the Bald Mountain Mine North Operation Area Project.

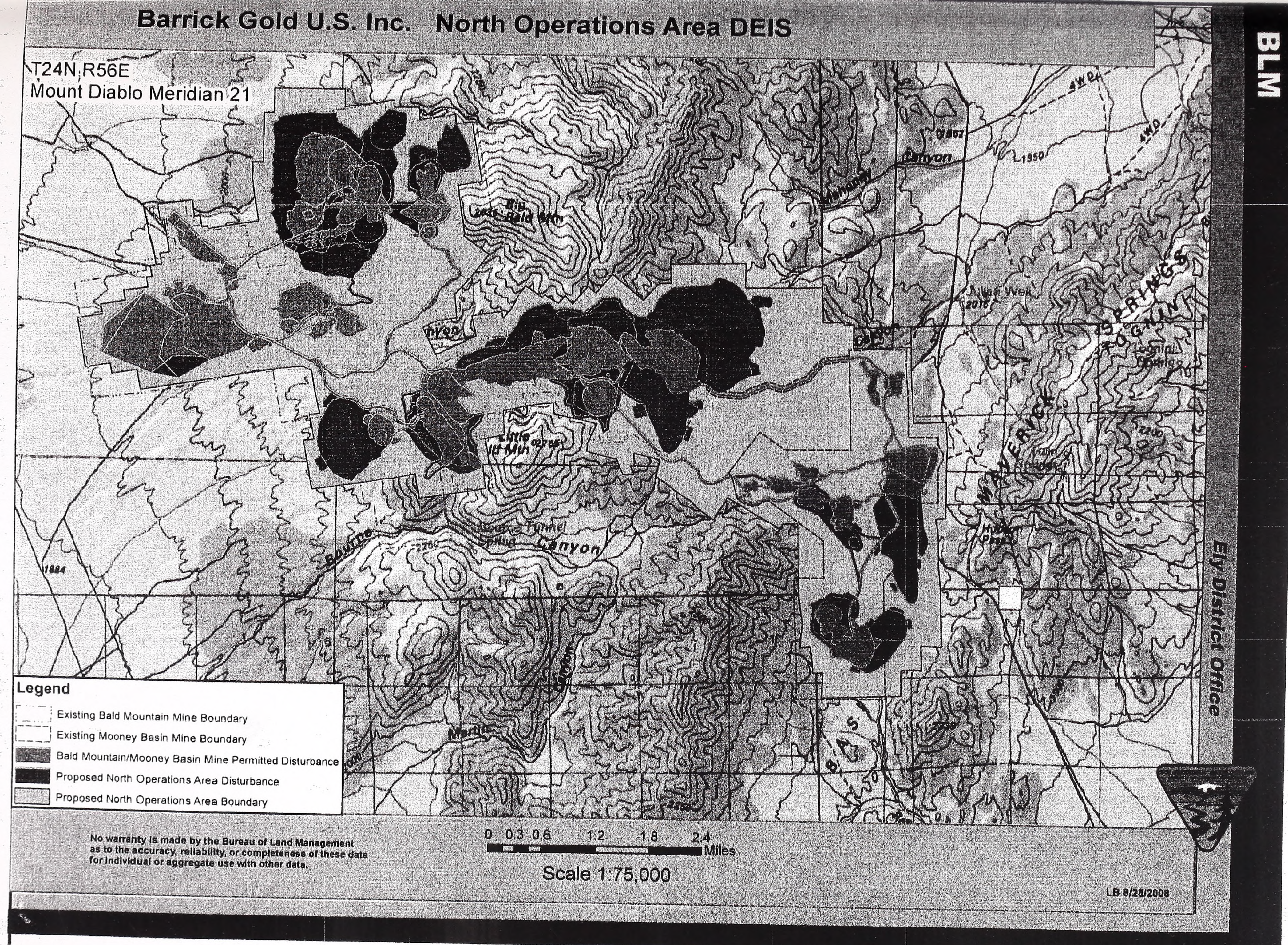
The location description of my property is the NE ¼ NE ¼ Sec. 5, Township 23, Range 58 Lot #1. I purchased the property in 1981 and my plans were, and still are, to develop the property into recreational building lots. My concern is that this Environmental Impact Statement Proposal has ignored the proximity of my property to the mining activity and does not address the impact the mine activity will have on my property. The current proposal will bring the Mooney Leach Pad, Saga RDA and the Saga Pit a few thousand feet from my property.

Barrick Gold is well aware of the proximity of my property and my plans for the recreational development. Placer Dome (Barrick Gold), placed mining claims on my property on June 4, 2005, and have, until recently, been active in purchasing the surface and mineral rights, but to date no agreements for sale have been made. Therefore; to protect my interests and guarantee the greatest return on my investment from my property, I must take exception, and object to the Expansion Proposal of the Bald Mountain Mine North Operations Area Project for the environmental impacts the mining will place on my property.

-2 I hope my property concerns are addressed within any final draft of the DEIS and that all my property rights for clean air, adequate clean water, land access, and visual impact are addressed and that I am protected. I will be e-mailing you specific comments and questions before the Feb. 2, 2009 deadline of the scoping period.

Thank

You,


Barrick Gold U.S. Inc. North Operations Area DEIS
T24N R56E
Mount Diablo Meridian 21
BLM
Ely District Office
Big Bald Mtn
Little Bald Mtn
Canyon
Mahoney
Julian Well
Bourne
Canyon
Martin
Legend
Existing Bald Mountain Mine Boundary
Existing Mooney Basin Mine Boundary
Bald Mountain/Mooney Basin Mine Permitted Disturbance
Proposed North Operations Area Disturbance
Proposed North Operations Area Boundary
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.
0 0.3 0.6 1.2 1.8 2.4 Miles
Scale 1:75,000
LB 8/28/2008

Response No. F-1: *Potential impacts of the Proposed Action on surrounding areas have been analyzed in Section 3 of the FEIS. The property in question was analyzed in its current undeveloped state. On March 2, 2009, JBR spoke with Mr. Bob Bishop, White Pine County Assessor's office. According to the Assessor's office, no plans for development have been submitted to White Pine County for consideration for this property. It is also noted the property identified in the letter does not border the North Operations Project plan of operations border, but is approximately 3,300 feet (0.63 mile) from the Plan of Operations border. Implementation of the proposed project will result in the Saga Rock Disposal Area being 5,100 feet (0.97 mile) from the subject parcel; Saga Pit being 8,000 feet (1.52 miles) from the subject parcel; and the Mooney Heap Leach Pad being 4,800 feet (0.91 mile) from the subject parcel.*

Response No. F-2: *The text of the FEIS has been revised to address these issues and they have been addressed throughout Chapter 3 of the FEIS.*

G

Lynn Bjorklund
Environmental Protection Specialist/Minerals Egan Field Office, Ely District Bureau of Land Management
775 289-1893
----- Forwarded by Lynn Bjorklund/EYFO/NV/BLM/DOI on 01/28/2009 09:19 AM -----

"Steve Tuttle" <stuttle@klune.com>	To	<Lynn Bjorklund@nv.blm.gov>
01/28/2009 09:18 AM	cc	
	Subject	Specific Comments on DEIS Bald Mountain

In my opposition to this expansion, these are specific issues and questions I have with this draft of the DEIS Bald Mountain Mine North Operation Area Project.
To: Lynn Bjorklund
Project Lead
BLM

In Reference to:
DEIS
380910 NV040
N82888

Jan. 28, 2009

Dear Lynn,

G-1 I am a property owner of forty acres of private patented property bordering the proposed mining plan for the Bald Mountain Mine North Operation Area Project.

The location description of my property is the NE ¼ NE ¼ Sec. 5, Township 23, Range 58, Lot #1. I purchased the property in 1981 and my plans were, and still are, to develop the property into recreational building lots. My concern is that this Environmental Impact Statement Proposal has ignored the proximity of my property to the mining activity and does not address the impact the mine activity will have on my property. The current proposal will bring the Mooney Leach Pad, Saga RDA and the Saga Pit a few thousand feet from my property as I mentioned in my General Comments e-mail dated January 6, 2009.

Specific Comments and Questions in opposition to the proposed DEIS for the Bald Mountain Mine

S-10 Air Quality page S-10

G-2 My property is the closest sensitive receptor to this proposed action. Long Valley road intersects the tip of my property which is less than 1/2 mile east of the proposed expansion of the Mooney Basin leach pad. This section states the air quality will not be noticeable because the nearest residence is more than five fives from the purposed action area. This will not be true when I develop. How will my air quality be protected?

G-3 S-11 Noise and Vibration

This section states the noise profile would be expected to be unnoticeable or minor with the closest human residence over five miles away. This will not be true when I develop my property. How will the residences be protected?

G-4 Figure 2-6 Mooney Basin Operational Detail This map shows the purposed expansion of the Mooney Leach Pad getting very near to my property. Section Visual Resource S-10 shows the four key observation points. I believe my property should be added as an observation point to assure that a leach pad at 7195 ft crest elevation will not be seen from my property at 6800 ft altitude, or the Saga RDA stockpile at 7,000 crest elevation being seen from my property. Are reclamation efforts going to remove the leach pad and the Saga RDA after mining is complete?

Page 3-4 Section 3.2.1 Surface Water Affected Environment.

G-5 It should be noted that Willow Springs is a source of good drinking water year round, and less than ½ mile from my property. I have used this spring for twenty eight years and hope to continue to have access.

Water resource page S-3 Drinking Water:

G-6 Will Willow Spring be protected?

Groundwater page S-3

G-7 It should be noted of my plans for development and water usage needs, and be determined if my water demand for my development will be impacted.

Land Use and Access page S-9

G-8 This section states public access would be restricted in areas of active mining and processing for the life of the mine. Myself, and any private landowners in my development will need public access at all times to their property.

Waste Management 2-40

G-9 Will the proximity of the landfill site to my property, become a problem for contamination for my water supply for my development?

G-10 Ground Water Environmental Consequences 3.2.4 It is true no permitted generator users within five miles currently but if I obtain my development permit will I have enough clean and drinkable water?

G-11 Effects on Air Quality for Existing Emission Sources 3-116 This sections states the nearest residence or areas of human activity are ranches in the valleys below the purposed action and at least five miles distant from the mine boundary. My property is about ½ mile from the boundary. The mine site is about the same elevation as my property and therefore could increase the potential for concentration of pollutants on my property. How will the property be protected?

Regulatory Framework 3-117

G-12 Will my development be a Class 1 or Class 11 and will mining activity meet the standards with the proximity of my property to the mine boundary?

Air Source Emissions 3-123

G-13 This table shows expected emissions. Are these quantities allowable for residences where my property is located?

Access Road Corridors 3-124

G-14 My property is intersected by the Long Valley Road and I would be a sensitive receptor in the direct impact area.

Ambient Air Quality Impacts 3-125

G-15 Air quality modeling showed all predicted maximum impacts would occur on the Plan of operation boundary. My property is on the boundary and is not miles short of the nearest residence. How will my air quality be protected from these emissions?

Visual Resources Environmental Consequences 3.15.2

G-16 Should my property be classified as a visually sensitive land use so the quality of scenic resources would be protected with the Mooney leach pad, Saga RDA and possibly the Saga Pit so near? How will my views be protected during and after mining efforts are complete?

Table 3-14 Page3-102

G-17 Should my property be added to the table? NE ¼ NE ¼ Section 5 Township 23 N Range 58 E.

G-18 3.14.2 Air Quality Environmental Consequences If I am a Class I area, will the air pollutant concentrations not be exceeded in ambient air?

G-19 Mercury Emissions and other Chemicals listed Table 3-23 What will be done to control these emissions modeled on table 3-23 unto my property? Will my property be modeled?

Table 4-2

G-20 Should my property should be added to the table listing interactions between resources.

I have stated my opposition with issues and questions I have with this draft of the proposal as written, but offer issues might need to be addressed now that the BLM is aware of the proximity of my property to the mining operation and my plans for development of my property.

As I stated in my general comments on January 6,2009, I hope my property concerns are addressed within any final draft of the DEIS and that all my property rights for clean air, adequate clean water, land access, and visual impact are addressed and that I my property rights are protected.

Thank You,

Steven T. Tuttle
2044 East 725 South
Springville, Utah 84663

Response No. G-1: *See the response to comment F-1. It is noted the property identified in the letter does not border the North Operations Project Plan of Operations border, but is approximately 3,300 feet (0.63 mile) from the project Plan of Operations boundary.*

Response No. G-2: *A sensitive receptor has been more clearly defined in Section 3.14.1 Sensitive Receptors in the FEIS. The air quality analysis (Section 3.14 of the FEIS) documents that State and Federal ambient air quality standards would be met both at and beyond the project boundary. The average and maximum ambient impact of the Proposed Action would be comparable to those of the existing action, so there would be little to no net increase in impacts.*

Current and historic levels of traffic on the Long Valley Road by the referenced property result in a moderate amount of dust per vehicle passage, but very light average impacts because of the infrequent and intermittent traffic levels. The 15% increase in mine-bound traffic will slightly increase the frequency of vehicle passages, but will continue to result in minimal average impacts because traffic would remain light and intermittent. The slight increase in road traffic and associated dust does not change the overall assessments of impacts in the vicinity of the Tuttle property.

The use of the term sensitive receptor and its lack of applicability to an undeveloped and uninhabited parcel are documented in the response to comment G-14.

Response No. G-3: *Additional noise analysis has been added to Section 3.16.2 of the FEIS that addresses the noise level at this property.*

Response No. G-4: *Key Observation Points are selected to provide representative views of the Proposed Action because it is not feasible to discuss potential impacts from all possible viewing locations. When selecting Key Observation Points, emphasis is placed on locations from which the greatest number of people will view the project.*

A viewshed analysis of areas visible from the point of highest elevation on the Tuttle property shows that little of the existing and authorized disturbance (Saga Pit and Rock Disposal Area, Horseshoe Pit, and Belmont Pit 2) can be seen from the Tuttle property because of hills west of the property. Under the Proposed Action, virtually all of the Mooney Heap Leach Pad and Saga Rock Disposal Area expansion would be hidden from view (see Response to Comment Figures 1 and 2, which are attached to this response). Specifically, Figure 1 shows what is visible from the Tuttle property now (e.g., shows existing BMM facilities that are visible from the Tuttle property's highest point). Figure 2 shows what existing and proposed BMM facilities will be visible from the Tuttle property's highest point. The viewshed analysis is conservative because it does not account for the effect of pinyon-juniper forest on the hills between the Tuttle property and the Plan of Operations boundary that would tend to further obscure disturbed areas. Project impacts on the view from the Tuttle property are minor and no changes are required to the analysis of visual resource impacts presented in the DEIS.

As the FEIS states, the Mooney Heap Leach Pad and Saga Rock Disposal Area will not be removed but will be reclaimed by grading to final contours and restoring native vegetation.

Response No. G-5: *It is assumed the Willow Spring referred to in the letter is located in Section 32, Township 24 North, Range 58 East as shown on Figure 3-2 in the FEIS. This spring is more than one mile north of the Tuttle property. Both Willow springs shown on Figure 3-2 are* *located outside of the existing and proposed Plan of Operations boundary; and therefore access to both Willow springs would not be affected by the Proposed Action. Actual use of the spring is governed through water rights managed by the Nevada Division of Water Resources State Engineer. A search of the Nevada Division of Water Resources water rights database indicated Julian Goichechea holds the water rights to use Willow Spring for stock watering.*

Response No. G-6: *Willow Spring is discussed in Section 3.2.2 of the FEIS and the analysis shows spring flow and quality would not be affected by BMM because the recharge source is upgradient and from the east.*

Response No. G-7: *Potential project effects to surface water and groundwater, including all valid existing water rights, were analyzed in Section 3.2 of the FEIS. A review of the Nevada Division of Water Resources database does not indicate any water rights held under the name of Tuttle in this area, and any future development plans and associated water needs for this property will need review and approval from the Nevada Division of Water Resources State Engineer.*

Response No. G-8: *Public access would be restricted only to active mining areas within the Plan of Operations boundary. Access to other private property owners in the area, including the Tuttle property, would not be restricted by the Proposed Action.*

Response No. G-9: *Potential project effects to surface water and groundwater were analyzed in Section 3.2 of the FEIS. The proposed additional Class III Waivered landfill to be developed near the Mooney Basin Operations Area would be designed, permitted, constructed, and operated per standards regulated by Nevada Division of Environmental Protection to insure protection of Waters of the State. The Class III Waivered landfill accepts only inert industrial waste, preventing potential contamination of any water supply.*

Response No. G-10: *Potential project effects to surface water and groundwater were analyzed in Section 3.2 of the FEIS. Also see response to G-7 above.*

Response No. G-11: *The air quality analysis (Section 3.14 of the FEIS) documents applicable ambient air quality standards would be met everywhere at and beyond the project ambient air boundary. The average and maximum impacts of the Proposed Action would be comparable to those of the existing action, as there would be little to no net increase in emissions or impacts.*

Response No. G-12: *The Long Valley airshed is Class II. Compliance with applicable air quality standards is discussed in Response G-11.*

Response No. G-13: *Air quality standards are developed to protect public health and welfare. The response to G-11 documents that the applicable ambient air quality standards would be met at and beyond the project boundary.*

Response No. G-14: *Consistent with NEPA guidance and precedent and as described in Section 3.14.1 of the FEIS, properties or areas were considered sensitive receptors in the FEIS only if impacts to those sites could affect existing (or formally and definitively planned) populations or ecological areas especially sensitive to those impacts. That definition eliminates the undeveloped Tuttle property as a sensitive receptor.*

Response No. G-15: *See response to G-11.*

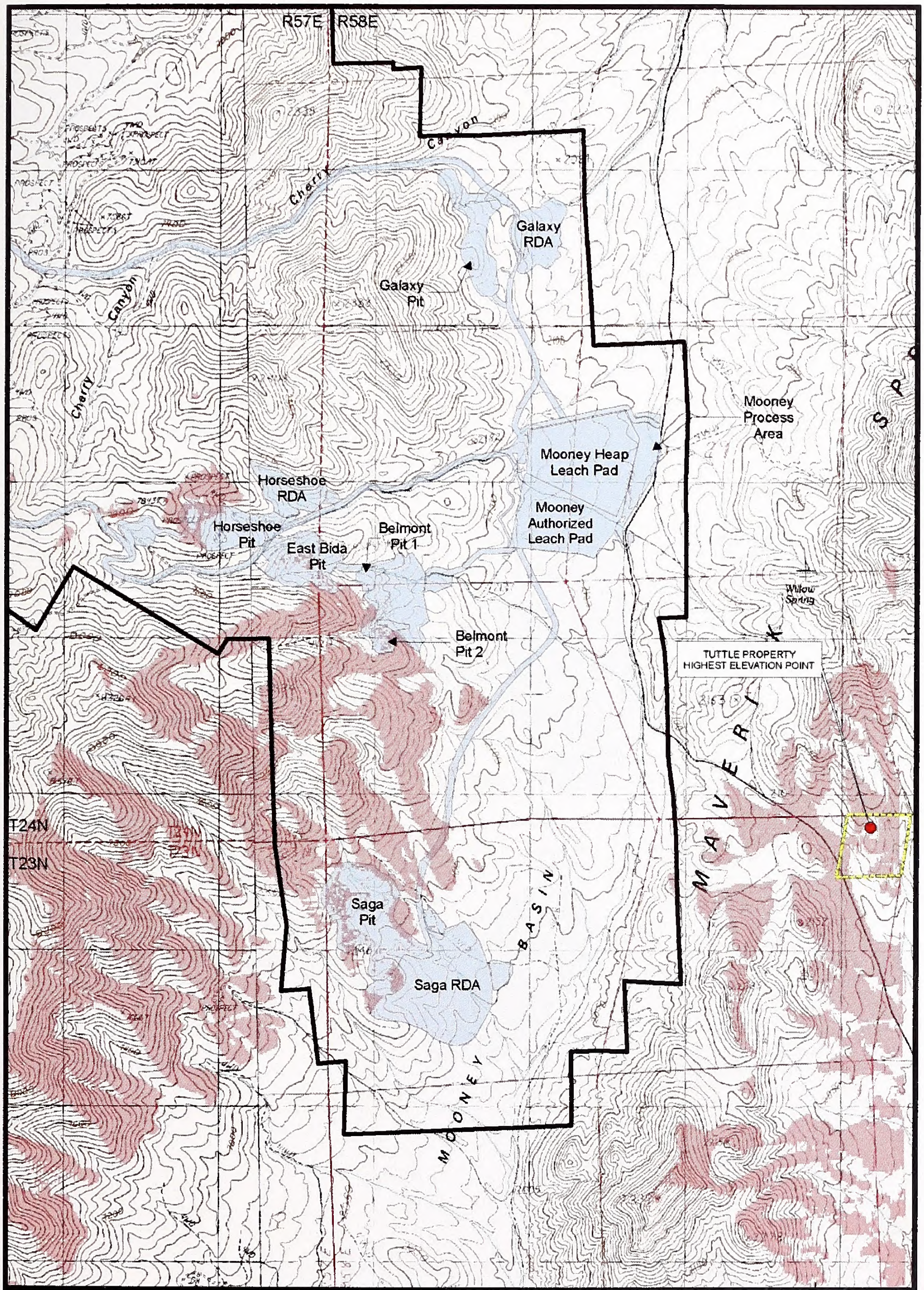
Response No. G-16: *Visual resource management designations apply only to public lands. However, additional analysis was performed to assess the visual impact of the project as seen from the Tuttle property (see Response G-4).*

Response No. G-17: *Table 3-16 lists administrative land use authorizations for public land only. Since the Tuttle property is private land, it is not listed in Table 3-16.*

Response No. G-18: *Class I and Class II areas are defined in Section 3.14.1 under the Regulatory Framework section of the FEIS. The nearest Class I airshed is the Jarbidge Wilderness near the Idaho border (see Response G-11).*

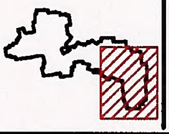
Response No. G-19: *As discussed in Section 4.14.2 of the FEIS, mercury air quality impacts and deposition were modeled at the project area and beyond. Mercury impacts associated with the Proposed Action were shown to represent less than 10% of the total natural background mercury deposition in any watershed and less than 1% of natural background mercury deposition rate in any watershed not draining from the project area. Figure 4-3 of the FEIS indicates the percentage of mercury deposition from BMM for the combination of Long Valley and Ruby Valley. The Tuttle property is located in the divide between those two valleys. Also, the facility will install and operate mercury controls that meet Nevada Maximum Achievable Control Technology requirements.*

Response No. G-20: *Only reasonably foreseeable future actions are included in Table 4-2; potential development of this property is considered too speculative to be considered a reasonably foreseeable future action at this time.*



Legend

- Viewshed Observation Point
- Not Visible From Tuttle Property
- Visible From Tuttle Property
- NE 1/4 of NE 1/4 T23N R58E Section 5
- Proposed Project Boundary
- Authorized Disturbance Area



Base image: USGS 24k DRG

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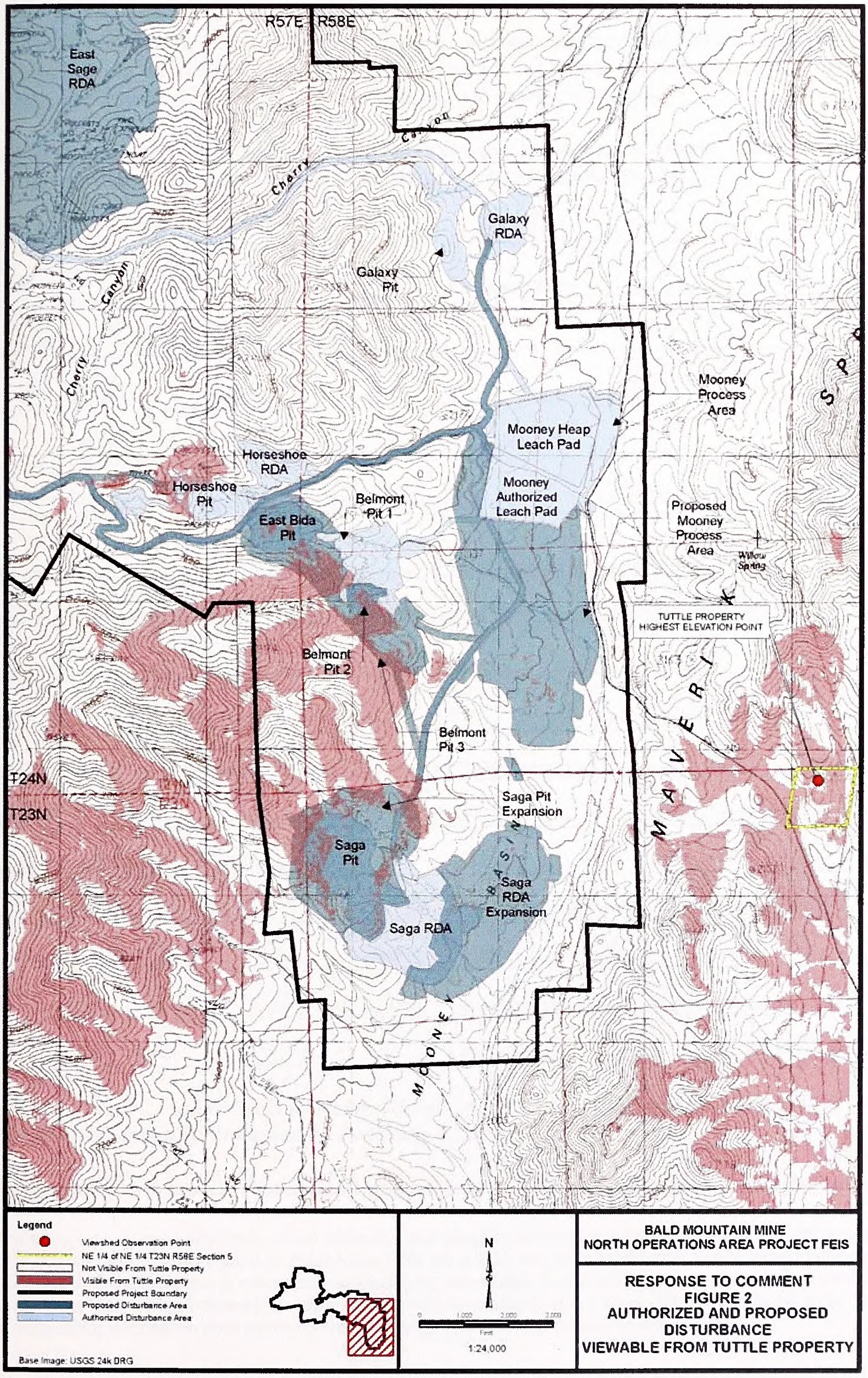
BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

RESPONSE TO COMMENT
FIGURE 1

EXISTING AND AUTHORIZED DISTURBANCE VIEWABLE FROM TUTTLE PROPERTY



BALD MOUNTAIN MINE
NORTH OPERATIONS AREA PROJECT FEIS

RESPONSE TO COMMENT
FIGURE 2
AUTHORIZED AND PROPOSED
DISTURBANCE
VIEWABLE FROM TUTTLE PROPERTY

H

Bald Mountain Mine North Operations Area Project
Draft Environmental Impact Statement

Draft EIS Public Meeting Comment Form

Informed decisions are better decisions: The Bureau of Land Management (BLM) believes that extensive public involvement will serve to improve communication, develop enhanced understanding of different perspectives, and identify solutions to issues and problems. We look forward to hearing from you.

Where to provide comments: You can hand this form in at a public scoping meeting or mail it in using the address on reverse. ***Comments can also be provided via email to: Lynn_Bjorklund@blm.gov.***

Name Kenneth Moss County Elko

Title ______ Organization ______

Mailing Address 550 13th Street

City Elko State NV Zip 89801

Email Ken.moss@yahoo.com

Date Jan 7 2009 Meeting Location (if applicable) Elko BLM office

☐ Please check box if you do **not** want your name released when comments are made public.

☒ Please check box if you want to receive a hard copy of the Final Environmental Impact Statement and Record of Decision.

COMMENT *(use back side if you need additional space or attach additional sheets)*

As I understand this proposal it is for a continuation of an existing ~~project.~~ ~~Busin~~ business. The area has supported mining for several decades -- you might say the area is zoned mining. The jobs will benefit Elko, White Pine and Eureka counties. My observation of Barrick as a company is that they ~~are~~ consider the environments ~~and~~ the inhabitants of the area, both people and animals. I am in favor of allowing the mine to continue and expand its operations.

To Return via US Mail: Fold in thirds so BLM address (on reverse) is showing, add postage, tape bottom of fold, and mail. ***Please have comments postmarked by February 2, 2009.***

To provide comments via email: Please email comments to: Lynn_Bjorklund@blm.gov ***by February 2, 2009.***

Comments, including names, street addresses, e-mail addresses, and phone numbers (if provided) of respondents will be available for public review at the BLM Ely District Office during regular business hours (7:30 am to 4:30 pm), Monday through Friday, except holidays. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Response No. H-1: *Statements noted.*

I-1

Bald Mountain Mine North Operations Area Project
Draft Environmental Impact Statement

Draft EIS Public Meeting Comment Form

Informed decisions are better decisions: The Bureau of Land Management (BLM) believes that extensive public involvement will serve to improve communication, develop enhanced understanding of different perspectives, and identify solutions to issues and problems. We look forward to hearing from you.

Where to provide comments: You can hand this form in at a public scoping meeting or mail it in using the address on reverse. *Comments can also be provided via email to: Lynn_Bjorklund@blm.gov.*

Name LARSON R. Dill County Elko

Title Shoshone - South Fork Organization Te-moak, South Fork WSDP

Mailing Address HR-30 PO, BOX 260

City Spring Creek State NV. Zip 89815

Email

Date 1/8/07 Meeting Location (if applicable) Elko

☐ Please check box if you do not want your name released when comments are made public.

☒ Please check box if you want to receive a hard copy of the Final Environmental Impact Statement and Record of Decision.

COMMENT *(use back side if you need additional space or attach additional sheets)*

1 I Believe That BLM is supposed to be The care Takers of The lands of Nevada. also lands That The Shoshone nation owns by a treaty of 1863. Barrick Needs Not To expand any further because of standing court case. BLM should check out The Record of Barrick world wide, it is not a pretty picture. Nevada is cattle country, ~~[illegible]~~ lands are very pretty for outdoor Rec. Not for mining at This extent. Barrick will turn Nevada into a wasteland. Every Thing of The lands belongs to The Shoshone, and was to be shared. Nevada should keep what is Nevada's. Residents should speak up to save This land. (See Cerds decision) treaty 1863 - (Animals Birds - Insects ect. People, Cultures, Cattle People, sportsmen. Young Children, Babies.

To Return via US Mail: Fold in thirds so BLM address (on reverse) is showing, add postage, tape bottom of fold, and mail. *Please have comments postmarked by February 2, 2009.*

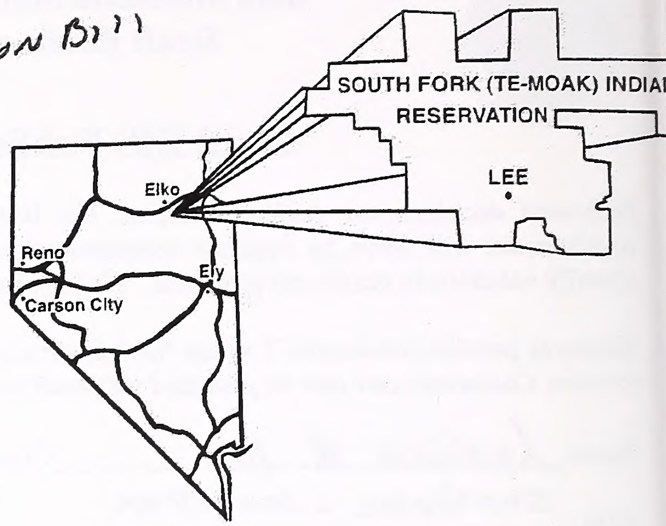
To provide comments via email: Please email comments to: Lynn_Bjorklund@blm.gov *by February 2, 2009.*

I-2

SOUTH FORK BAND COUNCIL
SOUTH FORK INDIAN RESERVATION
21 LEE, B-13
RING CREEK, NEVADA 89815

775-744-4273 FAX 775-744-4523

LARSON Bill



RESOLUTION OF THE GOVERNING BODY
OF THE
SOUTH FORK BAND INDIAN RESERVATION

Resolution No. 07-SF-18

BE IT RESOLVED BY THE SOUTH FORK BAND COUNCIL:

WHEREAS, this is a constituent Band of the Te-Moak Tribe, known as the South Fork Band Council, as defined by the Indian Reorganization Act of June 18, 1934, as amended and operates and functions in accordance with the Constitution of Te-Moak Tribe of Western Shoshone Indians of Nevada, and

WHEREAS, the South Fork Band Council is the governing body of the South Fork Indian Reservation, and is empowered by the Constitution to promote and protect the welfare of its members, and to enact all ordinances and resolutions which shall be necessary and proper for carrying into effect the foregoing powers, and

I-2 **WHEREAS**, the South Fork Band Council makes its comment on the proposed mining for molybdenum at Mt. Hope, north of Eureka Nevada, which will affect areas that have many cultural and traditional values to Shoshone people, and

WHEREAS, there will be destruction of pine nut gathering areas, springs for the wildlife and bird life and there are many medicine plants that will be gone and there will be acid rock drainages for a long time, and

WHEREAS, the Shoshone people again will lose part of their heritage and traditional and religious values in this area, and many cattle ranchers will lose good grazing areas, and

WHEREAS, the Bureau of Land Management has again acted on this Mt. Hope Project without prior input from the Shoshone people.

NOW THEREFORE BE IT RESOLVED that the South Fork Band Council hereby opposes the Mount Hope Project in its entirety for the protection of the lands, water, and animal life that exists in the project area and that the BLM and Idaho General Mines respect the lands of the Shoshone People and not proceed with the project which will cause future destruction to life giving resources for all people.

BE IT FURTHER RESOLVED THAT, the South Fork Band Council encourages the Te-Moak Tribal Council to become more involved in these mining issues on behalf of the Western Shoshone People.

I-2

- CERTIFICATION -

I, the undersigned as Chairman of the South Fork Band Council do hereby certify that the South Fork Band Council is composed of seven (7) members, of whom **6** constituting a quorum were present at a Special Meeting duly held on the 26th day of June 2007, and that the forgoing resolution was duly adopted at such meeting by a vote of **6 for, 0 against,** and **0 abstentions,** pursuant to Article 4, Section 12 (a) and (b) and Section 13 of the Constitution of the Te-Moak Tribe of Western Shoshone Indians of Nevada.

Cheryl Mose-Temoke, Chairman
South Fork Band Council

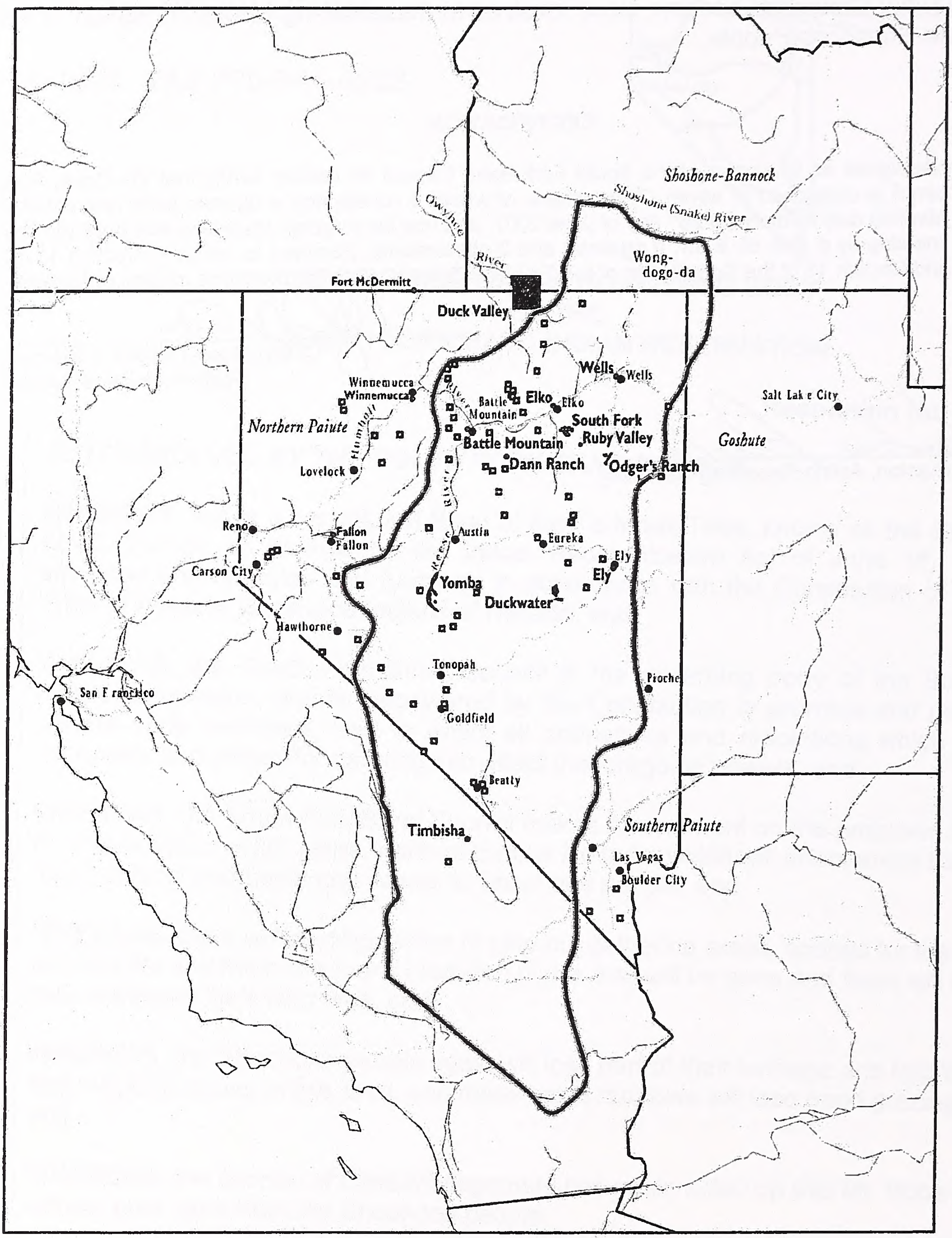
Attest:

Kristine Preston, Acting Recording Secretary

Carson Bill

Newe Sogobia and Nevada Gold Mines

[the people's earth mother]



Newe Sogobia
(Western Shoshone National Council-1980's*
edited to boundary drawn with assistance from Chief Raymond Yowell)

Shoshone Land Base (1994)*

Timbisha Shoshone Community

Winnemucca Other Native Communities with Shoshone populations

Gold Mines

* Steven J. Crum, *The Road On Which We Came*. University of Utah Press, 1994

-4

LARSON B111

COMMITTEE FOR THE ELIMINATION OF RACIAL DISCRIMINATION
Sixty- eighth session
Geneva, 20 February – 10 March 2006

EARLY WARNING AND URGENT ACTION PROCEDURE

DECISION 1 (68)

UNITED STATES OF AMERICA

A. Introduction

1. At its 67th session held from 2 to 19 August 2005, the Committee considered on a preliminary basis requests submitted by the Western Shoshone National Council, the Timbisha Shoshone Tribe, the Winnemucca Indian Colony and the Yomba Shoshone Tribe, asking the Committee to act under its early warning and urgent action procedure on the situation of the Western Shoshone indigenous peoples in the United States of America.

2. Considering that the opening of a dialogue with the State party would assist in clarifying the situation before the submission and examination of the fourth and fifth periodic reports of the United States of America, due on 20 November 2003, the Committee, in accordance with article 9 (1) of the Convention and article 65 of its rules of procedure, invited the State party, in a letter dated 19 August 2005, to respond to a list of questions, with a view to considering this issue at its 68th session.

I-4 3. Responding to the Committee's letter, the State party, in its letter dated 15 February 2006, stated that its overdue periodic reports are being prepared and that they will include responses to the list of issues. The Committee regrets that the State party has not undertaken to submit its periodic reports by a specific date, that it has not provided responses to the list of issues by 31 December 2005 as requested, and that it did not consider it necessary to appear before the Committee to discuss the matter.

4. The Committee has received credible information alleging that the Western Shoshone indigenous peoples are being denied their traditional rights to land, and that measures taken and even accelerated lately by the State party in relation to the status, use and occupation of these lands may cumulatively lead to irreparable harm to these communities. In light of such information, and in the absence of any response from the State party, the Committee decided at its 68th session to adopt the present decision under its early warning and urgent action procedure. This procedure is clearly distinct from the communication procedure under article 14 of the Convention. Furthermore, the nature and urgency of the issue examined in this decision go well beyond the limits of the communication procedure.

B. Concerns

5. The Committee expresses concern about the lack of action taken by the State party to follow up on its previous concluding observations, in relation to the situation of the Western Shoshone peoples (A/56/18, para. 400, adopted on 13 August 2001). Although these are indeed long-standing issues, as stressed by the State party in its letter, they warrant immediate and effective action from the State party. The Committee therefore considers that this issue should be dealt with as a matter of priority.

6. The Committee is concerned by the State party's position that Western Shoshone peoples' legal rights to ancestral lands have been extinguished through gradual encroachment, notwithstanding the fact that the Western Shoshone peoples have reportedly continued to use and occupy the lands and their natural resources in accordance with their traditional land tenure patterns. The Committee further notes with concern that the State party's position is made on the basis of processes before the Indian Claims Commission, "which did not comply with contemporary international human rights norms, principles and standards that govern determination of indigenous property interests", as stressed by the Inter-American Commission on Human Rights in the case *Mary and Carrie Dann versus United States* (Case 11.140, 27 December 2002).

I-4

7. The Committee is of the view that past and new actions taken by the State party on Western Shoshone ancestral lands lead to a situation where, today, the obligations of the State party under the Convention are not respected, in particular the obligation to guarantee the right of everyone to equality before the law in the enjoyment of civil, political, economic, social and cultural rights, without discrimination based on race, colour, or national or ethnic origin. The Committee recalls its General recommendation 23 (1997) on the rights of indigenous peoples, in particular their right to own, develop, control and use their communal lands, territories and resources, and expresses particular concern about:

a) Reported legislative efforts to privatize Western Shoshone ancestral lands for transfer to multinational extractive industries and energy developers.

b) Information according to which destructive activities are conducted and/or planned on areas of spiritual and cultural significance to the Western Shoshone peoples, who are denied access to, and use of, such areas. It notes in particular the reinvigorated federal efforts to open a nuclear waste repository at the Yucca Mountain; the alleged use of explosives and open pit gold mining activities on Mont Tenabo and Horse Canyon; and the alleged issuance of geothermal energy leases at, or near, hot springs, and the processing of further applications to that end.

c) The reported resumption of underground nuclear testing on Western Shoshone ancestral lands;

d) The conduct and / or planning of all such activities without consultation with and despite protests of the Western Shoshone peoples;

e) The reported intimidation and harassment of Western Shoshone people by the State party's authorities, through the imposition of grazing fees, trespass and collection notices, impounding of horse and livestock, restrictions on hunting, fishing and gathering, as well as arrests, which gravely disturb the enjoyment of their ancestral lands.

f) The difficulties encountered by Western Shoshone peoples in appropriately challenging all such actions before national courts and in obtaining adjudication on the merits of their claims, due in particular to domestic technicalities.

C. Recommendations

8. The Committee recommends to the State party that it respect and protect the human rights of the Western Shoshone peoples, without discrimination based on race, colour, or national or ethnic origin, in accordance with the Convention. The State party is urged to pay particular attention to the right to health and cultural rights of the Western Shoshone people, which may be infringed upon by activities threatening their environment and/or disregarding the spiritual and cultural significance they give to their ancestral lands.

9. The Committee urges the State party to take immediate action to initiate a dialogue with the representatives of the Western Shoshone peoples in order to find a solution acceptable to them, and which complies with their rights under, in particular, articles 5 and 6 of the Convention. In this regard also, the Committee draws the attention of the State party to its General recommendation 23 (1997) on the rights of
I-4 indigenous peoples, in particular their right to own, develop, control and use their communal lands, territories and resources.

10. The Committee urges the State party to adopt the following measures until a final decision or settlement is reached on the status, use and occupation of Western Shoshone ancestral lands in accordance with due process of law and the State party's obligations under the Convention:

a) Freeze any plan to privatize Western Shoshone ancestral lands for transfer to multinational extractive industries and energy developers;

b) Desist from all activities planned and/or conducted on the ancestral lands of Western Shoshone or in relation to their natural resources, which are being carried out without consultation with and despite protests of the Western Shoshone peoples;

c) Stop imposing grazing fees, trespass and collection notices, horse and livestock impoundments, restrictions on hunting, fishing and gathering, as well as arrests, and rescind all notices already made to that end, inflicted on Western Shoshone people while using their ancestral lands.

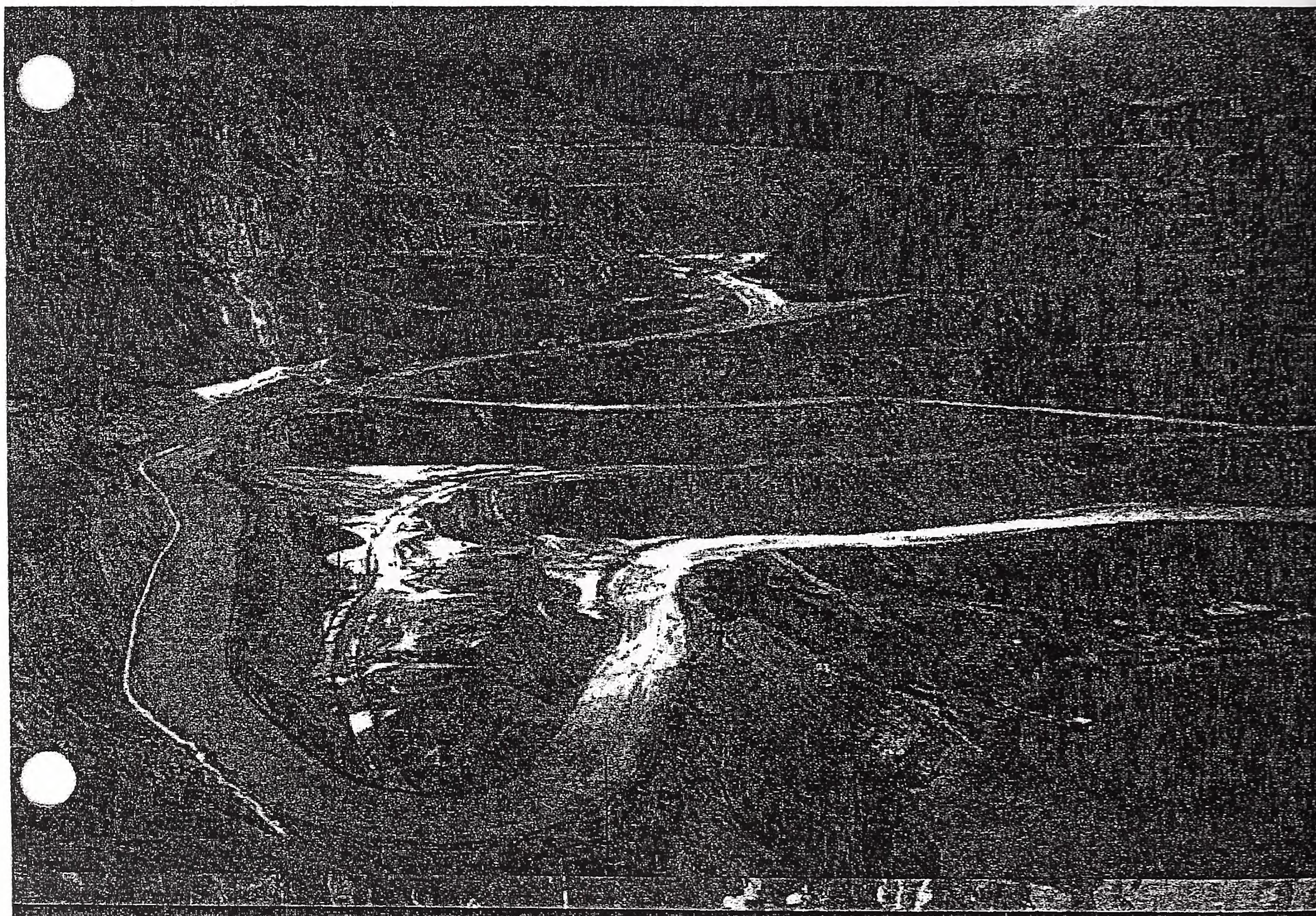
11. In accordance with article 9 (1) of the Convention, the Committee requests that the State party provide it with information on action taken to implement the present decision by 15 July 2006.

I-5

A CORPWATCH REPORT

BARRICK'S **DIRTY SECRETS**

COMMUNITIES WORLDWIDE RESPOND TO **GOLD MINING'S IMPACTS**



An Alternative Annual Report, May 2007

TABLE OF CONTENTS

Title Credits: Design by Tim Simons; Photo: Marinduque Mine Pit (page 18), Catherine Coumans
Top photos from left to right: March against Barrick in Vallenar, Chile June 2005 (page 24), Luis Manuel Claps; Small-sclae Miners in Tanzania (page 5), Mustafa Iroga; Lake Cowal mine convergence (page 6, 24), Natalie Lowrey

BLM -
Read -Review & deny 1 Reject
Nevada is not a waste land.
Look at Nevada as your home or
Back yard for the young.
Look at human Rights Violations.

Fact:

Mining Enterprises

Use 7-10% world energy

Output < 1% world GNP

Jobs < 0.5% world jobs

SOURCE: "EL EXILIO DEL CONDOR: HEGEMONIA TRANSNACIONAL EN LA FRONTERA. EL TRATADO MINERO ENTRE CHILE Y ARGENTINA" (OLCA), 2004.

INTRODUCTION

This report, a profile of Barrick Gold, the world's largest gold mining company, is an illustration of what is wrong with the gold industry today. In these pages, you will find numerous examples in which Barrick's interests and the interests of the communities within which it operates are pitted directly against each other. From avoiding responsibility for the destructive environmental legacy of their projects or aligning itself with corrupt politicians, to employing police who violently suppress (and sometimes kill) mine critics, Barrick's power in these struggles creates a compelling case for intervention.

The community groups fighting Barrick include members ranging from local government and tribal officials, to assemblies of mothers against mining and other grassroots groups that attract thousands of supporters. Their work is courageous and dedicated, as it is dangerous and exhausting; and it serves to illustrate the on-the-ground reality for Barrick and other companies like it. Needless to say, this rarely voiced perspective on mining does not bode well for the industry as a whole, as it comes from the people who are immediately affected by its operations.

This report also serves to illustrate that these issues are not isolated instances of abuse, but are part of a system and framework within which these abuses are inevitable. Canada, where Barrick is based, is home to 60 percent of the world's mining corporations, which run operations across the globe. Despite being a leader in this industry, Canada has not taken the lead on mediating or taking responsibility for the behavior of their corporations abroad.

As a consequence of this negligence, Canada has drawn criticism from around the world, first by environmental, religious and human rights organizations, and now increasingly from international institutions, such as the United Nations. Even the Canadian government has started to recognize the harsh reality accompanying the presence of their mining industry abroad, which is characterized by environmental destruction, political corruption, community struggles, human rights abuses, and massive amounts of water consumption.

2006 marked the year of the first National Roundtables on Corporate Social Responsibility and the Canadian Extractive Industry in Developing Countries, a forum that was organized in reaction to a 2005 Report from Canada's Parliamentary Standing Committee on Foreign Affairs. The standing committee's report admitted that Canada does not have laws ensuring that Canadian mining companies "conform to human rights standards, including the rights of workers and indigenous peoples." But, despite overwhelming evidence that the self-regulation and voluntary measures adopted by mining companies are not sufficient to guarantee these rights, a binding legal framework to ensure these rights has yet to be pursued by the Canadian Government.

We hope that this broad collection of case studies examining Barrick's operations around the world will serve to expose an industry rife with abuse, while supporting the individual community-based struggles against this company worldwide.

ENVIRONMENT:

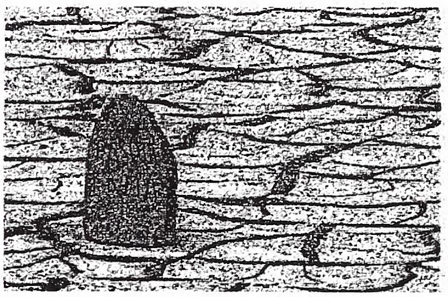
WATER IS WORTH MORE THAN GOLD

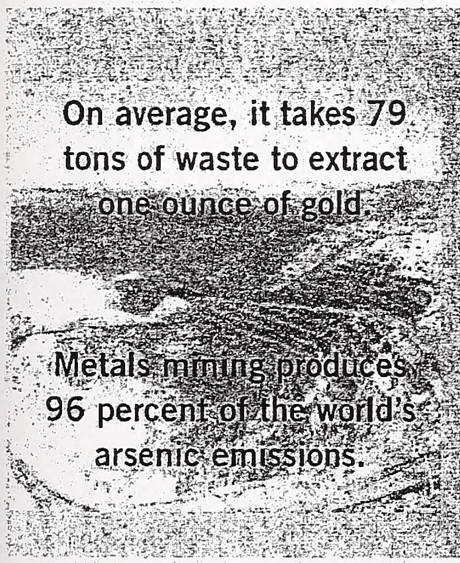
Water depletion is a major negative consequence of gold mining, as you can see highlighted in the Lake Cowal, Pascua Lama, and Western Shoshone case studies. The large amount of water required to run a gold mining operation exacerbates its impact on local communities, many of which are already experiencing drought.

The daily water consumption at Barrick's Lake Cowal mine in Australia is more than of the entire Lismore district (a major regional center in the Northern Rivers region of the state.) Since the mine started operations, the water level near it has dropped from 20 meters to 50 meters below ground level. The mine is licensed to use up to 3,650 million liters a year over the next 13 years and will likely exceed that figure. Meanwhile, the region surrounding the mining site is enduring its eighth year of drought.[1]

At its Pascua Lama mine, Barrick is disturbing 10.2 acres of three glaciers[2], and has called for tunnels to be dug underneath them. The exploration and prospecting phase (1990's) has already been linked to the depletion of glaciers.[3] Barrick attempted to blame global warming for the melting, but those claims have been disproved.[4]

In addition to the large-scale melting of the glaciers, Barrick is proposing to extract additional water in Chile to run its mine and factories. The estimated requirement is up to 42 liters per second to be taken from the Estrecho and Toro Rivers. [5]





Acid Mine Drainage and Heavy Metal Contamination

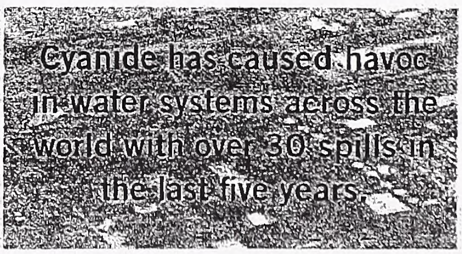
Open-pit mining creates great waste for a small yield. On average, it takes 79 tons of waste to extract one ounce of gold, according to a conservative estimate by the No Dirty Gold campaign, a project of EarthWorks and Oxfam. The process involves grinding up ore and then exposing it to cyanide in order to extract the gold. Sulfides in the crushed rocks interact with air and water to create sulfuric acid, which in turn creates acid mine drainage (AMD).

In and of itself, AMD is harmful to ecosystems because it makes water too acidic to support life. Additionally, the sulfuric acid in AMD leaches out other substances from the waste ore, such as arsenic, cadmium, lead and mercury, which can have disastrous health effects, and can contaminate both air and water. Metals mining has been linked to 96 percent of the world's arsenic emissions.[6]

A recent report by the University of Nevada[7] found startlingly high mercury concentrations in the air around a number of northern Nevada gold mines. The highest concentration was measured at Barrick's Marigold Mine (3120 ng/m3).

Cyanide

Cyanide is the chemical-of-choice for mining companies to extract gold from crushed ore, despite the fact that leaks or spills of this chemical are extremely toxic to fish, plant life and human beings. Cyanide is a deadly chemical, used in the gas chambers of the Second World War and on death row in the United States between 1930-1980. The chemical has caused havoc in water systems across the world with over 30 spills in the last five years.[8] *(See Lake Cowal spread for more information on cyanide)*



TITLE PHOTO: PAPUA NEW GUINEA, DAVID MARTINEZ; "PASCUA LAMA=DESERTIFICATION AND DEATH", DAVID MODERSBACH

ENVIRONMENTAL SCANDAL:

SAN GUILLERMO WILDERNESS:
GOLD MINING IN A WORLD HERITAGE BIOSPHERE RESERVE?

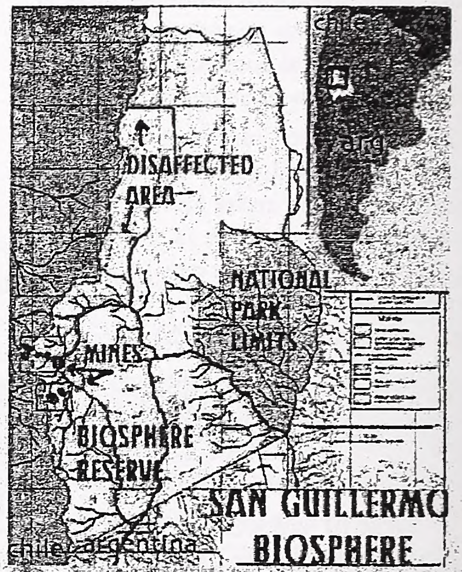
Argentina's first World Biosphere Reserve is the San Guillermo Wilderness, high in the Andes range in northwest province of San Juan, which was given legal protection in 1980 by the United Nations Educational, Scientific and Cultural Organization (UNESCO).[9] The 900.000 hectare reserve provides crucial ecological services for the entire Southern Andean Steppe bioregion: It provides habitat and mating grounds for hundreds of animal species, such as Andean flamenco, vicuñas, guanaco and ñandu; it is home to many unique and important plant species; it regulates bioregional climate patterns; and most importantly, it is the birthplace of the waters that flow down into an enormous larger region of Argentina and Chile.

The heart of San Guillermo lies in its glaciers nested in its highest peaks. These glaciers, some brilliant white, others underground and invisible to the eye, regulate the runoff forming the Cura and Jáchal rivers, the only water supply to the delicate desert farmlands of northern San Juan. These same glacier "water factories" also supply and regulate the waters flowing westward to the Pacific through Chile's fertile Huasco Valley. The water supplies created and regulated within San Guillermo are essential to the life of ecological and social systems downstream.

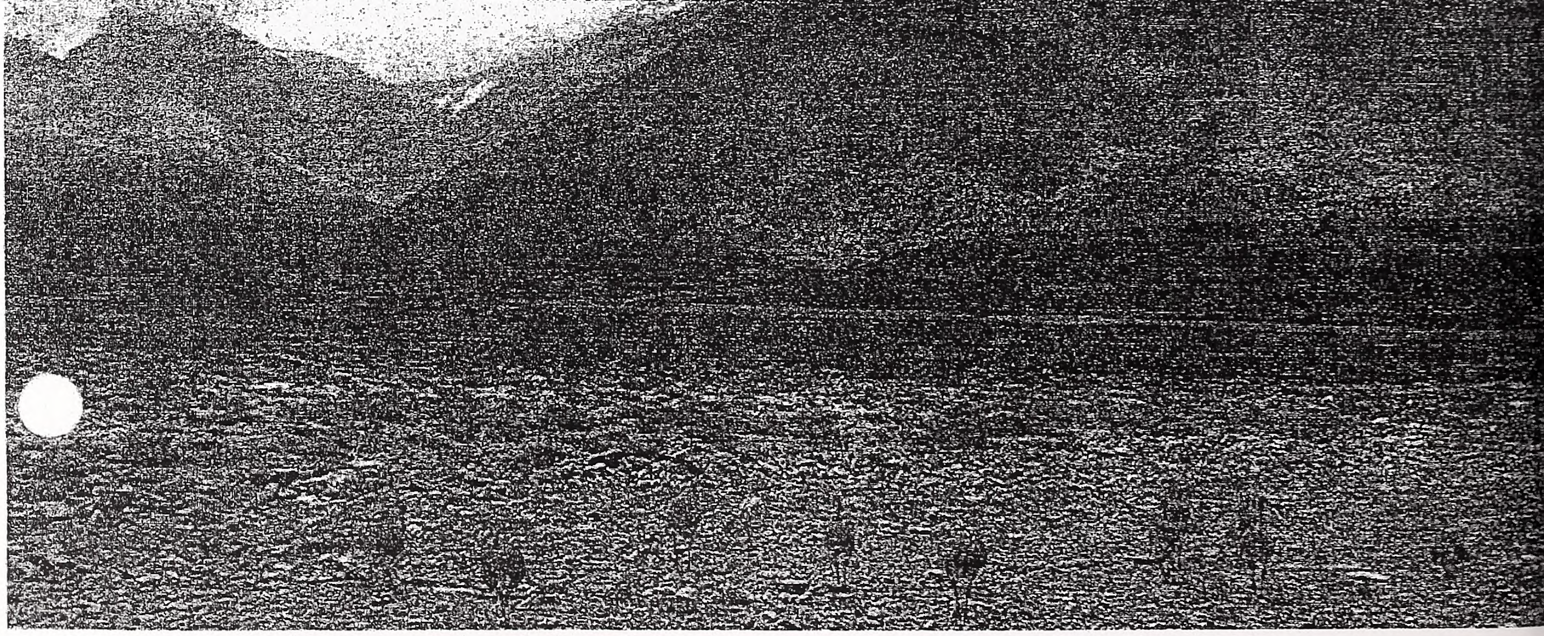
In 1989, the very heart of the San Guillermo World Biosphere Reserve was "cut away," stripped from the UNESCO reserve. In a midnight session of the San Juan legislature, corrupt provincial lawmakers secretly drafted a bill (N°5959/89) "disaffecting" a strip of some 170,000 hectares from UNESCO protection – land that had already been prospected for mining and would later be transferred to Barrick Gold Corporation for its Veladero and Pascua-Lama projects.[10]

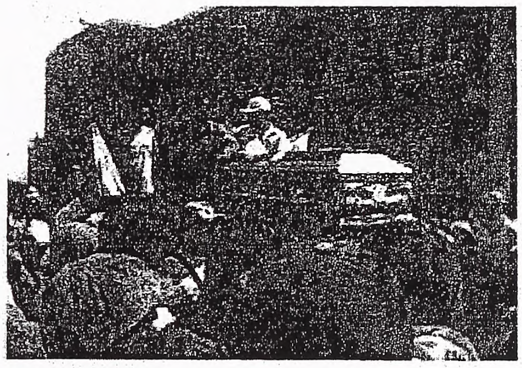
The change in the law was not announced publicly, provincially or even to UNESCO until ten years later in 1999, after the mapping and initial explorations were completed. During these years, land rights were covertly and often illegally bought for pennies per acre[11] by well-connected local officials, who simply signed public land over to subsidiaries of Barrick Gold for handsome profits.[12] They often purchased the land from poor and indigenous peoples.[13]

This 1989 "disaffection" is now the "legal" basis for Barrick's open-pit gold mining operations among the glaciers of San Guillermo World UNESCO Man and Biosphere Reserve.[14] The protests of local and national community and environmental groups ,as well as UNESCO, have been completely ignored by provincial authorities. UNESCO also claims it has no power to enforce the respect of the limits of this now gravely endangered Biosphere.[15]



BELOW: NANDÚES RUN WILD NEAR PASCUA LAMA. PHOTO: DAVID MORDERSBACH





POLICE REPRESSION:

WARNING: RESISTANCE TO BARRICK MAY LEAD TO DEATH

On April 11, 2007 Marvin Gonzalez Castillo, a 19 year old boy, was killed by two bullets to his torso. He was a victim of police repression against protests organized by social and ecological organizations, as well as the local government of Ancash, to demand the cancellation of the contracts with the mining firms, Barrick Gold and Antamina*, according to community reports. The police moved in during the blocking of roads. Thirty demonstrators were also detained, most of them construction workers. One woman died of a heart attack after the police tear-gassed protesters.[27]

> This isn't the first time that people have died in a confrontation with police at an anti-mining demonstration.

This protest was part of a regional 48 hour strike, was part of a series of coordinated actions that included thousands of marchers throughout the Ancash region.

Two days before the shooting, on the first day of actions, a group from the communities of Shecta and Santiago Antunez de Mayolo attacked peaceful demonstrators as they protested against Barrick's continued exploration of the Condorwain mountain area. They were supported by members of the National Police and workers from the Barrick Misquichilca mining company. The confrontation between community members left seven people injured, among them the president of the Campesino community of Cruz Pampa and leaders of other villages near Condorwain.[28]

Another group of residents of Huaraz met in the center of the city to march in opposition to the mining activities in different locations throughout the Ancash region.[29]

LONGSTANDING ANGER WITH BARRICK

This isn't the first time that people have died in a confrontation with police at an anti-mining demonstration. On May 5, 2006, Joel Martel Castromonte, a 25 year old agronomy student and Guillermo Tolentino Abat, a 42 year old miner were shot dead by police. They were victims of the violence that began when hundreds of community members gathered in Huallapampa to request a salary increase from Barrick Gold. When Barrick officials refused to raise pay, community members used stones and tree trunks to blocked access roads to the mines. Police, called by Barrick, responded with tear gas bombs, and the protesters answered with stones. According to police spokespeople, the mining company employed 30 police agents in its security force.[30]

Barrick suspended operations until security was reestablished, but not before the injuries and deaths. The following day, thousands of campesinos from the 18 communities in the high reaches of the Sechta mountains where Barrick operates the Gold Pierina Mines, protested. They demanded investigations of the deaths and justice.[31]

One year before in the same area, riot police had clashed with thousands of protesters demonstrating against a court decision allowing Barrick to waive $141 million in taxes.[32]

Police used tear gas to disperse the farmers, teachers, and striking city hall workers who had gathered on the mountain road leading to Barrick's Pierina mine in the Ancash region, authorities said.[33] Twenty people, including two police officers, were injured in the clashes and Ancash Mayor Lombardo Mautino was hurt by a rubber bullet, Ancash city hall official Pelayo Luciano told *Reuters*.[34]

**Barrick officials say that this particular death occured at a protest in Chimbote, a coastal region in the Ancash Region, 500 kilometers away from the mines. It should be noted this protest was part of regional protests that were called for by CORECAMI Ancash (The regional Confederation of Communities Affected by Mining in Ancash), though this particular protest was against large-scale infrastructure projects.*

TITLE PHOTO: ON APRIL 11, 2007 MARVIN GONZALEZ CASTILLO, A 19 YEAR OLD BOY, WAS KILLED BY TWO BULLETS TO HIS TORSO. PHOTO: DEMOCRACIAPOPULAR.BLOGSPOT.COM
BELOW: DURING THE REGIONAL 48 HOUR STRIKE, THOUSANDS OF DEMONSTRATORS MARCHED THROUGHOUT THE ANCASH REGION. PHOTO: [illegible]

HUMAN RIGHTS:

LIVES AND LIVELIHOODS IN TANZANIA AND PAPUA NEW GUINEA

Human rights abuse used to be the work of repressive governments, but increasingly corporations are getting into the act. In late 2005, Canada's Parliamentary Standing Committee on Foreign Affairs lamented that "Canada does not yet have laws to ensure that the activities of Canadian mining companies in developing countries conform to human rights standards, including the rights of workers and indigenous peoples." [16]

Barrick was linked to a number of these abuses, including the forced evictions of small scale miners and residents,[17] the alleged murder of mine critics at their Bulyanhulu and North Mara gold mines in Tanzania, and the killing of alluvial miners by mine security personnel in Papua New Guinea. Many violent clashes have also occurred between police and activists opposing Barrick's mining operations in Peru, Chile, and Argentina.[19]

Some of the abuses at Bulyanhulu mine occurred before Barrick took over. In August 1996, Canada-based Sutton Resources Ltd evicted some 30,000 to 250,000 miners from its Tanzanian operation and allegedly killed more than 50 miners by burying them alive with a bulldozer, according to Tanzanian environmental lawyer Tundu Lissu.[20] Barrick bought this mine three years later and has done nothing to bring the perpetrators to justice or to compensate victims' families. After the mass evictions, Lissu claims that hundreds of villagers, including community leaders and prominent locals, were targeted for illegal arrests, criminal prosecutions and long-term imprisonment. *(see sidebar)*

Lissu's claims are supported by an independent fact finding mission that included representatives of MiningWatch Canada, Friends of the Earth-US, the Dutch NGO Both ENDS, and a Canadian journalist. After visiting the Tanzania in March 2002, the group concluded that "the intensity and seriousness in the telling of the stories of the alleged evictions, the violence and brutality of the police and mining officials, the level of detail, as well as the willingness of the Bulyanhulu residents to take significant risks to their own personal safety to come and speak with us, impressed the members of the mission, as did the willingness of apparently 250 others who waited several hours for us to arrive in Bulyanhulu. The mission members thought that these factors lent weight to the credibility of the allegations." [21]

Subsequently, the Compliance Advisor/Ombudsman of the World Bank issued a report refuting LEAT's claims of mass murder and the number of people displaced, based on evidence supplied by the Tanzanian government and Barrick Gold. LEAT published a detailed response to the CAO report on their website, which challenged this evidence.

Similarly, Barrick's North Mara mine suffered great human rights abuses under its predecessor, Canada's Placer Dome. Lissu, who has been jailed for anti-mining activism, claims that Barrick's security operatives at the North Mara mine have since been linked to six violent deaths and that the killings are part of a strategy to silence mine critics. [22]

MEN WHO MOIL FOR GOLD PHOTO: MUSTAFA IROGA

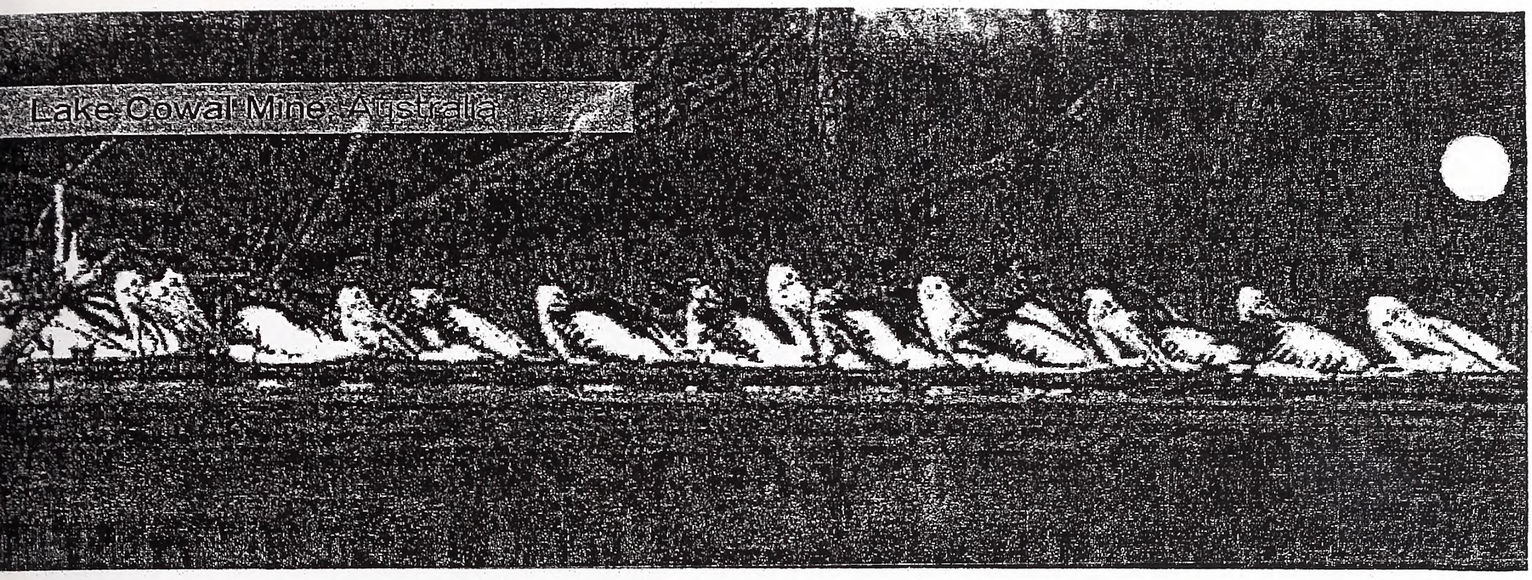
"Mr. Iroga's farm was bulldozed while he himself was serving a 30 months prison sentence for allegedly inciting villagers to re-occupy their farmlands and mine pits in June 2001. In the aftermath of the August 2001 forced evictions by Tanzania security forces, the Iroga brothers, then Kewanja Village Chairman Augustino Nestory Sasi, Chacha Zakayo Wangwe (now elected Member of Parliament for Tarime), John Mang'enyi (then elected Member of Tarime District Council for Kemambo Ward), and Raphael Dede (then Nyabigena Village Chairman) were arrested and charged with inciting the villagers. Mustafa Iroga and Chacha Wangwe would be acquitted in May 2002 but the rest were sent to prison for 30 months. In February last year the High Court of Tanzania annulled the convictions and sentence declaring that there never was any evidence to convict the four community leaders. While serving their sentences, however, Neto Sasi was - with 13 other villagers - charged with a fictitious charge of armed robbery and jailed for 30 years in April 2003. We got them out on appeal to the High Court of Tanzania in December 2004. The latter declared once again that there never was evidence of wrong-doing on the part of the villagers." – Tundu Lissu, Lawyers' Environmental Action Team (LEAT), 2006.[26]

CorpWatch contacted Barrick's Vince Borg to ask for Barrick's response to these allegations, which were made in July of 2006, but Barrick has not yet responded.

In Papua New Guinea, the Akali Tange Association (ATA) emerged in 2004 to address the on-going human rights abuses perpetrated by the Porgera mine security. According to ATA organizer Jeffery Simpson,[23] 39 people have died and 2,000 have been injured, some by unsafe working conditions and others in the chaos resulting from security crackdowns. An additional 3,000 to 4,000 people have been jailed.

Much of the conflict arises over whether the local tradition of alluvial mining became illegal under arrangements and contracts held by the Porgera gold mine. ATA claims that no Ipili agreed to give up traditional rights.[24]

The company has hired a 400-man security team, which it calls Asset Protection Department, to guard the facility. Over the years, what started as a congenial arrangement has turned into small-scale armed conflict that has caused hundreds of injuries, sometimes 40 to 50 a day, according to the *Ottawa Citizen*.[25]



CASE STUDY:

SACRED HEARTLAND OF THE WIRADJURI NATION

THE CAMPAIGN

Australia's Lake Cowal, "the Sacred Heartland of the Wiradjuri Aboriginal Nation," is the largest inland lake in New South Wales (NSW). A wetland of national and international significance, the lake also provides habitat for many threatened species and birds listed under the International Convention on Wetlands (the Ramsar Convention).[35]

For seven years, a community campaign has focused public attention on the cultural and ecological significance of Lake Cowal. Australian organizations supporting the campaign include the Mooka and Kalara Traditional Owners within the Wiradjuri Nation; the Rainforest Information Center; the Indigenous Justice Advocacy Network; the New South Wales Greens Party; Friends of the Earth Australia; Peacebus' Cyanide Watch; and the Coalition to Protect Lake Cowal, an alliance of more than 21 Australian and 40 international groups.

The mine continues to use enormous amounts of water from a region stricken by the worst drought in recorded history, affecting local communities and water sources. Barrick's bore water licences allow it to take up to 17 million liters per day from underground sources.

THE LAKE

An ephemeral lake lying 45 km north-east of West Wyalong in the Lachlan River plain within the Murray-Darling Basin, Lake Cowal is full an average of seven out of ten years, but can remain dry as it is now, for many years. During major floods, the lake becomes an inland sea, connecting to the Lachlan River, which flows into the Murrumbidgee and then to the Murray, Australia's largest river, now one of the world's ten most threatened rivers.[36] Lake Cowal is included in Australia's Directory of Important Wetlands and listed in the Register of the National Estate.[37]

THE MINE

The Cowal Gold Project covers approximately 26.5 square kilometers of this environmentally fragile region. In 1996, the New South Wales government refused an application from North (WA) Ltd. to mine gold at Lake Cowal on environmental grounds. But in February 1999, despite continuing environmentalists' concerns, a month before a state election and after a second commission of inquiry, the government approved the mine.[38] Rio Tinto bought North in 2000 then sold its Cowal Gold Project interest to US-based Homestake. In December 2001 Homestake merged with Barrick Gold of Canada.

On March 27, 2006, the mine, with a projected life of only 13 years, became fully operational. A month later, Barrick poured the mine's first gold. Now, the company is excavating108 million metric tons of low- to medium-grade ore from an open-cut pit that lies within high water level on the lake's western edge. The final pit needed to extract around 2.7 million ounces of gold will be 1 kilometer long, 825 meters wide, and 325 meters deep.[39] The Coalition to Protect Lake Cowal estimates that this pit will be comparable in size to Uluru (Ayers Rock), Australia's largest monolith.

CULTURAL HERITAGE

Wiradjuri traditional lands cover a third of the NSW land mass. Traditional Owners oppose the mine and charge that Barrick and its predecessors ignored demands to protect cultural objects.[40]

Barrick desecrated sacred ground when it cleared the way for the mine and laid water pipes and an electricity transmission line. The company also felled dozens of river red gum trees that had sheltered Wiradjuri people from the elements for hundreds of years, and held generations worth of historic markings. Wiradjuri cultural items and places have been damaged or destroyed including tens of thousands of stone artifacts, ancient ceremonial areas, marked trees, and traditional camp and tool-making sites.

Artifacts hold individual meaning, but piecemeal artifact collection compromises the integrity of the site and the larger landscape of spiritual significance. Independent archaeologists have dated some local Wiradjuri sites to between 2,000 and 4,000 years old--contemporaries of the Egyptian pyramids. Given Lake Cowal's ancient origins, more archaeological work will likely reveal a much older heritage. Barrick has reportedly collected more than 10,000 artifacts from the mine area, but has refused to release details.[41]

WATER

The mine's continuing use of enormous amounts of groundwater and now the Lachlan River affects local communities and water sources already enduring the worst drought in New South Wales' recorded history. Barrick's bore water licences allow it to take up to 17 million liters per day from underground sources and up to 3650 million liters in any one year.[42] A 30-metre groundwater level drop in October 2006 had up to 80 landholders anxiously watching their livestock and domestic supplies. In late 2006 Barrick cut a deal with local irrigators to use water from the Lachlan instead of bore water.[43] Barrick is building an onsite dam, but it will be useless unless significant rain falls. On April 19, Australia's Prime Minister announced that Murray-Darling irrigators faced a water shut-off unless it rained within the next two months.[44] Barrick and the government will not reveal how much water the company is taking from ground and surface water sources combined and whether its deal with irrigators will continue.

CYANIDE

At Lake Cowal, Barrick processes very low-grade ore with minimal residues of gold. Leaching gold from the ore requires 6,613 tons [6,000 metric tons] per year of cyanide and other hazardous chemicals.[45]

The copious waste from this process flows into open pits separated from the lake by an earthen wall or "bund." The mine tailings are stored within the floodplain in unlined dams 3.5 kilometers from the lake. The two tailings ponds, containing highly toxic chemicals, are a tempting habitat for migratory birds.[46]

Another danger comes from transporting the poisonous cyanide. Up to 6,090 metric tons of the chemical travels 1600 kilometers to Lake Cowal every year from Orica's plant in Gladstone, Queensland. Trains and trucks carry the cyanide to Lake Cowal over 20 rivers, through ten national parks, and past 200 towns. The route traverses densely populated areas of Australia's largest city, Sydney, and the World-heritage-listed Blue Mountains. A 1992 train crash at a Condobolin, NSW level crossing killed two and spread 40 metric tons of cyanide pellets across the ground.[47]

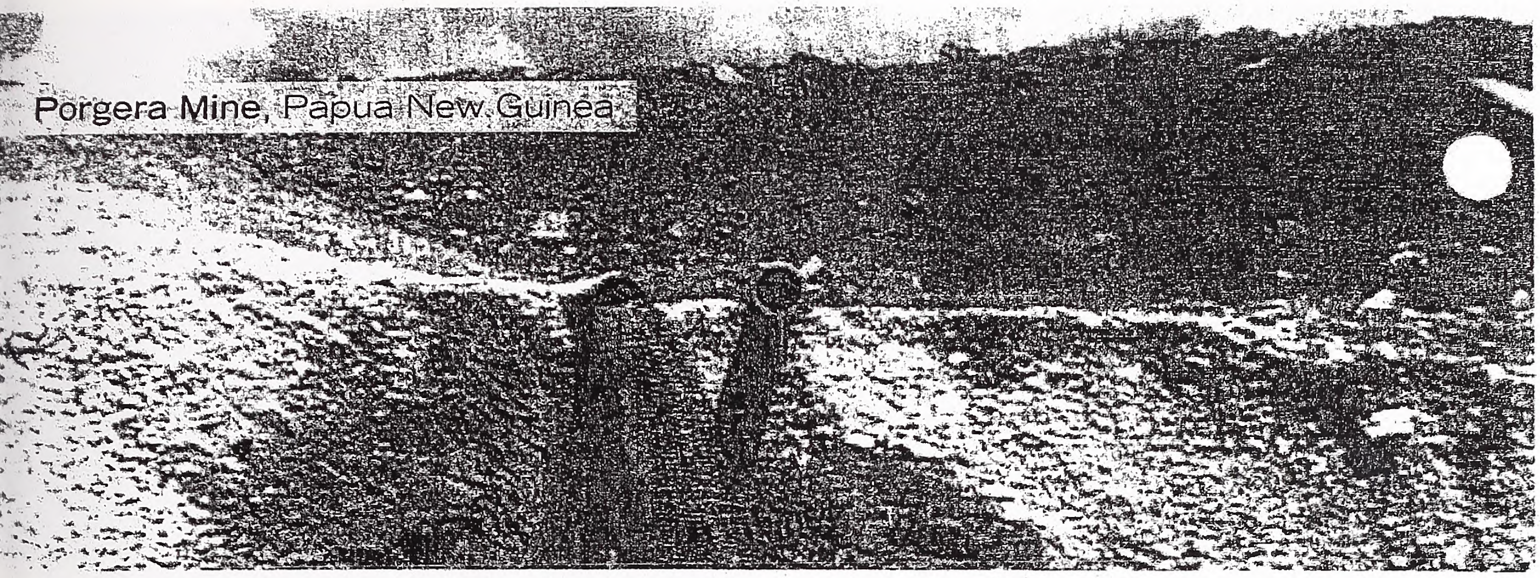
PATTERN OF VIOLATIONS

Barrick Gold, which operates nine mines in Australia, has been accused of environmentally unsound practices, mining-related accidents, and safety violations. For example, in January 2003, a 26-year old woman was killed in a pit-wall collapse at a Barrick mine in Western Australia. More recently a man driving a truck to the Lake Cowal mine, to collect used muriatic acid, hit a tree at Bumbaldry, NSW. Workers for Barrick sub-contractors have also complained of poor employment conditions.

A 2004 Western Australian government's report on the Kalgoorlie Super Pit, a Barrick-Newmont joint venture, found a large area around the Fimiston 1 tailings dam was affected by cyanide and heavy metal contamination, elevated groundwater cyanide levels, and increased salinity. Kalgoorlie Consolidated Gold Mines (KCGM) admitted on July 27, 2005, that the mine's roaster and carbon kilns were emitting five to seven metric tons of mercury per year. In April 2007 the Western Australian authorities fined KCGM $25,000 for sulphur dioxide emissions that affected Coolgardie residents.[48]

Title Photo: Pelicans by the flock hunting through the shallows of Lake Cowal. Lake Cowal is an ephemral lake, it is full an average of seven out of ten years. This area is facing the worst drought in 100 years. Lake Cowal has been substantially dry since October 2001. Source: www.ecopix.net

Below: Lake Cowal supporters listening to Wiradjuri Traditional Owners at the gates of Barrick's mine at Lake Cowal, NSW October 2004. photo: Natalie Lowrey



CASE STUDY:

GOLD MINE TRANSFORMS PACIFIC ISLAND

The Ipili people of Papua New Guinea had the misfortune of living on top of a lot of gold. When mining companies arrived in their region and wanted to make a deal to start a gold mine, the locals thought they could work out an arrangement that would grant them benefits from all of the profits that would be made. Unfortunately, things did not work out the way they hoped.

Landmark deal

The agreement reached between the locals and the company was hailed by the industry as a landmark deal because up to that point, landowners had seldom if ever been involved in negotiations at all. Porgera Joint Venture (PJV) company, the entity that Placer Dome created to run the mine, would pay the Porgeran's through the PNG government for the use of their land, pay dividends to the families of the original landowners based upon how much gold was mined, and would build a school and other buildings for the town.[49]

Landscape eroded

From the beginning, however, there were allegations of dishonesty. People claim that the signers of the contracts were illiterate at the time, and that they were given alcohol during the negotiations.[50] Things got worse when in the early 1990, the most accessible veins of ore were depleted. It was then that the company turned to open pit mining, began blasting away the hills, using cyanide to leach gold and other toxins from the rubble, and dumping the poison waste into the local streams. In fact, whereas in 2000, the Porgera mine produced 6.6 tons of waste per ounce of gold produced[51], in 2006, that figure was up to approximately 97.6 tons of waste per gold ounce.[52]

Although PJV paid villagers to relocate to new houses in the hills above the despoiled valley the homes started sinking into the ground or sliding slowly down the hill as mine debris eroded the landscape. As time passed, the villagers began to measure the deal and their cheap tin houses against the despoiled environment and the wealth the mining company has extracted.

Increasingly the villagers grew to rely on the mine for sustenance, whether through wages or lease payments. Many of them are now "reeling from the impact of a cash-for-land deal that has turned their traditions upside-down and their ancestral home into an industrial moonscape patrolled by guards and police," according to an article by the *Ottawa Citizen*.[53]

Between 8 and 39 people have been killed in fights between company security men and alluvial miners (Placer Gold admitted to eight deaths[54], while ATA puts the number at 39 mine-related deaths[55]). The company's security men are accused of beatings and rapes against the villagers. Many people search for gold in and around the mine, and as the mine itself has grown bigger and bigger, and the local population exploded, clashes have erupted over access to the precious yellow ore.

When would-be gold collectors have approached company property, guards have fired at them in the past, claims the Akali Tange Association (ATA), an organization that advocates against human rights abuses in the area.[56]

Growing inequity and changing social structures exacerbated dissatisfaction between the mining company and the locals. New arrivals seeking work at the mine, who currently account for 40 percent of the 10,000 people living around Porgera, and relatives of landowning families began demanding a share of the monetary compensation from their kin. This phenomenon is perfectly normal among Papua New Guineans who share any fortune, good or bad, with their tribe and extended family. Typically a group of approved elders make a judgment awarding cash to the injured parties who divide it among their relatives.

Workers organize

Stanley Kaka, a 44-year-old former mineworker and union organizer, embodies a living history of the Porgera region. As a child in the 1970s, he and the other village males slept in a longhouse with hammock-bunks lining the walls. Nearby was a similar building for the women and children. "We would stay up late every night", he recounts, "telling stories, talking. In the morning we all rejoined our families and went to work in the gardens. Everyone wore grass loincloths and hunted with bows and spears. And so now we have gone from the Stone Age to the Computer Age in one generation." [57]

In 1989 Kaka moved to Porgera from a nearby village and started working at the mine. He immediately noticed how unfairly the employees were treated. People worked long hours for low wages and were exposed to toxic chemicals, he says. He and other workers formed the Porgera Allied Workers' Union with Kaka as its first president. The union won overtime pay, travel compensation for miners who came from distant townships, and special risk pay for the men who worked in the dangerous tunnels deep under Porgera's hills.

It was during one of the union's actions, a "sitting protest" inside of a tunnel, that the company security men clashed with the miners and angry workers destroyed a digging machine. Mine officials blamed Kaka for starting the trouble and fired him.

"This is my land"

"I told the company that I will be here until you leave this place. This is my land", he said. For the last 16 years he has been "not leading, but advising the young generation, the young people who are coming up and saying this is no good. We should at least get maximum benefit out of our resources that the company's taking out".

Porgera is a town with one of the world's largest gold mines and no paved streets. As helicopters ferry wealth overhead, crews of mud-covered young men with picks and orange plastic vests wedge rocks and gravel into deteriorating dirt roads to counter erosion from frequent rains. The overall sense is of an outside corporation extracting what it can at minimum cost, ready to pack up and clear out when the gold supply runs dry.

Rich resources, poor people

Set in the brilliant South Pacific, Papua New Guinea is rich in resources, in ecology, in languages and cultures – and yet the people are poor.

Back in Porgera, local ATA organizers are now working on ways to hold Barrick accountable for a series of incidents in which mine security forces allegedly injured workers.

The company is trying to negotiate a settlement. PJV's Stephenson told the *Papua New Guinea Post Courier*: "We have reached a stage where we ourselves are also not prepared to accept any more deaths. We need to work together to find solutions". [58]

The men of ATA, however, remain skeptical. "But", said one man, motioning forcefully with his arms, "if nothing is resolved, we will shut down this mine in less than a day. We can do it anytime we want to and we will." The Ipili of Porgera are determined to make sure they are not left with just dirt roads and despoiled hills when the gold finally runs out.

A WOMAN'S PERSPECTIVE:

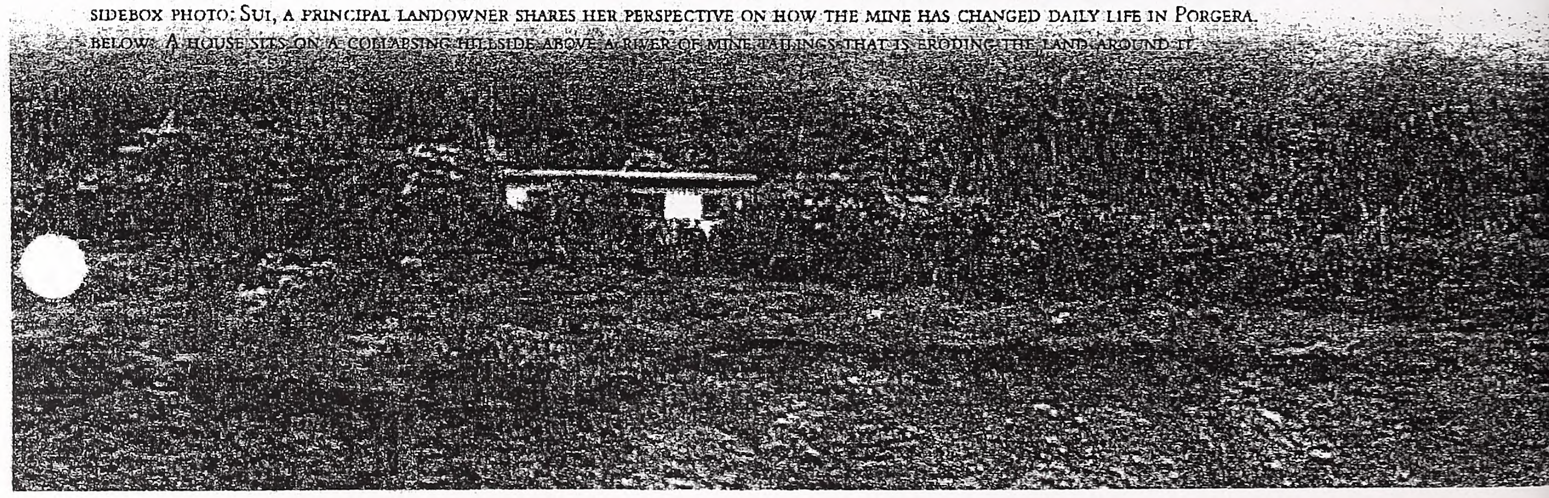
SUI, A PRINCIPAL LANDOWNER

How has the mine changed life?

Now I have more problem and living a harder life. in the olden days I used to good drink fresh clean water with paste now [I am] drinking tessness (sic) water. We used to have good bananas, and now we got bananas that is not sweet, and the bananas are not bearing good fruits and even the covers as well. We used to have good kava in the garden, but under the conditions most kavas have gone, and now one type of kava is in the place.

In the olden days before the mining, all the women were being properly protected and secured by the men through the sub clan. But now when the mine came and all things kind of came apart: tribes not living together, women all scattered over, and they are not well-protected. And now that money is scarce and taken the place some ladies have money... and those that don't have the money they have no place to move to, they've got no money to give to bus drivers, they are not living in good house, they are living in a school settlement out in the bushes, and through that and some ladies are caught into sicknesses like AIDS and it is hopeless now. [59]

TITLE PHOTO: BARRICK DEPOSITS MINE TAILINGS DIRECTLY INTO THE RIVERS. ALL PHOTOS: DAVID MARTINEZ
SIDEBOX PHOTO: SUI, A PRINCIPAL LANDOWNER SHARES HER PERSPECTIVE ON HOW THE MINE HAS CHANGED DAILY LIFE IN PORGERA.
BELOW: A HOUSE SITS ON A COLLAPSING HILLSIDE ABOVE A RIVER OF MINE TAILINGS THAT IS ERODING THE LAND AROUND IT.



CASE STUDY:

MEGA MINING PROJECT ENDANGERS NATURAL AND CULTURAL BALANCE

Pascua Lama-Veladero[60] is a mine project operated by the subsidiaries of the Canadian transnational company Barrick Gold Corporation[61], the Compañía Minera Nevada Ltda. (Chile) and Barrick Exploraciones Argentina S.A. They plan to set up a gold, silver and copper mine in a semi-desert region of the Andean Cordillera, on the Chilean-Argentinean border. This project is located on the source of the Huasco river system on the Chilean side, and of the Cura Valley, on the Argentinean side. In Argentina, the mine lies within the San Guillermo Biosphere Reserve territories (UNESCO, 1981) in the province of San Juan. In Chile, Pascua Lama abuts the southern border of the Atacama Desert, one of driest in the world, and intrudes into ancestral Diaguita indigenous territory.[62]

Pascua Lama-Veladero mining activities endanger the natural and cultural balance of these valleys, affecting around 70,000 people in Chile [63] and 24,000 in Argentina.[64] Pascua Lama mining directly affects mountain glaciers that are essential water sources for these regions and poses a serious threat to biodiversity.[65] The affected region is a habitat for condors, eagles, vicunas and other fauna and flora species.[66]

The area has already experience environmental impacts from the exploration and prospecting phase carried out in the 1990s - a period of multiple free trade agreements that stimulated this kind of project. A report from the Dirección General de Aguas of Chilean Government (the national agency responsible for water management) shows that the activities of this mining project have reduced the volume of glaciers Toro 1, Toro 2 and Esperanza between 50 and 70 percent between 1981 and 2000.[67] The Conconta glacier in Argentina has already been destroyed.[68]

The quality and the availability of an already precarious water supply will be threatened by the use of toxic materials such as cyanide (its use was denounced by the Declaration of Berlin, 2000) and some heavy metals. Mineral extraction methods will cause dust emissions containing particles of lead, arsenic, uranium, chromium, zinc, asbestos, mercury, sulphur, cobalt, manganese, etc.[69] Dust deposits on the surface of glaciers will accelerate the thawing process. Accumulation of toxic material will pollute the soil and the ground water table. In addition, mining operations require a large amount of water--370 liters per second[70]--increasing the pressure on an area traditionally prone to drought. According to current arrangements, Barrick Gold will get this vital resource for free, since this company owns the water rights and can decide how to use them.[71]

Pascua Lama-Veladero disrupts the ecology of the territorial area known for its agricultural and pastoral activities including the production of export grapes, olive oil, brandy, pisco, fruits, vegetables, goat cheese, etc.[72] On the Argentinean side, mining activities will adversely affect the development of tourist activities, including highly valued thermal baths.[73]

Also, territorial and ancestral rights of the indigenous Diaguita community in Chile are being violated despite the law focusing on indigenous rights (Law 19,253 of 1993 on Protection, Promotion and Development of Native Peoples of the Department of Planning and Cooperation). But this law does not adequately ensure the protection of the Diaguita's land and it's water. Corporate interests have even used this law to trespass on indigenous communities rights.[74]

During the time leading up to the construction of the mine, in 1996, Barrick acquired land rights in Chile and proceeded to set up gates blocking public pathways. This blocked shepherds[75] from moving their livestock to traditional mountain grazing grounds. Before the arrival of Barrick, this land was the subject of a legal controversy, with the Diaguita claiming that it had been usurped by a private landowner. Although the case is still in Chilean courts, the Pascua Lama project continues.[76]

Territorial appropriation by Barrick Gold includes the construction of a 6 km tunnel through the Chilean-Argentinean border to allow the transport of resources, machines and various materials needed for mining operations.[77] The tunnel will also provide the means to move mineral products to the Pacific coast where they can enter the international market. The operation of this tunnel does not include a customs system or a border checkpoint, as required by the present local laws.[78]

The Pascua Lama-Veladero project violates the self-determination rights of the local population. This mining project has set up shop through a campaign of charm and pressure on local and national authorities and on the local population. Barrick displays a public image of "a socially responsible mining corporation," promising to contribute to the progress of the region, pledging large amounts of money, offering gifts, promising job openings and assuring that the environment will be rigorously protected by it's "clean" and scientifically controlled mining procedures. However, the history of this company reveals these promises as illusory.[79]

Working conditions at the mine are disturbingly precarious. More than 50 miners have already died on the job and Barrick has released no information about the circumstances related to these fatal accidents.[80] The work is performed at very high altitudes (5,000 m above sea level) and safety standards and appropriate physical training are insufficient. Despite complaints by local residents, there are no controls to monitor and regulate the movement of many vehicles, trucks, and large machines that pose risks to the local communities living near access routes to the mine.[81]

The mining company will generate enormous profits from this project, thanks, in part, to the low cost of the royalties (5 percent in the case of Chile,[82] 3 percent in Argentina[83]). The Pascua Lama project is only the beginning of a series of new mining initiatives born with the Mining Integration Treaty (Tratado sobre integración y complementación minera) between Argentina and Chile, signed in 1997, promoted by Barrick Gold Corporation.[84]

The commercial operations of Barrick Gold, as well as those of other big transnational corporations, are negotiated under civic-juridical systems of governments that appear to be democratic and representative, but in fact are manipulated by huge economic national and international interests. These economics interests are dictating a status quo that allows them to continue to increase their privileges, despite harm to the common good.[85] Opposition to the Pascua Lama project consists of a broad movement of farmers, aboriginal people, church members, district communities, young people, along with organizations dedicated to protecting and researching environmental, indigenous, and human rights. This movement has exhausted the few legal and judicial resources that the Chilean, Argentinean, and international systems offer.[86] The resistance movement to the Pascua Lama -Veladero project emerged after the first study on environmental impact evaluation in Chile in 2001, bringing to light the fact that Barrick failed to mention the existence of glaciers at the site of the proposed open pit mining project. The project has since been modified with Barrick planning to locate the open-pit mine near the glaciers Toro 1, Toro 2 and Esperanzat.[87]

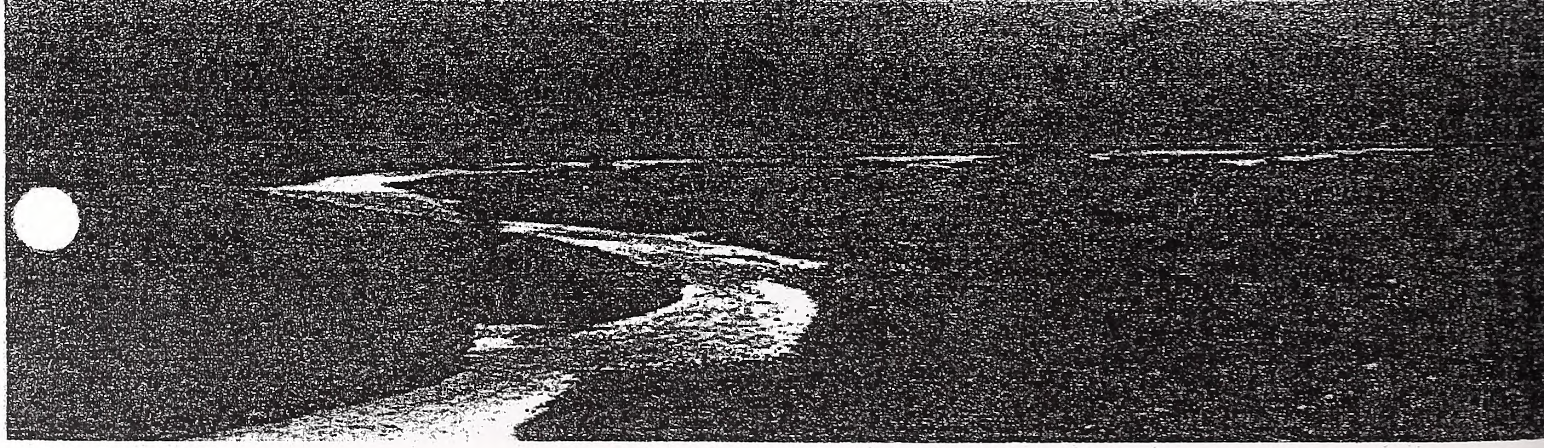
The Pascua Lama-Veladero project was approved in 2006[89] by the Chilean and Argentinean governments and construction of the mine is expected to begin in September 2007.[90]

Despite the fact that the Pascua Lama-Veladero project was approved on June 16th, 2006 by CONAMA (the Chilean National Environment Commission), the movement to stop Pascua Lama is still finding ways to denounce the impacts of the project and to demand that it be stopped. Here are some of those activities:

- *Denunciation before the Inter-American Commission of Human Rights (January 2007);*
- *Denunciations before the Seventh Session of the Commission of Environmental Co-operation Chile-Canada (January 2007);*
- *Indictment of Barrick in the Popular Court at the II Social Forum in Chile (November 2006);*
- *Letter from the Diaguita Huasco Altina community's chief to the general manager of Barrick Gold Corporation (November 2006);*
- *Written and oral submissions to the National Roundtables on Corporate Social Responsibility, organized by the Government of Canada (October and November 2006);*
- *Letter from the community Diaguita Huascoaltina to the President of Chile, Michelle Bachelet (August 2006);*
- *Declaration of religious members in defense of the Huasco Valley (August 2006)*

Title Photo: Camino Minero is the widest street in all of the province of San Juan, paid for by public funds and only mining trucks can use it, and the occasional wood gatherer. It leads to Pascua Lama / Veladero. photo: David Modersbach

Below: Photo of Rio Jachal. The Jachal river which supplies all drinking water to the city and fertile valley of Jachal, San Juan [illegible] of Barrick's Veladero mine. photo: David Modersbach



ON-GOING LITIGATION AGAIN

UNITED STATES

Wilcox Complaint

On September 8, 2004, current or former residents of a rural area near the former Grants Uranium Mill filed a complaint against two Barrick subsidiaries: Homestake Mining Company of California and Homestake Mining Company. The 26 plaintiffs allege that they have suffered a "variety of physical, emotional, and financial injuries" as a result of exposure to radioactive and other hazardous substances. The complaint, filed in the U.S. District Court for the District of New Mexico seeks an unspecified amount of damages.[91] One year later, results of groundwater sampling by the Grants Uranium Mine tested by the New Mexico Environment Department and U.S. Environmental Protection Agency show contaminants in 33 of 34 residential wells sampled, including elevated levels of uranium in 21 wells.[92]

Western Shoshone

Mt. Tenabo and Horse Canyon are extremely important spiritual and cultural sites for the Western Shoshone indigenous peoples in Nevada. Nonetheless, Cortez Gold Mine, of which Barrick Gold is a majority owner, is expanding mining expansion in this area. The Western Shoshone and supporter organizations have fought against mining for several decades, first opposing Oro Nevada, then Placer Dome, and now Barrick Gold. In 2005 after numerous cultural resource studies, shareholder actions, and administrative proceedings, the Te-Moak Tribe, the Western Shoshone Defense Project, and Great Basin Mine Watch filed a lawsuit against the U.S. Bureau of Land Management. Then majority owner Placer Dome, filed a motion to intervene, claiming interest in the area and charging that the Western Shoshone did not have significant interest to proceed in the litigation. Barrick Gold has not retreated from the position of its predecessor and is now a party to the lawsuit.

On April 16, 2007, the United States federal court in Reno heard arguments in a case against the Bureau of Land Management's approval of Cortez Gold Mines' gold mining exploration proposal on and around Mt. Tenabo and Horse Canyon, in a room filled with tribe supporters. The defendants are the BLM and Cortez Gold Mines, Inc.

The plaintiffs' case rests on three main issues: 1) BLM violated the National Historic Preservation Act when it failed to adequately consult with the Western Shoshone on the mining exploration project. BLM also failed to adequately protect Western Shoshone cultural and religious uses of and resources in these areas; 2) BLM violated the National Environmental Policy Act (NEPA) when it failed to review the impacts of the massive Pediment/Cortez Hills mine project that Cortez Gold Mines has proposed in the same area; and 3) BLM violated the Federal Land Policy and Management Act (and also NEPA) when it approved the mining exploration without knowing the actual location of roads, drill sites, etc.; it also failed to adequately protect Western Shoshone heritage resources.[93]

SOUTH AMERICA

Chilean Rodolfo Villar sues over Pascua Lama properties

When Rodolfo Villar sold 20,000 acres to Barrick Gold for its Pascua Lama gold mining project, the mineral speculator signed a contract that he thought would pay him $1 million. Instead, the contract gave him only $19, and a fine-print stipulation that if he tried to obtain rights to any other lands in the surrounding area, he would face a $95,000 fine.[94]

Aided by legal team of 30, including some of Chile's most prominent lawyers, Villar sued Barrick and won. Rather than getting the million dollars, he got his land back and is now asking $300 million for it. "Literally, we are sitting on a gold mine," remarked one of his lawyers to the *Washington Post*. Barrick is appealing the case.[95]

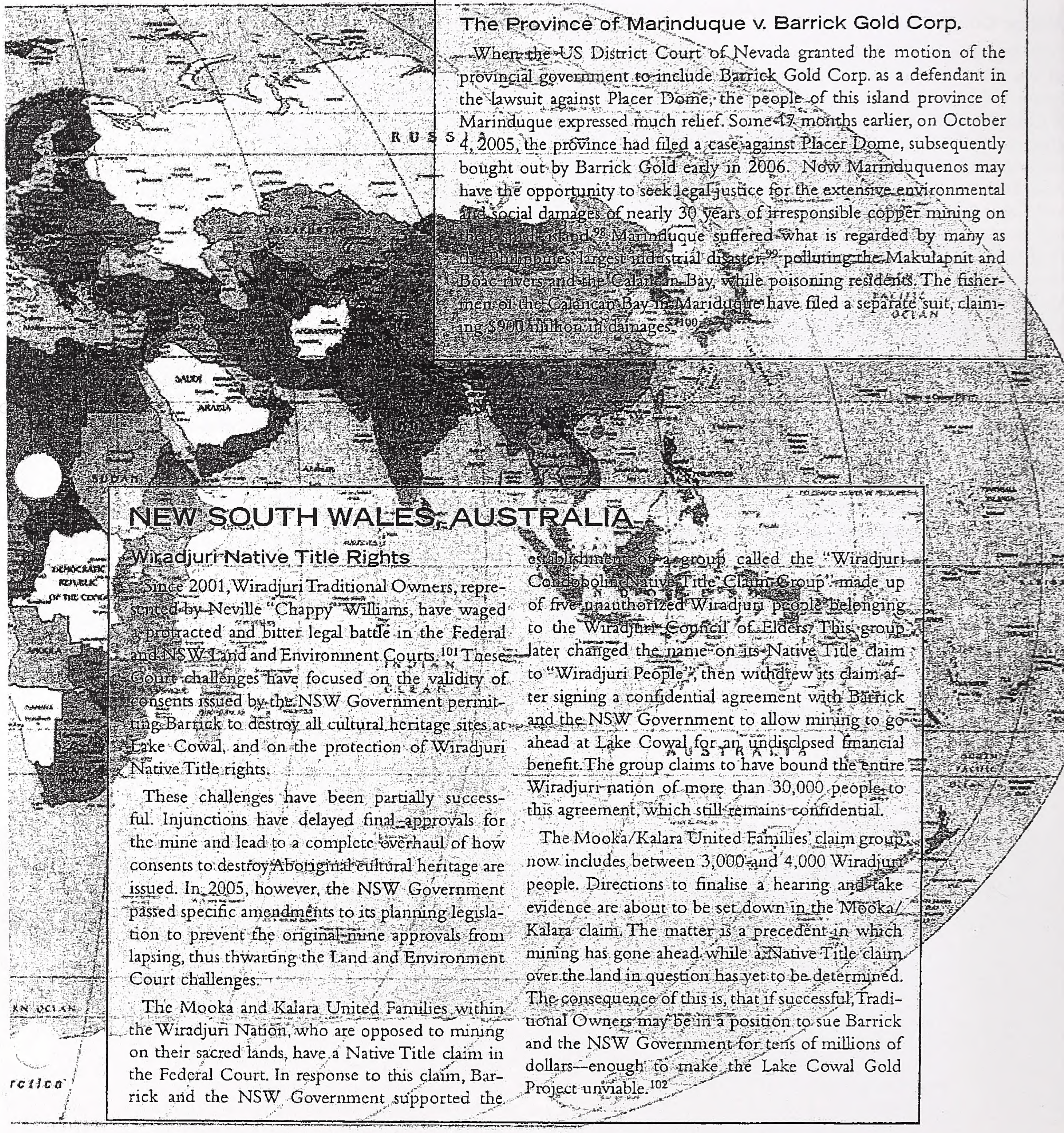
Villaverde family of Argentina is perusing similar litigation: The family has land claims to an area of a proposed mine, but refuses to sell cheap.[96]

Chilean traditional owners, the Huascoaltinos sue over land claims

An ancestral indigenous group from northern Chile is accusing Barrick of illegally acquiring land near the mining company's proposed Pascua Lama project. The Diaguita indigenous communities say that historical documents prove that the disputed land is part of their ancestral territory. They filed a lawsuit against the company in 2001, charging that the single group member who signed the contract was not legally entitled to make the deal.

Additionally, on July 25, 2005, the Chilean Consumers' Organization filed a complaint with the Organization of American States (OAS). It alleges that the Pascua Lama project poses a grave risk to the subsistence rights of the Diaguita indigenous communities in the area, and that the Chilean government would be breaking its international commitments if it approves the project. Specifically, the United Nations International Covenant on Economic, Social and Cultural Rights (ICESCR) and the International Covenant on Civil and Political Rights commit the Chilean government to giving "special protection" to Diaguitas water rights.[97]

IST BARRICK



PHILIPPINES

The Province of Marinduque v. Barrick Gold Corp.

When the US District Court of Nevada granted the motion of the provincial government to include Barrick Gold Corp. as a defendant in the lawsuit against Placer Dome, the people of this island province of Marinduque expressed much relief. Some 17 months earlier, on October 4, 2005, the province had filed a case against Placer Dome, subsequently bought out by Barrick Gold early in 2006. Now Marinduquenos may have the opportunity to seek legal justice for the extensive environmental and social damages of nearly 30 years of irresponsible copper mining on their small island.[98] Marinduque suffered what is regarded by many as the Philippines' largest industrial disaster,[99] polluting the Makulapnit and Boac rivers and the Calancan Bay, while poisoning residents. The fishermen of the Calancan Bay in Mariduque have filed a separate suit, claiming $900 million in damages.[100]

NEW SOUTH WALES, AUSTRALIA

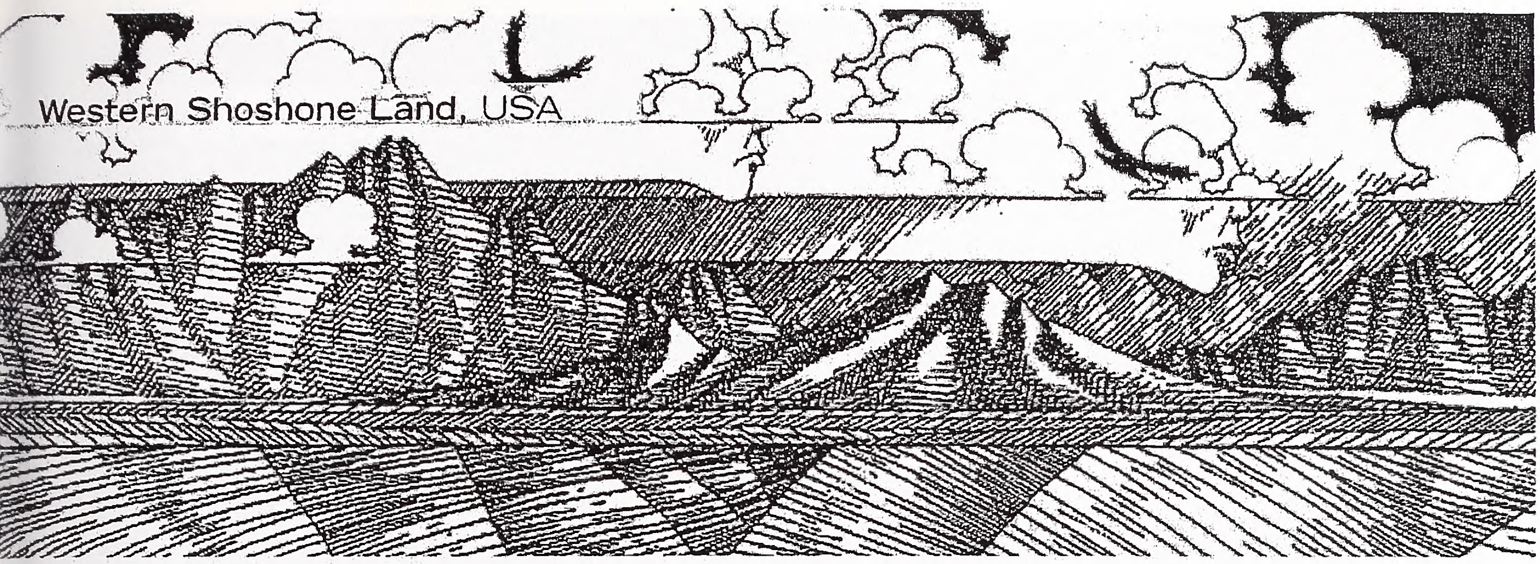
Wiradjuri Native Title Rights

Since 2001, Wiradjuri Traditional Owners, represented by Neville "Chappy" Williams, have waged a protracted and bitter legal battle in the Federal and NSW Land and Environment Courts.[101] These Court challenges have focused on the validity of consents issued by the NSW Government permitting Barrick to destroy all cultural heritage sites at Lake Cowal, and on the protection of Wiradjuri Native Title rights.

These challenges have been partially successful. Injunctions have delayed final approvals for the mine and lead to a complete overhaul of how consents to destroy Aboriginal cultural heritage are issued. In 2005, however, the NSW Government passed specific amendments to its planning legislation to prevent the original mine approvals from lapsing, thus thwarting the Land and Environment Court challenges.

The Mooka and Kalara United Families within the Wiradjuri Nation, who are opposed to mining on their sacred lands, have a Native Title claim in the Federal Court. In response to this claim, Barrick and the NSW Government supported the establishment of a group called the "Wiradjuri Condobolin Native Title Claim Group" made up of five unauthorized Wiradjuri people belonging to the Wiradjuri Council of Elders. This group later changed the name on its Native Title claim to "Wiradjuri People", then withdrew its claim after signing a confidential agreement with Barrick and the NSW Government to allow mining to go ahead at Lake Cowal for an undisclosed financial benefit. The group claims to have bound the entire Wiradjuri nation of more than 30,000 people to this agreement, which still remains confidential.

The Mooka/Kalara United Families' claim group now includes between 3,000 and 4,000 Wiradjuri people. Directions to finalise a hearing and take evidence are about to be set down in the Mooka/Kalara claim. The matter is a precedent in which mining has gone ahead while a Native Title claim over the land in question has yet to be determined. The consequence of this is, that if successful, Traditional Owners may be in a position to sue Barrick and the NSW Government for tens of millions of dollars—enough to make the Lake Cowal Gold Project unviable.[102]



CASE STUDY:

MINING ON SPIRITUAL GROUNDS

The Western Shoshone peoples in the United States are engaged in one of the world's best-known and longest indigenous land rights struggles. For several decades, the Shoshone people have voiced serious concerns that environmental damage resulting from the cumulative effects of the mining activities will severely affect, if not outright destroy, Western Shoshone land, resources, and customs.

Creation stories teach that the Newe, the people, are responsible for the earth, which is a female living being. Carrie Dann, Western Shoshone grandmother said:

We were taught that we were placed here as caretakers of the lands, the animals, all the living things – those things that cannot speak for themselves in this human language. We, the two-legged ones, were placed here with that responsibility. We see the four most sacred things as the land, the air, the water and the sun (l.a.w.s.). Without any one of these things there would be no life. This is our religion – our spirituality – and defines who we are as a people.

In the 1863 Treaty of Peace and Friendship (Treaty of Ruby Valley) with the United States, the Western Shoshone granted the United States access across their lands and permission to undertake certain activities.[103] In exchange, the United States recognized Western Shoshone land boundaries and agreed to pay compensation.[104]

The original conditions of the treaty still hold and the Western Shoshone continue to occupy and use their ancestral lands. Now, however, Washington is undermining those traditional and legal rights and claiming approximatey 90 percent of the land base as federal or "public" lands. It is relying on stipulated agency findings of "gradual encroachment" – a procedure that the Inter-American Commission on Human Rights[105] called an "illegitimate" means of claiming title.

In 2002, the Inter-American Commission issued a final report finding the United States in violation of Western Shoshone rights to equality before the law, due process, and property.[106] Rather than abide by this decision, the U.S. conducted an armed seizure of over 400 Shoshone horses. The United States has been in defiance of not only the findings and recommendations of the Inter-American Commission, but also the recommendations and Final Decision of the United Nations Committee on the Elimination of Racial Discriminatinon (CERD).[107] CERD noted particular concern regarding:

a) ... legislative efforts to privatize Western Shoshone ancestral lands for transfer to multinational extractive industries and energy developers.

b) Information according to which destructive activities are conducted and/or planned on areas of spiritual and cultural significance to the Western Shoshone peoples, who are denied access to, and use of, such areas. It notes in particular ... the alleged use of explosives and open pit gold mining activities on Mount Tenabo and Horse Canyon.

c) The conduct and/or planning of all such activities without consultation with and despite protests of the Western Shoshone peoples..."[108]

CERD further ordered the U.S. to "freeze" and "desist" from all activities planned or conducted on the ancestral lands of Western Shoshone, particularly in relation to their natural resources.[109] Barrick Gold was immediately notified of this decision.

The Western Shoshone have brought the issue to international attention as partners in the No Dirty Gold Campaign, a global campaign to educate consumer about the effects of mining. The campaign has developed strong networks among indigenous communities fighting companies including Barrick.

Barrick is the primary actor in the Mount Tenabo and Horse Canyon areas. The Toronto-based company is the majority owner of Cortez Gold Mine, the entity submitting exploration and mining expansion proposals. The mining activities by Cortez Gold Mine are being pushed forward without the free, prior and informed consent of the Western Shoshone nor adequate consideration of the resulting spiritual, cultural and environmental harms. Because of the increased activity in this area, on May

9, 2005, the Western Shoshone Defense Project, the Te-Moak Tribe of Western Shoshone, and Great Basin Mine Watch filed a lawsuit against the U.S. Bureau of Land Management (BLM) challenging the approval of mining activities on Mount Tenabo and Horse Canyon.[110] *(see on-going litigation: page 12-13)*

Operations around Mount Tenabo and Horse Canyon are threatening burial and other historical and spiritual sites as well as despoiling land used for gathering medicinal and food plants, and for hunting. The United States recently recognized some of these sites for listing on the U.S. National Register of Historic Places as Properties of Cultural and Religious Importance.

Since the filing of the lawsuit, the U.S. Department of Interior, BLM, has announced plans by Cortez Gold Mines to further expand its open–pit gold mining and processing operation in the Cortez Hills Expansion Project.[111] According to the state's public notice, the "disturbance area" associated with this project is 15,242 acres of Western Shoshone traditional land.[112] The expansion would entail the destruction of 5,000 acres of Pinyon Forest, a staple Western Shoshone food source; a new open-pit cyanide heap leach mine on the Southern flank of the mountain; new heap leach pads; and increased dewatering and underground detonations. Barrick has also proposed an expansion through its Underground Project that digs into the east flank of Tenabo wrapping around to the southwest portion of the mountain.

The rate at which the Betze mine is dewatering the area – upwards of 70,000 gallons per minute – could deplete the water source and affect springs used for healing and prayer rituals.

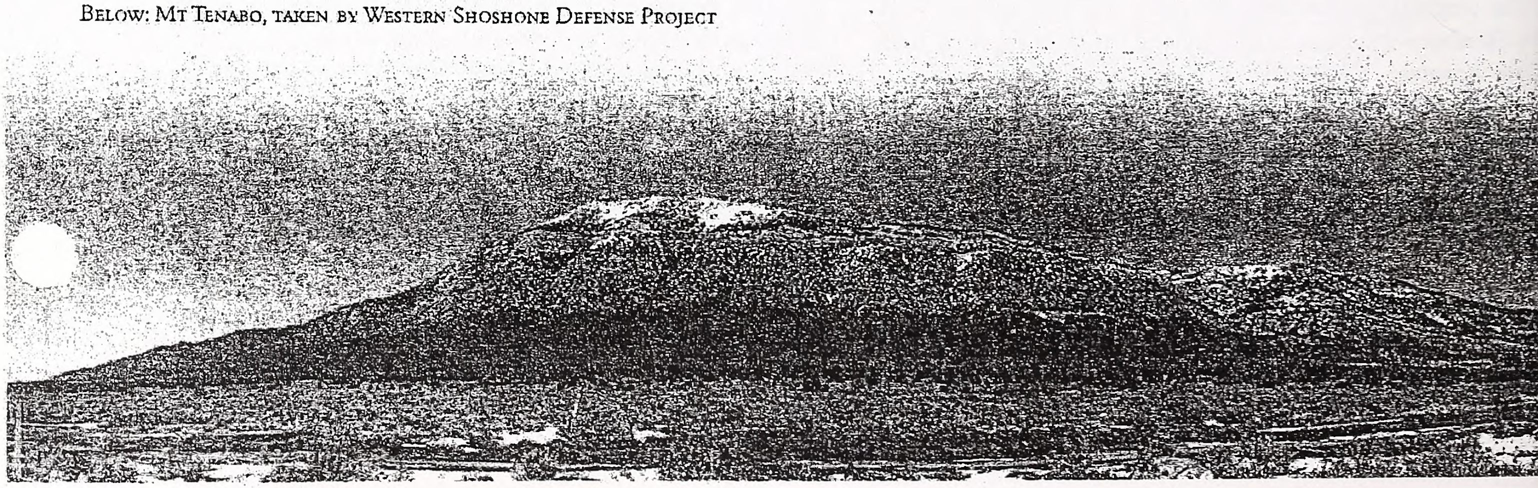
In addition to the immediate threat to the Mount Tenabo and Horse Canyon area from the Cortez mine, Barrick Gold operations are also threatening the current spiritual and ceremonial area of Rock Creek. The rate at which the Betze mine is dewatering the area – upwards of 70,000 gallons per minute–[113] could deplete the water source and affect springs used for healing and prayer rituals.

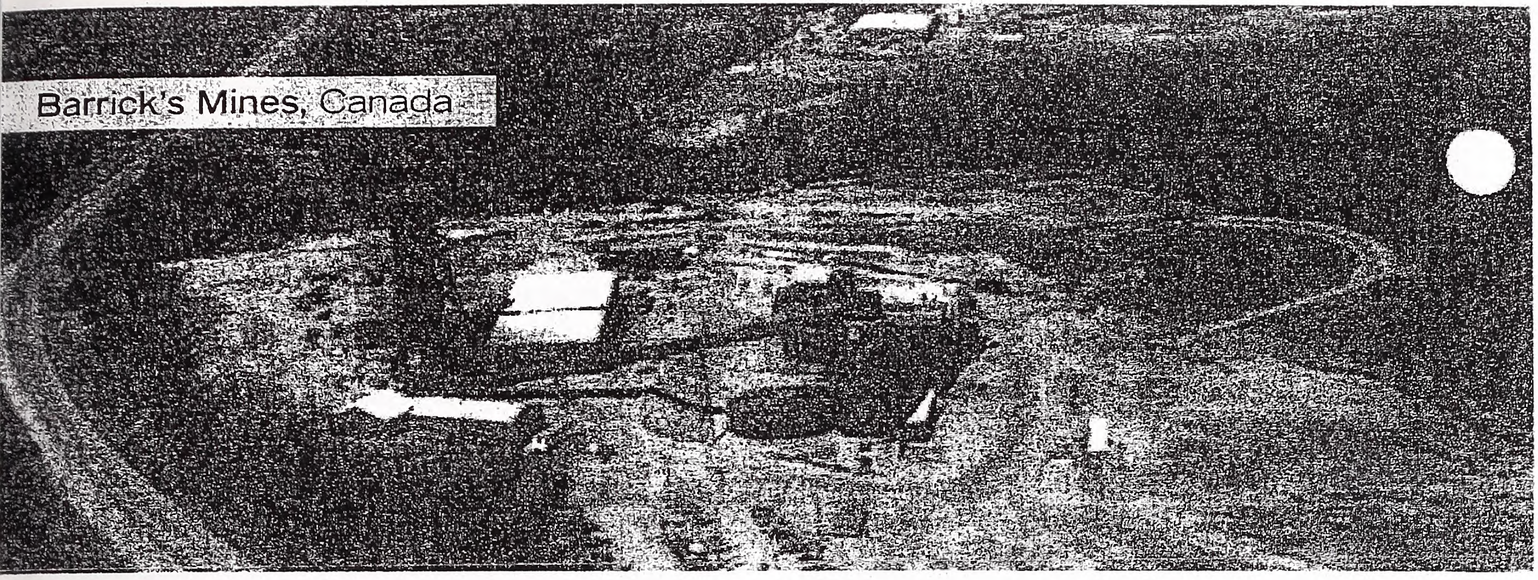
The damage is not confined to Mount Tenabo/Horse Canyon and Rock Creek. Mining activities on Western Shoshone land present a devastating picture of massive dewatering and dangerously high levels of mercury and other toxins.[114] In clear violation of CERD's recommendation to desist from such activities, Barrick's joint venture Round Mountain Gold Corporation recently announced plans to expand its existing boundary by 3,122 acres and double production capacity from 11,000 to 22,000 tons per day.[115] Barrick's Bald Mountain operation announced expansion plans of over 3,500 acres in an area used and occupied by Western Shoshone extended family at the Odger's Ranch.

The mining expansions will mean that Western Shoshone peoples, who already live in the state with the country's highest levels of mercury pollution, will be further exposed to toxins.[116] The Environmental Protection Agency reports that northern Nevada gold mines release more than 4,600 pounds of mercury into the air each year. A recent independent study found mercury concentrations in fish collected from Wild Horse Reservoir at levels the U.S. Environmental Protection Agency considers a public health risk.[117] A finding of half that level of contamination spurred Idaho to issue a fish consumption advisory warning pregnant women and children under 12 not to eating fish from the reservoir.[118]

In response to concerns raised at Placer Dome's 2005 annual general meeting, the company initiated quarterly "dialogues" with the Western Shoshone to reportedly to address cultural and environmental concerns and human rights issues around the Mount Tenabo area and other areas. However, the dialogue sessions facilitated by a Barrick contractor have not allowed for these discussions to take place. Instead, the dialogues have been used by Barrick to solicit small "community benefits" to individual Shoshone communities and to claim that the participation of Shoshone somehow equates to consent for ongoing operations. Concerns have been repeatedly raised to Barrick and in their most recent response, President Greg Lang openly employed a divide and conquer tactic by claiming that the use of litigation to protect the Mount Tenabo area was expending funds that the Company could otherwise be using to "benefit" Western Shoshone. By this manipulation of the "dialogue" process, Barrick is in fact creating further divisions between Shoshone individuals and communities, exacerbating an already bad situation.

Title photo: art by Shoshone artist Jack Mallot
Below: Mt Tenabo, taken by Western Shoshone Defense Project





BARRICK'S LEGACY:

MAKING A MESS, LEAVING THE BILL

Despite the fact that Barrick is a Canadian company, it only has two operating projects in Canada: Eskay Creek in northern British Columbia, and the Hemlo Joint Venture on the north shore of Lake Superior in Ontario. It also has a number of closed mines in Canada, such as Renabie, and Golden Patricia.

The environmental impact of these mines is difficult to assess because the laws vary from province to province and regulation is lax. Regulators often depend on self-reporting and self-monitoring by the mining companies themselves, so there is little publicly available information at either the provincial or federal level.

Renabie Mine (1947-1991)

The Renabie Mine is on land that straddles the Arctic and Superior watersheds. It is on the traditional territory of the Missanabie Cree First Nation, who are still fighting for legal recognition of their indigenous land rights.

Renabie was the first gold mine to open after the Second World War (gold mines were required to close during the war because miners were diverted to excavate metals that were more important for war-related production). The mine operated until 1991. Once the ore was depleted, the mine shut down. The present population that lives at the site of the former mine totals about 40.[119]

Even today the surface water flowing from the property contains elevated levels of zinc, cobalt, iron and copper. In 1995, company reports declared that reclamation work had been completed, except for some re-vegetation of the tailings areas. But in 1998 sink holes began to appear on the site, and in 1999 part of the underground mine collapsed, creating a gaping hole through to the underground workings.[120]

Even today the surface water flowing from the property contains elevated levels of zinc, cobalt, iron and copper. In 1995, [Barrick's] reports declared that reclamation work had been completed, except for some re-vegetation of the tailings areas. But in 1998 sink holes began to appear on the site, and in 1999 part of the underground mine collapsed, creating a gaping hole through to the underground workings.

Barrick has been trying to get the provincial government to assume responsibility for the mine following the closure and has applied for an "exit ticket" in return for a fee of $102,290. (The system of "exit tickets" which allow companies to walk away from future liability after paying a fee, was created in Ontario after extensive lobbying by the mining industry in the mid-1990s.)[121]

Golden Patricia Mine (1988-1997)

The Golden Patricia Mine in northern Ontario opened in 1988. The mine was on the traditional territory of a number of First Nations indigenous peoples which were organized into the Windigo First Nations Tribal Council. The council signed an agreement in 1988 with the mining company for environmental protection, jobs and other benefits and renewed it three years later.

Barrick bought the mine from Lac Minerals in 1995. Two years later, the ore at Golden Patricia was completely depleted. The Windigo First Nations then discovered that neither Lac Minerals nor Barrick had fulfilled the agreement that they had signed. [122]

A study by Alan Grant, a law professor at York University, in 1997, paints a dismal picture. There was a clause in the agreement that stated that the parties will "leave the land in as good a condition as regards traditional harvesting pursuits upon completion of the Project as it was before the Project began." Yet the tailings area and waste rock piles are now expected to be toxic in perpetuity. The agreement provided for training and employment, but minimal training was provided. There were no opportunities the indigenous peoples to provide contracted services to the mine and few Windigo members worked at the mine. The council failed to come to any agreement with Barrick about compensation at closure.[123]

Hemlo Gold Camp (1985-

The Hemlo Gold Camp is located on the north shore of Lake Superior near Manitouwadge. In 2001, when Barrick Gold bought Homestake mining company, it acquired a joint venture with Teck-Cominco for two mines – David Bell and Williams – in the Hemlo Gold Camp, The third mine – Golden Giant – is owned by Newmont.

Workers at the mines have reported numerous cases of lung ailments at these mines, including some cases of silicosis and sarcoidosis. The company has fought worker compensation claims for these ailments ferociously.[124]

The First Nations indigenous community that lives downstream from the mine are the Pic River peoples. In 2000, the community reported having to replace their water treatment plant in order to remove cyanide from their drinking water.[125]

According to Northwatch, an NGO in northern Ontario, who reviewed the company closure plans, at the Hemlo mines, estimated closure costs and associated financial securities posted by the mining companies, are much lower than real costs are likely to be, as the closure plans for the mines do not include appropriate disposal or treatment of massive piles of acid generating/leachate toxic waste rock, nor do they evaluate the risk of groundwater contamination to the area through seeps from the tailings areas and underground workings.[126]

The closure plans for the mines do not include appropriate disposal or treatment of massive piles of acid generating/leachate toxic waste rock, nor do they evaluate the risk of groundwater contamination to the area through seeps from the tailings areas and underground workings.

The Eskay Creek Mine (1995-2008)

The Eskay Creek Mine is in the headwaters of the Unuk River in British Columbia the traditional territory of the Tahltan First Nation. Barrick purchased the mine in 2001 from Homestake. It opened in 1995 and will have depleted mineable ore by 2008.

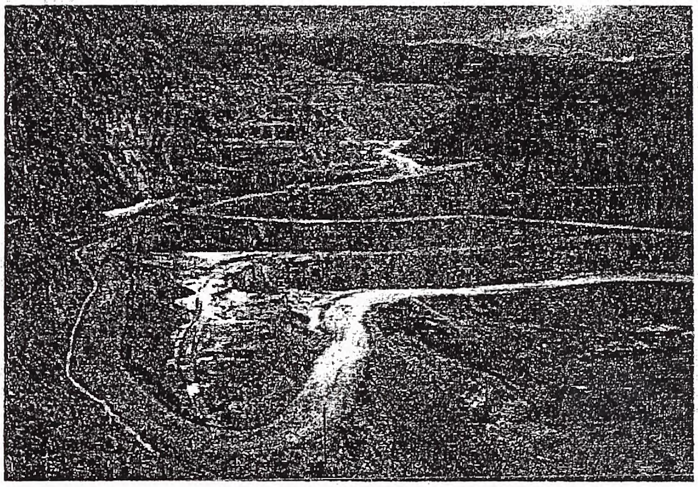
This mine has turned two lakes into tailings impoundments and waste rock dumps: Tom MacKay and Albino Lakes. (This is legal in Canada but severely restricted in other countries like the U.S.)

MiningWatch Canada has expressed increasing concerns about the long term monitoring of the lakes that have been turned into tailings impoundment areas, as there are very high concentrations of antimony, arsenic and mercury contained in the ore.[127] Unfortunately there is no publicly available data on this as there are no right to know laws in Canada that govern the disposal of toxics to waste rock piles and tailings impoundments. All monitoring on effluents is done by the company itself. Since Barrick's take-over of the mine, the company has rarely reported exceeding government water quality standards.[128]

Title photo: Aereal photo of the three mines in the Hemlo Camp: David Bell (front), Hemlo Gold and Williams (rear). photo: Teck Corp Mine
Below: Headframe and stockpile dome with reflection in lake Williams Mine, Hemlo Gold Field photo: Tech Corp Mine

PLACER'S LEGACY:

BARRICK FIGHTS RESPONSIBILITY AND LETS MARINDUQUENOS SUFFER



In the Spring of 2006, when Barrick Gold took over Placer Dome, Inc. it inherited a law suit initiated by provincial authorities on the Philippine island of Marinduque.[129] The suit, filed on October 4, 2005 in a Nevada court, charged that 27 years of irresponsible mining by Placer Dome (1969-1996) had caused immense damage to the island of Marinduque and its people. Placer Dome was 39.9 percent owner of the Marcopper Mining Corporation and managed the two Marcopper copper mines that destroyed one bay and two major river systems on the island of Marinduque.[130] Rather than settle the case, compensating Marinduquenos for lost livelihood and funding efforts to rehabilitate the damaged eco-systems, Barrick is waging an expensive and lengthy legal battle to avoid responsibility.

The now abandoned Marcopper mines and waste dumps sit in the Province of Marinduque, a small heart-shaped island near the middle of the Philippine archipelago, where they continue to contaminate the soil, air and water of the island. Most of the island's 200,000 citizens are fishers and farmers, and many rely for their daily food on what they can harvest from their rivers, sea, and land.

Nearly three decades of Placer Dome's management of the Marcopper mines created one mining-related environmental disaster after another.[131]

Calancan Bay – Since 1975 the food security and health of 12 fishing villages around the bay has been severely affected by mining activities. For 16 years, from 1975 to 1991, Placer Dome oversaw the surface disposal of more than 200 million tons of mine tailings directly into the shallow waters of Calancan Bay. The dumping covered corals, seagrasses and the bottom of the bay with 80 square kilometers of tailings. A large portion of the waste – exposed in a tailings causeway in the bay and by low tides – regularly blows into nearby villages. The tailings also leach metals into the bay and are suspected of causing lead poisoning in local children. In 1998, the Philippine Government declared a state of calamity for health reasons for Calancan Bay villages because of lead contamination.

Mogpog River - In 1991, Marcopper built an earthen dam in the mountainous headwaters of the Mogpog River to keep silt from a waste dump for the new San Antonio mine, from flowing into the river. The townspeople of Mogpog had vigorously opposed the dam project, fearing impacts on the river they use for food, for water for themselves and their animals, and for washing. In 1993, when the dam burst, flooding destroyed houses, water buffalo and other livestock, and crops. Two children were swept to their deaths. Marcopper's resident manager, Placer Dome's Steve Reid, denied responsibility, blaming unusually heavy rainfall from a typhoon.[132] The Mogpog River remains heavily contaminated with acid and metals from mine waste that continues to seep through the faulty dam.

The Boac River Tailings Spill Disaster of 1996

On March 24, 1996, another massive tailings spill at the Marcopper Mine filled the 26-kilometer-long Boac River on Marinduque with 3-4 million tons of metal-enriched and acid-generating tailings. The spill happened when a badly sealed drainage tunnel at the base of the Tapian Pit burst. The mined-out pit, high in the central mountains of the island, had been used since 1992 as to store tailings from the adjacent San Antonio mine. An investigative team from the United Nations visited the island shortly after the tailings spill and noted: "it is evident that environmental management was not a high priority for Marcopper." [133]

Placer Cuts and Runs

Following the Boac River disaster, Placer Dome promised to plug the tunnel, clean up the river and the seashore, and compensate the affected people. But in 1997, Placer Dome divested from Marcopper through a wholly owned Cayman Island holding company called MR Holdings. In 2001, Placer Dome left the Philippines and left the people of Marinduque with heavily polluted ecosystems.

TITLE PHOTO: MARCOPPER MINE, MARINDUQUE. BELOW: TAILING PIPES. PHOTOS OF MARINDUQUE: CATHERINE COUMANS

COMMUNITY VICTORY:

FAMATINA SAYS **NO** TO BARRICK GOLD

This year, in the Argentine province of La Rioja, a small group of dedicated neighbors took on Barrick Gold, forcing it to suspend operations on the Famatina range. Their efforts led as well to the ouster of a corrupt pro-mining provincial governor closely tied to Barrick Gold. The activists were fighting to save their mountain range from open-pit mining exploitation.

In early 2006, Barrick Gold had announced a new gold mining project high on Mt. Famatina in the province of La Rioja. The provincial governor, Ángel Maza, was the mining firm's key ally and a supporter of the neoliberal reforms of the 1990s. He and other officials worked alongside former President Carlos Menem, mining companies, and international finance organizations to privately rewrite the country's mining codes, thereby handing transnational mining companies incentives, tax breaks, legal protection, and environmental impunity for their extractive projects.[136]

While he was supporting these policies, Maza became co-owner of the YAMIRI, a mineral exploration and development company, and the mining concessions on Mt. Famatina. He would later pass that property, which had been state-owned, to Barrick Gold.[137]

When Barrick SUVs began to ply the dusty roads of La Rioja, community members grew nervous. A group of four women met in the town of Famatina in March 2006 and formed the "Self-Organized (Autoconvocados) Neighbors of Famatina for Life." They opted for "horizontal" grassroots organizing with shared decision-making, a structure that had been used effectively in many community struggles in Argentina. Soon a series of smaller, inclusive groups sprang up in towns and villages around Mt. Famatina. Autoconvocados from Famatina, Chilecito, Pihuil, Chañarmuyo, Los Sauces and others villages joined forces, putting politics aside and concentrating on the important issues at hand: learning about and spreading the word on the environmental, social, cultural and economic consequences of open-pit mining.[138]

Assembly of Mothers Against Mining in Jáchal, San Juan are fighting for clean water for their children and exposing the corrupt politicians responsible for mining contamination. photo: David Modersbach

Word was passed through community meetings, local newspapers, flyers, tabling, and town hall meetings. Residents gathered with agricultural producers, tourism guides, teachers, and local political officials to talk about mining threats to the delicate glacier systems. They discussed sustainable development and promoting the health of Famatina. These producers, teachers, and workers met in turn with their organizations and took their message to the capital of La Rioja: "If the mines are built, we cannot produce, and what little we do produce will be contaminated and we will not be able to sell it."

Legislation to Ban Open-Pit Mining

It was not long before allegations of corruption surfaced. Vice Governor Beder Herrera, in abrupt change of heart, introduced a bill in the provincial legislature to prohibit open-pit metals mining in the province. Approved by the legislature, it called for a binding public referendum on the question of open-pit mining to be held on July 29, 2007.

The autoconvocados, emboldened but mistrustful of the entire political process, decided to blockade the mining road at Peñas Negras, some 9,300 feet up Famatina, forcing Barrick to suspend activities on March 14, 2007. The blockade continues to this date (4/24/07), and according to activists, will continue until Barrick Gold and the threat of open-pit mining are gone from La Rioja.

The Fall of Governor Maza

Governor Maza said he would veto the bill, but he never got his chance. On the weekend of the blockade, the legislature passed an extraordinary measure to suspend Maza and bring him to trial for corruption.[141]

Destruction of Evidence

When the La Rioja legislature formally suspended Governor Maza for corruption and called for a prohibition on open-pit mining, ex-Gov. Maza hunkered down in his office in the capitol building, refusing to leave. While mining industry spokespersons spoke out to defend him and Barrick Gold, Maza and his party hired thugs and security guards to pose as Maza supporters and demonstrate and riot in the streets.

When provincial police dispersed the "supporters" with tear gas and escorted the ex-governor out, it became clear what happened during the night: the Maza administration had carried out a systematic destruction of all paperwork, burning the Maza machine's computers and files along with all documents linking him to Barrick Gold and other improprieties. Maza also caused bureaucratic mayhem by maliciously burning paperwork for many health and school public employees.[140]

ACCOUNTABILITY:

UN to Canada:
HOLD YOUR CORPORATIONS ACCOUNTABLE FOR HUMAN RIGHTS ABUSES

In March 2007, the United Nations Committee on the Elimination of Racial Discrimination (CERD) issued a formal recommendation to Canada. It called on Canada to better regulate and monitor its mining corporations abroad when they are operating on indigenous lands and to complete a report within the next 12 months on corporate activities. This ground-breaking recommendation marks the first time a United Nations Treaty Body has formally urged government accountability for corporate behavior outside Canadian boundaries.

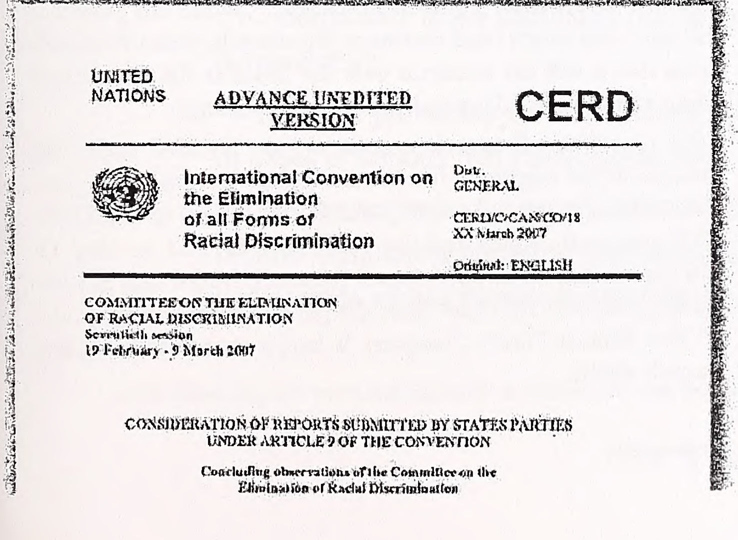
In its recommendation, the committee based its concerns on "reports of adverse effects of economic activities connected with the exploitation of natural resources in countries outside Canada by transnational corporations registered in Canada on the right to land, health, living environment, and the way of life of indigenous peoples living in these regions ...:

...the Committee encourages the State party to take appropriate legislative or administrative measures to prevent acts of transnational corporations registered in Canada which negatively impact on the enjoyment of rights of indigenous peoples in territories outside Canada. In particular, the Committee recommends to [Canada] that it explore ways to hold transnational corporations registered in Canada accountable. The Committee requests [Canada] to include in its next periodic report information on the effects of activities of transnational corporations registered in Canada on indigenous peoples abroad and on any measures taken in this regard. (Para. 17, Concluding Observations on Canada)

The CERD recommendation followed on the heels of reports by several indigenous organizations and communities on the behavior of Canadian mining companies, in particular, Barrick Gold. The reports emphasized that this was not the first time Canada had undergone scrutiny for the behavior of its corporations. In its 14th Report, adopted on June 26, 2005, Canada's Standing Committee on Foreign Affairs and International Trade had condemned Canada's mining corporations acting abroad.[142]

The Standing Committee issued a number of recommendations to Canada to reign in its corporate behavior abroad. To date, neither Canada nor companies including Barrick have implemented these recommendations.

In 2003, before the Standing Committee review and recommendations, the UN Special Rapporteur on Toxic Waste and Products had made special note of Canadian corporate behavior and lack of accountability. The report also noted that illicit movement and dumping of toxic and dangerous products and wastes by Canadian corporations had adversely impacted human rights.[143] The rapporteur recommended "that particular attention is paid to allegations relating to threats to the traditional lifestyles and rights of indigenous groups"[144] and called on "the Canadian and other Governments to explore ways of establishing extraterritorial jurisdiction over human rights violations, committed by companies operating abroad.[145]"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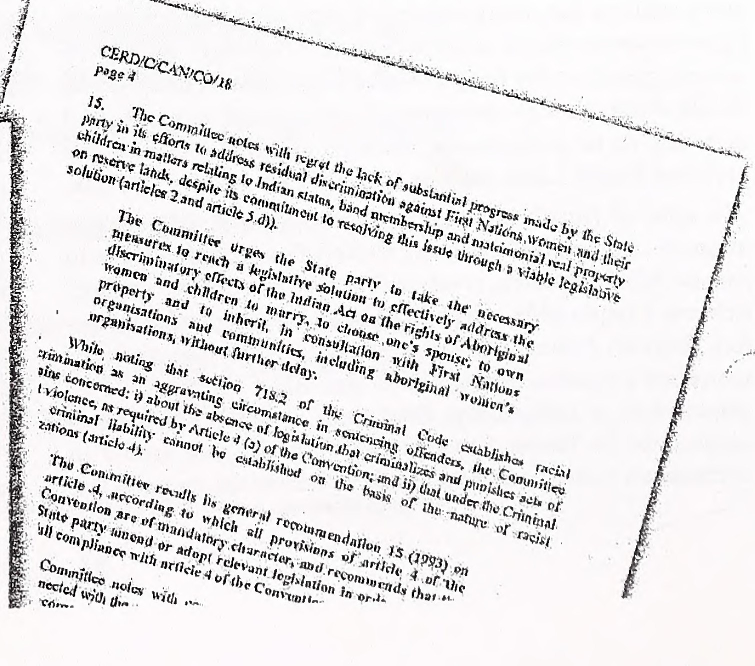
Seventieth session
19 February - 9 March 2007

CONSIDERATION OF REPORTS SUBMITTED BY STATES PARTIES UNDER ARTICLE 9 OF THE CONVENTION

Concluding observations of the Committee on the Elimination of Racial Discrimination


CERD/C/CAN/CO/18
Page 4

15. The Committee notes with regret the lack of substantial progress made by the State party in its efforts to address residual discrimination against First Nations women and their children in matters relating to Indian status, band membership and matrimonial real property on reserve lands, despite its commitment to resolving this issue through a viable legislative solution (articles 2 and article 5.d)).

The Committee urges the State party to take the necessary measures to reach a legislative solution to effectively address the discriminatory effects of the Indian Act on the rights of Aboriginal women and children to marry, to choose one's spouse, to own property and to inherit, in consultation with First Nations organisations and communities, including aboriginal women's organisations, without further delay.

While noting that section 718.2 of the Criminal Code establishes racial ...rimination as an aggravating circumstance in sentencing offenders, the Committee ...ains concerned: i) about the absence of legislation that criminalizes and punishes acts of ...violence, as required by Article 4 (a) of the Convention; and ii) that under the Criminal ... criminal liability cannot be established on the basis of the nature of racist ...zations (article 4).

The Committee recalls its general recommendation 15 (1993) on article 4, according to which all provisions of article 4 of the Convention are of mandatory character, and recommends that the State party amend or adopt relevant legislation in order ...ull compliance with article 4 of the Conventio...

...Committee notes with ... ...nected with the ...

RESPONSIBLE INVESTMENT:

HOW **ETHICAL** ARE ETHICAL SCREENERS AND "ETHICAL FUNDS"?

The socially responsible, or "ethical," investment industry is growing by leaps and bounds. In the US this market was estimated at 2.37 trillion Canadian dollars in December 2005. In Canada it is worth approximately 500 billion Canadian dollars.

Investors who are looking for a responsible way to invest their money rely on specialized research firms to screen companies on their social and environmental performance. This research is then used by ethical fund companies who market shares to their investors.

Soon after Barrick Gold took over Placer Dome, Jantzi Research reviewed the company and found it "ineligible" as an ethical investment (June 6, 2006).[146] The reasons for this decision were very good indeed. Jantzi's noted, among other things: massive outstanding environmental, economic and human health impact legacies at the disastrous Marcopper Mine in the Philippines, which Jantzi's said Barrick Gold should address rather than fight legally; a history of lack of consultation with the Western Shoshone in the U.S., which Jantzi's said Barrick should address by engaging with the Western Shoshone and addressing their concerns; environmental concerns including Riverine Tailings Disposal at the Porgera Mine in Papua New Guinea, which Jantzi's said Barrick should commit to not doing at future mines without the strong support of local communities; human rights concerns related to the killings of at least eight civilians by security guards at the Porgera Mine, which Jantzi's said Barrick should avoid through management systems and programs and reporting on its performance; the local opposition to Barrick's proposed Pascua Lama mine in a sensitive glacier area in Chile.

> In spite of Jantzi's determination that Barrick did not pass muster as an "ethical" company, Ethical Funds, which relies in part on Janzti's research, continued to advise investors that Barrick was a responsible company to hold in their portfolios.

In spite of Jantzi's determination that Barrick did not pass muster as an "ethical" company, Ethical Funds, which relies in part on Janzti's research, continued to advise investors that Barrick was a responsible company to hold in their portfolios. Before Barrick's Annual General Meeting in 2006, Ethical Funds sponsored a shareholder resolution that asked Barrick Gold to commission an independent third party review of the level of support for its Pascua Lama project.[147] As Barrick agreed to commission a review, Ethical Funds withdrew the proposal and continues to sell Barrick to its customers.[147] The review Barrick commissioned sets out what Barrick has done in the way of consultation. However, it does not indicate the level of support for the project.

In February of 2007, Jantzi Research decided that Barrick has sufficiently pulled up its socks to now meet the eligibility requirements of a responsible company.[148] How did Barrick manage that in less than one year? Jantzi Research says that the company has "made progress" in addressing some of Jantzi's concerns and that other areas of concern have been "substantially mitigated" by "additional information" the company provided to Jantzi Research. Among other things, Jantzi Research found that: Barrick is now engaging with the Western Shoshone as stakeholders; Barrick has agreed to revise the Pascua Lama project – a condition of the Chilean Government – by now mining under the glaciers, and has agreed to monitor its impacts; Barrick is also constructing a fence around its Porgera Mine and is reviewing its security guidelines and policies.

While Barrick has successful mitigated its image for the time being, time will tell how these ethical investment groups respond to the fact that the affected Western Shoshone communities continue to oppose Barrick's presence in their communities, or the fact that Barrick's activities near the proposed Pascua Lama mine have been linked to between 50 and 70 percent decreases in the mass of the three glaciers[149], while this project is still met with much local resistance. Meanwhile, Jantzi Research notes that it still has concerns over the issues at the Marcopper Mine and Riverine Disposal, among others things.

For now, Jantzi Research appears to have buckled under the pressure of the mighty dollar. Jantzi regularly compares the performance of its ethical picks (Jantzi Social Index) to the S&P/TSX composite Index and the S&P/TSX 60, and on May 11 and September 15 of 2006, Jantzi Research noted that not including Barrick Gold had "hurt the [Jantzi Social Index] most."[150] The Ethical Funds Company is happy to continue selling Barrick shares.

CONCLUSION AND RECOMMENDATIONS

The stories told in this report reflect the dirty side of gold mining: massive water depletion, indigenous struggles, government repression, waste, pollution, and poverty. These situations also reveal a story other than of environmental devastation, that of community resistance, grassroots organizing, and courageous leadership.

As the world's largest gold mining company, Barrick represents not just the abuses of one company, but the abuses of an entire industry.

In light of these facts, we recommend that Barrick meet with affected communities and negotiate in full faith with them, recognizing their rights to the land, and accepting local jurisdiction over environmental and human rights conflicts and abuses. Barrick should also compensate victims of past abuses for which it is responsible.

We also recommend that the Canadian government create measures to hold corporations accountable. In particular, we recommend that Canada:

- **establish standards and reporting obligations for Canadian companies;**
- **references international human rights standards and provides for the creation of human rights guidelines for the application of these standards;**
- **incorporates these standards into binding legislation so that compliance is mandatory;**
- **includes provisions for withholding government services from companies in cases of serious non-compliance; and**
- **creates an ombudsperson's office of independent international experts to receive complaints regarding the operations of Canadian companies worldwide and to assess corporate compliance with the standards.**

NOTE: THESE ARE THE RECOMMENDATIONS OF CORPWATCH AND NOT NECESSARILY THOSE OF THE ASSOCIATE GROUPS

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94. "In Chile, Precious Lands Often go for a Pittance" Washington Post Dec 25, 2006.
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97 http://www.mapuche-nation.org/english/html/environmental/enviro-55.htm, http://tierramerica.net/english/2005/0618/particulo.shtml
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101. "The granting of a mining lease for the Cowal Gold Project has angered Aboriginal Traditional Owners who are trying to protect their sacred heartland." http://www.rainforestinfo.org.au/gold/lakem2.html
102. This entry was submitted by the Coalition to Protect Lake Cowal.
103. Treaty of Ruby Valley 1863 (Between the U.S. and Western Bands of the Shoshone Nation, ratified by the U.S. in 1866, and proclaimed on October 21, 1869). Mining was one of the permitted activities at that time; however, the type of mining understood then was with a pick and shovel, not current processes of open pit Cyanide heap leach gold mining (available at: www.wsdp.org/treaty.pdf).
104. ibid.
105 infra para. 8 regarding the 2002 Final Report of the Inter American Commission on Human Rights.
106 Dec. 26, 2002 Final Report of the Inter American Commission on Human Rights (Dann v. U.S.).
107 Committee on the Elimination of Racial Discrimination, Concluding Observations: United States of America, UN Doc: A/56/18, paras. 380–407 (Aug. 2001) [hereinafter "CERD Concluding Observations"] and CERD Early Warning and Urgent Action Decision – 1(68) (U.S.) (available at: http://www.law.arizona.edu/depts/iplp/advocacy_clinical/western_shoshone/cerd.htm).
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123. ibid
124. Undermining Superior, Northwatch, page 7 and personal Communication with Nancy Hutchinson. USWA. 2006
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136. Francisco Jueguen, La Rioja Governor Angel Maza Linked to Gold Mining Company Operating in his Province. 9/2007 http://www.minesandcommunities.org/Action/press1232.htm
137. Francisco Jueguen
138. Autoconvocados of La Rioja: www.ciudadanospordavida.com.ar
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RESISTANCE:

OTHER ORGANIZED ACTIONS AGAINST BARRICK

Barrick's operations have destroyed livelihoods and the environment around the world, as the numerous examples in this report illustrate. Communities from Argentina to Papua New Guinea have organized to demand their basic human rights and resist the exploitation of their natural resources.

They use strategies like grassroots organizing, lawsuits, formal declarations, and protests to communicate their dissatisfaction to the world.

This report is being released on the occasion of Barrick's 2007 annual meeting, which has been declared an International Day of Action Against Barrick Gold by affected communities in six countries.

Nor is this the first time that groups have protested against the company. A few such past protests include:

ARGENTINA: October 20, 2004: The Madres Jachaleras Autoconocados and four other groups in Jachal, Argentina, held its first Congress in Defense of Natural Resources. It also featured a "No a la Mina" ("No to Mining") rock festival, attracting hundreds of youth.

CHILE: June. 4, 2005: An estimated 2,500 people protest against the Pascua Lama Project in Vallenar, Chile. On the same day, a thousand people marched in Santiago, while solidarity events were held in Barcelona, London, and Cambridge.

November 11, 2005: Citizens presented a letter with over 18,000 signatures to the President of Chile, but were met with police violence when they tried to place chunks of ice in front of the La Moneda government palace. The next day, more demonstrations were held in Vallenar and Santiago.

January 25, 2007: 80 people peacefully close an intersection of the roads in Alto del Carmen, to stop mining trucks going to Pascua Lama.

PERU: April 11-12, 2007: A 48 hour "unemployment strike" was held to demand the cancellation of contracts with Barrick's Pierina Mine, Peru. While this protest was supported by the president of the Ancash region, Caesar Alvarez, that did not stop the police from violently repressing the protesters, and killing a nineteen year old boy. This is the third year in row that police have violently clashed with thousands of protesters at a Barrick protest in the Ancash region. (see page 4)

AUSTRALIA: Community opposition to the Lake Cowal gold mine dates back 12 years. Wiradjuri activists and supporters have been protesting against the mine for seven years. Actions at Barrick's Australian and Canadian headquarters and mine site convergences since 2002 have attracted Australian and international demonstrators. In 2006 and 2007, protestors shut down the mine, resulting in arrests.

PNG: April 24, 2007: Local landowners blocked the access route to the mine and forced operations to stop at Barrick's Porgera gold mine.

TITLE PHOTO: MARCH AGAINST BARRICK IN VALLENAR, CHILE JUNE 2005. PHOTO: LUIS MANUEL CLAPS

Transnational Mining Tribunal: The Case of Barrick Gold Corporation in Latin America (Chile, Argentina and Peru)

On November 25, 2006, a panel of judges from civil socitey groups ranging from Amnesty International Chile, to religious and indigenous rights groups, heard testimonies from civil society and traditional communities from Chile, Argentina, and Peru at the Transnational Mining Tribunal in Santiago, Chile. The panel judged "that the mining firm Barrick Gold Corporation is responsible for serious environmental, social, cultural, and economic affronts as a product of its policies, programs and actions against the territories and peoples of Argentina, Chile, and Peru." The judges setenced Barrick "to immediately pay just restitution to the victims of its policies, programmes and actions, and to restore the ecosystems affected by its mining investments." PHOTO: ISABEL ORELLANA

Published May, 2007 by CorpWatch

With contributions from: David Modersbach, Joan Kuyek, Julie Fishel, Catherine Coumans, Grupo No A Pascua Lama (Isabel Orellana, Marie-Ève Marleau, Juan Carlos Chirgwin, Jimena Campos, Gloria Pereira-Pabenburg and Rolando Labraña), Coalition to Protect Lake Cowal Members (Natalie Lowrey, Jane Morrison, Ellie Gilbert, Ruth Rosenhek, Al Oshlack, Binnie O'Dwyer, and Mia Pepper), Sakura Saunders, David Martinez, and Luis Manuel Claps.

Special thanks to: Asaf Zulah, Assembly of the City of La Rioja Against Open-Pit Mining, Azibuike Akaba, Beatriz Vignoli, Brunswick Theatre, Carrie Dann, Christian Peña, Clive Shirley (Global Aware), CONACAMI, David Jay, David Taylor, Jamie Cao, Javier Rodriguez Pardo, Jeb Tankersley, Karina Roitman, Liam O'Donoghue, Lucio Cuenca, Momoko Saunders, Naomi Klein, Natalie Cadranel, Observatorio Latinoamericano de Conflictos, Ambientales (OLCA), Poonam Whabi, Amy with Radical Designs, Rights Action, Sarolta Jane, Sister Maria Jose, Madres Autoconvocados, The Movimiento Ciudadano Anti Pascua Lama, Tim Simons, Tracy Glynn, and Tundu Lissu.

This report was edited by Terry Allen, Sakura Saunders, and Pratap Chatterjee.

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A CORPWATCH REPORT
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in association with:

Western Shoshone Defense Project WWW.WSDP.ORG
MiningWatch Canada WWW.MININGWATCH.CA
Mines and Communities WWW.MINESANDCOMMUNITIES.ORG
Friends of the Earth, Australia WWW.FOE.ORG.AU
Coalition to Protect Lake Cowal WWW.SAVELAKECOWAL.ORG
Rainforest Information Center WWW.RAINFORESTINFO.ORG.AU
Observatorio Latinoamericano de Conflictos Ambientales WWW.OLCA.CL
Grupo No A Pascua Lama, Montreal

BARRICK'S DIRTY SECRETS

COMMUNITIES WORLDWIDE RESPOND TO GOLD MINING'S IMPACTS

Response No. I-1: *Statements noted. Regarding reference to the Treaty of 1863, please refer to Response O-16 for additional information.*

Response No. I-2: *Statement noted.*

Response No. I-3: *Statement Noted.*

Response No. I-4: *Statement Noted.*

Response No. I-5: *Statement noted.*

JIM GIBBONS
Governor

STATE OF NEVADA

ANDREW K. CLINGER
Director

DEPARTMENT OF ADMINISTRATION
209 E. Musser Street, Room 200
Carson City, Nevada 89701-4298
(775) 684-0222
Fax (775) 684-0260
http://www.budget.state.nv.us/

February 3, 2009

Lynn Bjorklund
US Department of the Interior
Bureau of Land Management
Ely District Office
HC 33 Box 33500
702 No. Industrial Way
Ely, NV 89301-9408

Re: SAI NV # **E2009-172** Reference:

Project: **Bald Mountain and Mooney Basin North Operations Area DEIS**

Dear Lynn Bjorklund:

Enclosed are comments from the agencies listed below regarding the above referenced document. Please address these comments or concerns in your final decision.

Division of Water Resources

State Historic Preservation Office

The following agencies support the above referenced document as written:

Commission on Minerals

This constitutes the State Clearinghouse review of this proposal as per Executive Order 12372. If you have questions, please contact me at (775) 684-0213.

Sincerely,

R. Tietje
Nevada State Clearinghouse

J

Nevada State Clearinghouse

From: Sue Gilbert
Sent: Wednesday, December 24, 2008 9:49 AM
To: 'clearinghouse@budget.state.nv.us.'
Subject: E2009-172

From: Nevada State Clearinghouse
Sent: Monday, December 22, 2008 9:00 AM
To: Robert K. Martinez
Subject: E2009-172 Bald Mountain and Mooney Basin North Operations Area DEIS - Bureau of Land Management

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0213 Fax (775) 684-0260

TRANSMISSION DATE: 12/22/2008

Division of Water Resources

Nevada SAI # E2009-172

Project: Bald Mountain and Mooney Basin North Operations Area DEIS

Follow the link below to download an Adobe PDF document concerning the above-mentioned project
for your review and comment.
E2009-172

J-1 Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local
areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than Thursday, January 29, 2009.

Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference.

Clearinghouse project archive

Questions? Reese Tietje, (775) 684-0213 or clearinghouse@state.nv.us

____No comment on this project __x__Proposal supported as written

AGENCY COMMENTS:

J-1 All waters of the state belong to the public and may be appropriated for beneficial use pursuant to the provisions of Chapters 533 and 534 of the Nevada Revised Statutes and not otherwise. All use of drilling water and/or dust control water shall be pursuant to waiver or permit granted by the state engineer. A waiver to drill a temporary water source well to support mineral exploration may be granted by the state engineer upon request and a show of good cause. All boreholes or wells shall be plugged and abandoned in compliance with Chapter 534 of the Nevada Administrative Code (NAC). If flowing water is encountered it shall be controlled as required in NRS § 534.060 (3).

If existing water Permits are to be utilized, verify that the point of diversion, place of use and manner of use are still consistent with proposed usage. If not, contact the Division of Water Resources for additional permitting assistance.

Signature: Diana Lefler

Date: 12/23/2008

Response No. J-1: *Statement noted. The 43 CFR 3809 regulations require that operators comply with all requirements of all agencies that have authority to regulate mine activities.*

K

1/13

Rebecca Palmer

From: Nevada State Clearinghouse
Sent: Monday, December 22, 2008 9:00 AM
To: Rebecca Palmer
Subject: E2009-172 Bald Mountain and Mooney Basin North Operations Area DEIS - Bureau of Land Management

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0213 Fax (775) 684-0260

TRANSMISSION DATE: 12/22/2008

State Historic Preservation Office

Nevada SAI # E2009-172
Project: Bald Mountain and Mooney Basin North Operations Area DEIS

Follow the link below to download an Adobe PDF document concerning the above-mentioned project for your review and comment.
E2009-172

Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local
areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than Thursday, January 29, 2009.

Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference.

-1 The SHPO reviewed the subject document. In general, the SHPO supports the document as written with one exception. On page 3-149 please correct the last sentence in the second paragraph. Surveys over 10 years in age should be evaluated for their adequacy in accord with the existing statewide Protocol Agreement between this office and the Bureau of Land Management or the existing Programmatic Agreement for the subject undertaking. This office does not make such determinations. If you have any questions concerning this correspondence, please contact me by phone at (775) 684-3443 or by e-mail at Rebecca.Palmer@nevadaculture.org.

Rebecca L Palmer 1/8/09

Response No. K-1: *This correction has been made in Section 3.19 of the FEIS.*

L

From: Nevada State Clearinghouse
To: Lowell Price
Subject: E2009-172 Bald Mountain and Mooney Basin North Operations Area DEIS - Bureau of Land Management
Date: Monday, December 22, 2008 8:59:42 AM

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0213 Fax (775) 684-0260

TRANSMISSION DATE: 12/22/2008

Commission on Minerals

Nevada SAI # E2009-172
Project: Bald Mountain and Mooney Basin North Operations Area DEIS

Follow the link below to download an Adobe PDF document concerning the above-mentioned project
for your review and comment.
E2009-172

Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local
areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than Thursday, January 29, 2009.

Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference.

Clearinghouse project archive

Questions? Reese Tietje, (775) 684-0213 or clearinghouse@state.nv.us

L-1 ____No comment on this project __x__Proposal supported as written

AGENCY COMMENTS:

Signature:

Lowell Price

Digitally signed by Lowell Price
DN: cn=Lowell Price, o=Nevada Division of Minerals, ou=Commission on Mineral Resources, email=Lprice@govmail.state.nv.us, c=US
Date: 2008.12.23 16:11:39 -08'00'

Response No. L-1: *Statement noted.*

M

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Blvd., Suite 234
Reno, Nevada 89502
Ph: (775) 861-6300 ~ Fax: (775) 861-6301

February 2, 2009
File No. 2009-FA-0057

Memorandum

To: District Manager, Ely Field Office, Bureau of Land Management, Ely, Nevada

From: Field Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Comments on the Draft Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the proposed Bald Mountain Mine North Operations Area Project (Project), located approximately 65 miles northwest of Ely, Nevada in White Pine County. The Project proposes to expand current mining operations including open pits, rock disposal facilities, heap leach facilities, and haul roads. The expansion will result in a total of 8,080 acres of disturbance within the new boundary encompassing both private and public lands.

The U.S. Fish and Wildlife Service (Service) has reviewed the DEIS and is providing the following comments pursuant to the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*), Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, and the Bald and Golden Eagle Protection Act, 16 U.S.C. 668. We recommend protection of wetlands pursuant to Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act. Other fish and wildlife resources should be considered pursuant to the Fish and Wildlife Coordination Act, as amended (48 Stat. 401, 16 U.S.C. 661 *et seq.)*, and the Fish and Wildlife Act of 1956, as amended (70 Stat. 1119, 16 U.S.C. 742a).

General Comments

1 Based on the information in the DEIS, direct impacts to greater sage-grouse (*Centrocercus urophasianus*) leks are not anticipated as no leks are known to occur within the Project boundary. However, because leks have been documented within a few miles of the Project boundary, greater sage-grouse likely use portions of the Project area as nesting, brood rearing and wintering habitat. The Service is currently conducting a status review for the species for

potential listing under the Act. We recommend the DEIS analyze the impacts that authorization of this Project may have on local and range-wide sage-grouse populations as well as other sagebrush obligate species such as the pygmy rabbit (*Brachylagus idahoensis*).

M-2 We are also concerned with the heap leach ponds and their potential impacts to migratory birds through acute cyanide toxicity. In semiarid areas, these ponds attract migratory birds to certain death if they are not appropriately monitored to ensure exclusionary devices work. Finally, we

M-3 strongly recommend that existing and proposed above-ground power lines be retrofitted or constructed in accordance with *Suggested Practices for Raptor Protection on Power Lines - The State of the Art in 2006* (Edison Electric Institute/Raptor Research Foundation). Information can be found at *http://www.aplic.org/*

Specific Comments

M-4

1. <u>Page 2-38, Section 2.3.9, Support Facilities</u>: The DEIS states that a new power line would be constructed from a substation near the Mooney Basin process facility to the Top/Sage Pit Complex area. The Service urges you to take strong precautionary measures to protect raptors by raptor-proofing power lines. Two primary causes of raptor mortality are electrocutions and collisions with power lines. Therefore, power lines should be designed, constructed or retrofitted in accordance with Edison Electric Institute/Raptor Research Foundation (2006).

M-5

2. <u>Page 3-67, Section 3.8.2, Wildlife Environmental Consequences:</u> The DEIS states that process ponds containing cyanide and other hazardous chemicals would be fenced and covered with polyurethane balls; therefore, impacts to wildlife from hazardous chemicals are not expected. The Service commends the Bureau of Land Management (BLM) for requiring measures to prevent migratory bird and other wildlife contact with potentially lethal chemicals in the pond solution. However, the effectiveness of the fencing and polyurethane balls can only be ensured through monitoring. We recommend that the mine develop and implement a process pond monitoring plan. The BLM and its applicants are obligated under the MBTA to prevent migratory birds from entering these ponds.

M-6

3. <u>Page 3-73, Section 3.8.4, Migratory Birds Environmental Consequences</u>: The DEIS states that land-clearing activities would be conducted outside of the avian breeding season (April 15 to July 15). It also states that if land clearing during the nesting season is necessary, a qualified biologist would survey for active nests and signs of nesting and, if necessary, buffers would be created around active nests until young have fledged. The Service commends the BLM and its applicant for taking actions to minimize impacts to migratory birds. In addition to these measures, we recommend annual avian surveys in areas proposed for development as well as areas under development to determine avian use. This information is valuable during early project planning to ensure compliance with the MBTA.

We look forward to working with you throughout the planning process for this project. If you have further questions regarding our comments or your responsibilities under the Act or other policies mentioned please feel free to contact me or James Harter at 775-861-6300.

for Robert D. Williams

cc:
Project Leader, Ruby Lake National Wildlife Refuge, Nevada

Reference

Edison Electric Institute and the Raptor Research Foundation. Suggested Practices for Raptor Protection on Power Lines - The State of the Art in 2006. Washington, D.C.

Response No. M-1: *Impacts to the sage grouse and pygmy rabbits have been discussed in Section 3.8.6 of the FEIS. Consultation with NDOW confirms the area surrounding the North Operations Area Project has limited use as sage grouse brood rearing habitat because of the lack of water. Additionally, because this project is an expansion of an existing large-scale operation, these species tend to avoid the area because of the level of human activity.*

Response No. M-2: *Section 2.3.5 Design and Operation of the FEIS discusses the exclusionary methods for heap leach ponds that BMM currently use. These procedures would continue to be used with additional ponds for the North Operations Area Project. Any incidents involving migratory birds are recorded and reported to NDOW.*

Response No. M-3: *The construction and/or retrofitting of power lines to meet the criteria in the Suggested Practices for Raptor Protection on Power Lines has been added to Table 2-13 of the FEIS as a design feature.*

Response No. M-4: *See Response M-3.*

Response No. M-5: *See Response M-2.*

Response No. M-6: *The BLM has previously established the avian breeding season for the period of nest building and egg-laying through fledging of young birds. The applicant, in conducting nesting bird surveys during the avian breeding season, meets the requirements established by the BLM. Surveys during this period would be sufficient to ensure compliance with the Migratory Bird Treaty Act.*

N

EUREKA COUNTY BOARD OF COMMISSIONERS

J.P. "Jim" Ithurralde, Chairman
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Mike Page, Member

P.O. Box 677
10 South Main Street
Eureka, Nevada 89316

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Bureau of Land Management
JAN 29 2009
RECEIVED

January 27, 2009

Lynn Bjorklund
Bureau of Land Management, Egan Field Office
HC 33 Box 33500
Ely, Nevada 89301-9408

RE: 380910 NV040, N82888

Dear Ms. Bjorklund:

Other than as noted in the comments below, the Eureka County Board of Commissioners supports the proposed action of the DEIS for the Bald Mountain Mine North Operations Area Project. We ask that the following comments be considered and addressed in the final EIS:

1. 3.10.2 Page 3-94—states that the loss of grazing lands and AUMs would "have a negligible effect on grazing." This assertion may carry more weight in this particular circumstance because the grazing permit is held by Barrick Gold and Barrick Gold is in the business of mining. Regardless of whom holds the grazing permit, *any* loss of AUMs is detrimental to the majority of permittees who rely upon these forage resources as a way of life. These impacts can add up substantially over the long-term and these impacts can be quantified (i.e. forage values, loss of livestock production). What may be "negligible" to one grazing permittee may prove substantial to another. It is these grazing lands that have provided and will continue to provide a stable socioeconomic base to rural Nevada counties. In order to avoid setting a negative precedent, any impact to grazing should be quantified, addressed, and mitigation outlined within the final EIS.

2. 3.11.1 and 3.11.2 Page 3-99—reports that AML of the Triple B HMA is "between 250 and 518" and summarizes the number of horses gathered since 1997 in order to "achieve appropriate management levels." 3.11.2 states that "The BLM's final allotment decisions and control of the number of wild horses in the herd area would maintain wild horse populations at the appropriate carrying capacity of the range." What assurances can be made in keeping the herd at AML when the number of wild horses present in the Triple B HMA is already above the high end AML (555 in July 2008)? An estimate of wild horse numbers currently in the Triple B HMA should also be included in the EIS to allow for full disclosure and understanding of the degree of impact upon wild horses. The DEIS does a fine job in addressing the impacts *to* wild

horses but does nothing to address the impacts *of* wild horses upon other resources. Additional impacts upon forage and water resources in adjacent HMAs (e.g. Diamond Complex) and grazing allotments will undoubtedly occur as wild horses are displaced to these areas. If livestock numbers must be reduced (see comment 1) then wild horse numbers must be reduced as well. Placing stipulations upon grazing permittees without similar stipulations for reducing wild horse numbers is unreasonable. Specific language should be included in the EIS which assures that the BLM will reduce the number of horses in the HMA and keep the HMA at the low AML.

N-4

3. 3.17—the DEIS reports that 14 percent of BMM employees currently live in Eureka. It is anticipated that the same percentages will continue with the proposed action of adding approximately 110 new employees. Page 3-145 states that the total population could increase by approximately 330 people. If 14 percent of 330 people choose to live in Eureka, this would add 46 new people to Eureka. While this number represents only about 3 percent of the total population of Eureka County, these people would live in southern Eureka County thereby increasing the impact disproportionately. Further, page 3-140 states that the County is

N-5

considering leasing properties for development of residential facilities in preparation of the expected housing demands of the Mt. Hope Project. It should be noted that 10 percent of the 200+ units in this proposed development will be available for the general public. Also, many

N-6

developers have recognized the lack of quality housing in Eureka County and have bought land in speculation of future development and some have even had parcels approved. It is reasonably foreseeable that more housing will become available within the very near future and with Eureka being the nearest residential area to BMM, more BMM employees would choose to live in Eureka. Perhaps analysis could be included in the EIS which has a range of impacts that Eureka County can anticipate such as if percentages stay as they are now or if an additional 20-40 housing units become available within the next couple of years.

We appreciate the opportunity to comment on this DEIS and again express our support of the project with any caveats noted in the comments above.

Respectfully,

J.P. "Jim" Ithurralde, Chairman
Eureka County Board of Commissioners

Response No. N-1: *Statement noted.*

Response No. N-2: *The impacts to grazing have been identified for the allotment and not for the current permittee. Impacts have been addressed in Section 3.10.2 of the FEIS.*

Response No. N-3: *The current estimated size of the Triple B Herd Management Area is 555 horses. The initial Appropriate Management Level for the Triple B Herd Management Area, as discussed in the Ely District Approved Resource Management Plan, ranges between 250 and 518 animals. This information has been added to Section 3.11.1 of the FEIS. When adjusting the Appropriate Management Level, the BLM will take into account the available resources in the herd management area.*

Response No. N-4: *Section 3.17.2 of the FEIS discussed the lack of available housing in Eureka and therefore it is anticipated that the majority of the additional employees would choose to live in Ely or Elko. The current trend is for fewer people to live in Eureka. At a rate of 14% with 110 new employees, the increase in population in Eureka is expected to be 15 people.*

Response No. N-5: *Statement noted.*

Response No. N-6: *Statement noted.*

O

Great Basin Resource Watch

85 Keystone Ave., Suite K
Reno, NV 89503
775-348-1986
www.gbrw.org

Our mission is to protect the health and well being of the land, air, water, wildlife, and human communities of the Great Basin from the adverse effects of resource extraction and use.

February 2, 2008

ATTN: Lynn Bjorklund
Environmental Protection Specialist/Minerals
Bureau of Land Management
Ely Field Office
HC 33 Box 33500
Ely, Nevada 89301-9408

Re: comments on the *Draft Environmental Impact Statement for Bald Mountain Mine North Operations Area Project, BLM/NV/EL/ES-GI08/05+1793*

Water related issues

According to the draft Environmental Impact Statement (DEIS) dewatering for pit expansion is not anticipated, and only perched aquifers may be intersected.
O-1 Therefore, the impacts to groundwater are minimal. GBRW does note the potential impact to the Cherry Spring due to loss of recharge areas. The DEIS does not list any mitigation measure for this impact. GBRW recommends that the
O-2 BLM investigate mitigation options. Perhaps the Sage Flat Rock dump should not be expanded with the waste rock handled elsewhere; to be eventually part of the backfill for the pits assuming that it is not acid generating.

O-3 GBRW does support the proposal to backfill pits <u>where it is clear</u> that potential water infiltration will not react disfavorably with the waste rock backfill. The
O-4 DEIS indicates that complete backfilling of the pits was rejected from further analysis due to economic reasons. There should be some data to support this rejection. The environmental argument presented by BLM for partial backfilling is
O-5 certainly even more true for full backfilling. The final EIS should provide more economic analysis information.

The Waste Rock Management Plan (WRMP)[1] states that the rock is generally of oxide type with low sulfide content, and goes on to say that *"Although trace sulfides are present, and available alkalinity for acid generation is limited, acid generation does not occur."* In referring to Appendix A of reference 1, "Quarterly Waste Rock Monitoring Report," indeed this statement is supported. However, more recent acid/base static testing done in 2007 shows a net acid generating capacity[2]. The RBMWF-1 and RBMWF-S samples show that for the 1st Quarter AGP > ANP. It should also be noted that within the same reports the previous reporting quarter, 3rd Quarter 2006, the AGP < ANP. This shows the variation in waste rock as mining proceeds, but it may also indicate the range possible within the realm of static
O-6 testing. In general, there needs to be further testing to get a more accurate

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1 Placer Dome U.S. Bald Mountain Mine, *North Operations Area: Bald Mountain Mine (N-68193)/ Mooney Basin (N46-94-010P) Amendment to Plan of Operations, Appendix D*, Elko NV, September 2006.

2 NDEP form 0090 MWMP/ABA, RBMWF-1 and RMBWF-S.

O-6 prediction of acid generation, and so kinetic testing needs to be done as well. The draft EIS does not contain a plan to handle acid generation should it occur. In particular, Appendix D of the DEIS (which is out of order in the document) does show acid generation characteristics with little to no neutralizing capacity for the BIDA pit rockl It is not clear how the potentially acid generating rock from this pit is to be handled. In our experience, predictions are often far off the mark, so detailed plans are needed for public review to assure that the Bald Mountain Mine will be able to mitigate in the event of acid generation.

O-7 The DEIS does not contain a map showing water monitoring across the site, and anticipated locations of future monitoring wells as the new facilities are developed. It is important for public transparency to reveal the monitoring regiment to assure that it is effective and protects groundwater resources including perched aquifers.

O-8 In the reclamation plan included within in the Plan of Operations (PoO)under the section "Chemical Stabilization" section states: *"Site data indicates that recirculation or rinsing beyond the point in time where economic gold recovery is no longer achieved provided no additional benefits to long-term chemical stability."*[3] Indeed, this is a fortuitous finding for the Bald Mountain. The data and analysis referred to here was not included in the draft EIS and should be. The PoO goes on to state that *"… rinsing is not expected to be beneficial or required to detoxify the heaps…"*[4] GBRW understands these statements to mean that neither recirculating leach fluid or rinsing with fresh water is beneficial. The draft EIS does not, and should, fully explain how this conclusion was reached including supporting data.

<u>Land related issues</u>

O-9 Clearly there are significant impacts to migratory animals, in particular, the mule deer routes go right through the project area. There are a few suggestions in the DEIS to allow for better mobility of the deer across haul roads, pg. 3-68. GBRW suggests that BLM explore more aggressive measures including different haul road routing to avoid known deer trails or other structures like tunnels or overpasses.

O-10 GBRW is very concerned about the loss of Piñon/Juniper forest areas, and strongly recommends the BLM to work with Barrick gold U.S., Inc. to develop an approach to decrease the number of impacted acres.

<u>Air related issues</u>

O-11 The DEIS does not, and should give information as to the mercury content in the ore for reference.

O-12 The State of Nevada Mercury Control Program is mentioned in the DEIS, but there is no discussion of the type of mercury controls that are in place or anticipated controls. Ore samples need to be analyzed for mercury content, and there should be a plan for continued ore testing for mercury as mining proceeds.

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[3] Ref. 1, pg. 3-7.

[4] Ref. 1, pg. 3-7

Cultural/community related issues

O-13 The DEIS in the "cultural resources" section, pp. 3-148-3-149, fails to discuss the significance of "pine-nutting" in the general area by Native Americans. The loss of Piñon as discussed in the DEIS is likely to impact this cultural activities and it must be addressed in the EIS.

O-14 There is also no mention of the resolution by the South Fork Band of the Western Shoshone that is in opposition to the project. The EIS needs to address the issues raised in their resolution. Find the resolution attached.

O-15 The negative impacts of the "boom and bust" nature of mining on the local communities is under addressed. The EIS should look at the historical record here and discuss impacts from that vantage point as well as the current economic climate.

O-16 The project is within land outlined in the Treaty of Ruby Valley, between the United States and the Western Shoshone Nation, so mineral rights were reserved and therefore continue to belong to the Western Shoshone Nation. The use of "gradual encroachment" is not a legally valid method of title transfer or extinguishment under existing federal law or recognized standards of human rights. Between February 20 and March 10, 2006 the United Nations Committee for the Elimination of Racial Discrimination, issued a decision of an "Early Warning and Urgent Action Procedure" handed down to the United States of America.[5] The decision pertains to US lands and therefore BLM or Forest Service public lands on which the project may in part be located. The relevant aspect of this decision is that the U.S. is to "freeze any plan to privatize Western Shoshone ancestral lands for transfer to multinational extractive industries and energy developers, and desist from all activities planned and/or conducted on the ancestral lands of Western Shoshone or in relation to their natural resources, which are being carried out without consultation with and despite protests of the Western Shoshone peoples." Thus, the project must seek consultation and permission from the Western Shoshone on their lands.

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[5] United Nations, International Convention On the Elimination Of all Forms of Racial Discrimination, CERD/C/USA/DEC/1 11 April 2006, "COMMITTEE FOR THE ELIMINATION OF RACIAL DISCRIMINATION, Sixty- eighth session, Geneva, 20 February – 10 March 2006." http://www.unhchr.ch/tbs/doc.nsf/898586b1dc7b4043c1256a450044f331/25eeac288211bee9c1257181002a3cfb/$FILE/G0641251.pdf

Please feel free to contact John Hadder if you have any questions or concerns.

Sincerely,

John Hadder
Staff Scientist
Great Basin Mine Watch

Larson Bill
Western Shoshone Defense Project

cc:
Roger Flynn, Western Mining Action Project

Response No. O-1: *Monitoring of Cherry Spring conducted by Barrick has indicated large fluctuations in the water level at the spring over the last couple of years (Section 3.2, Table 3.2). The reasons for these fluctuations are unknown, but given that there are no developed mine features currently within the Cherry Springs recharge basin, it appears they are likely due to several years of below average precipitation conditions in the region. Because of these recent fluctuations in the water level at Cherry Spring, determining potential impacts based on activities associated with the mine would be difficult. No mitigation is warranted at this time due to the current conditions of the spring and the uncertainty associated with potential impacts to the spring. Barrick will continue to monitor Cherry Spring. It should be also noted the BLM's preferred alternative will result in the removal of 94% of the proposed disturbance in the Cherry Spring recharge basin.*

Response No. O-2: *The BLM selected preferred alternative results in the partial backfill of Sage Flat Pit. This partial backfill would reduce the size of the proposed Sage Flat Rock Disposal Area. This reduction in the proposed Rock Disposal Area in turn reduces the acres within the Cherry Spring recharge area that would be covered by waste rock. The acres of the Cherry Spring recharge area covered by waste rock under the BLM preferred alternative would be 9 acres, which is approximately 52.1 acres less than the Proposed Action and represents only 10% of the recharge area. With the reduction, impacts are anticipated to be negligible. Appropriate changes have been incorporated into the FEIS.*

Response No. O-3: *Statement noted.*

Response No. O-4: *The Partial Backfill Alternative was economically viable because one pit could be backfilled with material from a nearby pit during active operations. This eliminates the need to double-handle waste rock to backfill the pits. Double-handling of material increases fuel needs and therefore combustion emissions, involves effectively doubling the amount of fugitive dust and particulate emissions, requires more water resources, extends the period of time for re-establishing vegetation, and does not decrease disturbance due to the need to stockpile material until mining has been completed in the pit. Additionally, to completely backfill the pits would add significant additional costs to the project. According to the BMM, based on current operating costs of approximately $1.00/mined ton at the site, to double-handle the 631 million tons of material associated with the preferred alternative would cost at least an additional $631,000,000; thus making the project uneconomic. This would result in the Proposed Action not meeting either BLM's or Barrick's purpose and need as stated in Section 1.3 of the FEIS.*

Response No. O-5: *See Response O-4.*

Response No. O-6: *A Waste Rock Management Plan (Plan) has been prepared for the Proposed Action in accordance with BLM guidelines and Nevada Division of Environmental Protection regulation to evaluate waste rock characteristics. Meteoric Water Mobility Procedure, Acid Base Accounting testing, kinetic testing, and mineralogic and geologic assessments were performed and documented in the Plan Section 2.3.4. Additional static and kinetic testing has also been conducted and is reported in Schafer (2009). Findings indicate that the rock types are net neutralizing. As required by Nevada Division of Environmental Protection regulation and BLM guidelines, quarterly Meteoric Water Mobility Procedure, acid base accounting and kinetic* *(where indicated) testing will be performed on the actual mined waste rock material to insure that the predictions made in the Plan are consistent with actual results.*

Response No. O-7: *Existing monitoring well locations are shown on Figure 3-4 as Bald 1, Bald 2, MWW 1, MWW 1R, MWW 2, and MWW 3. Proposed monitoring locations are discussed in Section 2.3.6 of the FEIS and shown on Figure 2-12. Additional monitoring locations associated with the heap leach expansion would be determined as part of the permitting process with Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation.*

Response No. O-8: *Rinsing of heap leach pads is no longer an industry standard procedure. Rinsing with freshwater only increases the amount of solution to be managed during draindown. As part of the heap leach closure, leach solution will be recirculated during process fluid stabilization. In addition to recirculation of leach solution, active evaporation would be used to reduce the total volume of solution. Once the solution inventory has been reduced to a level that evapo-transpiration cells could handle, recirculation and active evaporation would be halted. Additional details on the heap leach reclamation and process fluid stabilization are provided in the Plan of Operations (BMM, 2009), which is available for review at the BLM Ely District Office.*

Response No. O-9: *BMM has operated properties within the Plan of Operations boundary since 1983. During this time in operation, even during recent mining activity, no substantial impediments to deer movements have been observed on or near the mine; and deer mortalities on the haul road during the existing operational period are very low. The proposed mine plan used existing routes where possible with limited addition of new roads. The installation of berm gaps along haul roads are a recommendation from the NDOW. The BLM has agreed with this recommendation, with the applicant including this as part of the Proposed Action. Based on this recommendation, the BLM does not believe additional mitigation measures are needed.*

Response No. O-10: *The BLM developed and analyzed two alternatives to the proponents Proposed Action that would decrease the surface disturbance created by the mining activity.*

Response No. O-11: *Based on information received from BMM, the weighted average of mercury content from drill hole data from mining zones for 2008 is 3.16 ppm. This information has been added to Section 3.14.2 of the FEIS.*

Response No. O-12: *Table 3-21 in Section 3.14.2 shows the current mercury controls. The proposed mercury controls are expected to be compliant with the Nevada Maximum Achievable Control Technology or a proposed federal maximum achievable control technology for mercury. See response to O-11 regarding ore mercury content.*

Response No. O-13: *Section 3.12.1 notes pine nut gathering is a current land use and an important part of Native American traditions. Section 3.12.2 notes the impacts from the Proposed Action would be minimal because the current level of pine nut gathering in the area is light and vast amounts of pinyon forest on public land would remain available.*

Response No. O-14: *The BLM only became aware of the June 26, 2007, resolution when it was included with comments to the FEIS. All resources identified in the South Fork Band Resolution No. 07-SF-19 (such as grazing, water resources, pine nut areas, etc.) have been identified and addressed in the FEIS document. Please refer to Responses C 1-3 for additional information.*

Response No. O-15: *The FEIS acknowledges that mining has been a major economic force in the study area since the mid-1800s and the economies of the three counties tend to follow the cycles of hard rock mining activity even today. The 10-year range of county unemployment rates cited in the FEIS show the degree to which economic activity can fluctuate in a relatively short time. Estimating economic impacts is always imprecise because so many factors cannot be predicted; however, the by-county discussion of current economic conditions and IMPLAN modeling results presented in Section 3.17.1of the FEIS would be sufficient to judge the project's likely economic impact.*

Response No. O-16: *The Indian Claims Commission determined Western Shoshone title had been extinguished. This issue and the associated compensation issues have been the subject of numerous lawsuits. While all courts addressing the issue have rejected Western Shoshone claims to continued ownership of these lands, some Western Shoshone still maintain title to their ancestral lands has not been extinguished. The U.S. State Department has responded to the U.N. Committee on the Elimination of Racial Discrimination (CERD) decision--see the Periodic Report of the United States of America to the U.N. Committee on the Elimination of Racial Discrimination concerning the International Convention on the Elimination of All Forms of Racial Discrimination, April 2007. Consultation with Western Shoshone and other potentially affected tribes is ongoing. As noted, the U.S. State Department has disputed the CERD decision and BLM is not required to seek permission for this or other actions on public lands managed by the agency.*

P

----- Forwarded by Lynn Bjorklund/EYFO/NV/BLM/DOI on 01/07/2009 09:51 AM -----

	"Larry Kibby" <lkibby1@citlink.net>
To	<Lynn_Bjorklund@nv.blm.gov>
	01/07/2009 06:05 AM
cc	
Subject	Expansions of Bald Mountain and Mooney Basin mines

Tuesday, January 6, 2008

To: Lynn Bjorklund
BLM Ely District Office
HC 33 Box 33500
Ely, NV 89301

From: Larry Kibby
Elko Indian Colony
1581 Pinenut Circle
Elko, Nevada 89801

Regarding the proposed expansion of Bald Mountain and Mooney Basin

mines,
P-1 my main concerns and interest are:

(A) Water & Ranching Water Right's
(B) The Preservation and Protection of American Indian Cultural and Natural Resources
(C) The Preservation & Protection of Wildlife and Wildlife Habitat
(D) The Preservation & Protection of Natural Resources

The aforementioned concerns and interest are valid respects that must be regarded with all due care in any proposed "Expansion" on-going activity in which Water, Land, Natural and Cultural resources are impacted and I would hope that "Truth and Honesty" will be utilized in the formation of the EIS by the Bureau of Land Management.

P-2 The Non-Indian and American Indian Ranching communities have suffered at various times cut-back's in AUM's due to Drought and Rangeland Fire conditions. The lack of moisture vital to refurbishing land, water areas and vegetation has been miminal for many years, this has had a great impact not only on the Ranching communities but as well as mining projects.

P-3 American Indian Cultural and Natural Resources are abundant and historically, there have been incidents recorded by archaeology that indicate that there are area's significant to the history, culture and belief's of the American Indian, which is to state, that there must be valid and genuine discussions developed with the American Indian Tribe that is associated with the area in question.

Present day location of an American Indian Tribe often is not viewed with respect to past association with area's being established for projects and or certain activity that has impacts to land, water, cultural and natural resources, this is not only reckless but is insignificant and can lead to critical removal of Traces of the Past, which is why it is imperative for direct contact with the American Indian Tribe that has a past history with the area.

P-4 Wildlife and Wildlife Habitat must be preserved and protected with utmost concern. In the past, areas vital for survival for Wildlife have been pushed aside, or so it seems and this type of action is no longer acceptable in that a serious portion of Wildlife Habitat is distorted and destroyed that also has a critial impact on the lives of Wildlife.

P-5 The environment is serious business, more so such is the preservation and protection of the environment and every feasible effort must be made to address all concerns, interest and issues.

P-6 The Bureau of Land Management must not make invalid excuses to further distort, destroy or desecrate areas for any project, but must provide the General Public with direct and sincere "Facts." Thank you.

Sincerely,
Larry Kibby
Elko Indian Colony
1581 Pinenut Circle
Elko, Nevada 89801

(775) 738-4147

Response No. P-1: *Statement noted.*

Response No. P-2: *Range resources have been addressed in Section 3.10.2 of the FEIS. With the implementation of the Proposed Action, 98 AUMs would be lost. This loss would be temporary as once reclamation has been completed, these areas would be available for grazing again and provide vegetation more suitable for grazing. A permanent loss of 13.5 AUMs would result from the construction of pits and pit berms that would not be reclaimed. Drought and Fires were addressed as interrelated projects in Table 4-2.*

Response No P-3: *Consultation has been conducted and is ongoing with several tribes in the area of the Proposed Action. This consultation is discussed in Section 3.20.*

Response No. P-4: *Potential project impacts on wildlife and wildlife habitats are discussed in Section 3.8.2.*

Response No. P-5: *Statement noted.*

Response No. P-6: *Statement noted.*

Q

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

March 23, 2009

John F. Ruhs, Manager
Ely District Office
Bureau of Land Management
HC33 Box 33500
Ely, NV 89301

Subject: Draft Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project, White Pine County, Nevada [CEQ # 20080518]

Dear Mr. Ruhs:

The U.S. Environmental Protection Agency (EPA) has reviewed the above referenced document. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) NEPA Implementation Regulations at 40 CFR 1500-1508, and our NEPA review authority under Section 309 of the Clean Air Act. We appreciate the extensions BLM has granted us on the comment due date for this Draft Environmental Impact Statement (EIS).

EPA has rated this Draft EIS as EO-2 – Environmental Objections - Insufficient Information (see enclosed "Summary of Rating Definitions and Follow-Up Action"). The proposed project would expand and combine the existing Bald Mountain and Mooney Basin gold mines into one project area to be administered under one Plan of Operation called North Operations Area. Our rating is based on indications, from the limited geochemical characterization in the Draft EIS, that waste rock from several pits could generate leachate with high concentrations of metals and metalloids, and degrade water quality if the leachate should reach groundwater or surface waters, or if pit lakes would form. Such significant impacts must be avoided in order to provide adequate protection for the environment. We also have concerns regarding the project's potential impacts to air quality, and potential impacts associated with a lack of suitable soil for reclamation. The Draft EIS does not contain sufficient information for us to fully assess the environmental impacts that should be avoided in order to fully protect the environment. We recommend the Final EIS include additional information regarding geochemical characterization of waste rock, potential impacts to water and air resources, mitigation and monitoring, and closure and reclamation.

In addition to the proposed action, the Draft EIS evaluates the Partial Backfill Alternative (Alternative A), the Mooney Basin Heap Leach Pad Alternative

(Alternative B), and No Action. Relative to the proposed action, BLM's preferred alternative, Alternative A, would significantly reduce the disturbance footprint of several waste rock disposal areas. If a pit lake would form in the Top Pit and cause an adverse ecological risk or degradation of adjacent groundwater, EPA recommends that Alternative A also include backfilling of the Top Pit to preclude the formation of a pit lake. In addition, it appears from the Draft EIS that combining Alternative B with Alternative A would further reduce the disturbance footprint. EPA recommends BLM consider combining these two alternatives to benefit resources in the project area. Furthermore, we recommend that BLM evaluate a conveyor alternative in more detail and consider incorporating this into the project if resources would be better conserved and/or protected. Our detailed comments are enclosed.

We appreciate the opportunity to review this Draft EIS, and request a copy of the Final EIS when it is filed with our Washington, D.C. office. If you have any questions, please call me at (415) 972-3843, or have your staff contact Jeanne Geselbracht at (415) 972-3853.

Sincerely,

Kathleen M. Goforth

for Enrique Manzanilla, Director
Communities and Ecosystems Division

004963

Enclosures: EPA's Summary of Rating Definitions and Follow-Up Action
EPA's Detailed Comments

Cc: David Gaskin, Nevada Division of Environmental Protection
Christine Hansen, U.S. Army Corps of Engineers, Reno

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

Bald Mountain Mine North Operations Area Draft EIS
EPA Comments – March, 2009

Water Resources

Water Quality Impacts

The Draft EIS (p. 3-33) states that the waste rock would not leach waters that are high in acidity or metals content. However, neither the Draft EIS nor the *Baseline Geochemical Assessment for the Proposed Bald Mountain Mine North Operations Area Expansion* (Schafer, 2008) referenced in the Draft EIS provides sufficient information regarding waste rock geochemistry to support this conclusion. In addition, some information in the Draft EIS appears to contradict it.

Q-1

For example, the Draft EIS (p. 3-15) states that there would be no impacts to surface water quality from the Top Pit waste rock. However, Meteoric Water Mobility Procedure (MWMP) results in Appendix D indicate that numerous Top Pit samples exceeded water quality standards for several metals and metalloids, and two samples were above 10 times the drinking water standard for mercury. In addition, several samples from the Bida Pit also exceeded water quality standards for several metals. One sample exceeded the mercury drinking water standard by 40 times, and one sample exceeded the copper aquatic life standard by 80 times. Some Saga pit samples also exceeded water quality standards, and nickel exceeded the drinking water standard by more than 20 times in one sample. Some samples from these pits also indicate some potential for acid generation. However, the Draft EIS does not provide mass balance information for each pit and waste rock disposal area to indicate whether there is sufficient acid neutralizing material in each of these areas to adequately neutralize and isolate any acid generating waste rock. The waste rock dumps must be properly designed to prevent generation of leachate, but it is unclear how this will be accomplished.

Recommendation: The Final EIS should describe how the waste rock dumps will be designed to prevent generation of leachate that could degrade surface water or groundwater quality. (See also our comment on appropriate growth medium below). Individual plans should be specifically developed for waste rock from those pits with higher potential for acid generation and metals leaching. The Final EIS should specify how and where waste rock from these pits would be
Q-1 disposed, specify the acid neutralization potential the surrounding waste rock would need to meet for this purpose, and clarify whether sufficient neutralizing material would be available when it would be needed for this purpose. The Final EIS should also describe how waste rock facilities would be designed to ensure against leaching of contaminants that are mobile under non-acidic conditions.

Recommendation: The Final EIS should include a map showing the location of pits and waste rock facilities (indicating areas with higher contaminant leaching potential) and intermittent streams and areas with shallow groundwater.

Q-1 **Recommendation:** The Final EIS should describe all surface water and groundwater monitoring that would be required for this project, as well as mitigation measures that would be implemented if water quality is degraded.

The Draft EIS (2-33) states that the open pits would not encounter the deeper groundwater aquifer because the current pit configurations lie above the potentiometric surface. However, the 7000-foot potentiometric surface appears to bisect the Top Pit, which would be excavated to an elevation of 6,500 feet above mean sea level (Draft EIS, Table 2-6). It appears, therefore, that a deep pit lake would form here. Test results from a number of Top Pit samples indicated low neutralization potential and generated leachate with high concentrations of arsenic, mercury, nickel, zinc, and other pollutants.

Q-2

Recommendation: The Final EIS should provide a detailed discussion, including an ecological risk assessment, regarding the potential for, and impacts of, a post-mining pit lake in the Top Pit. The discussion should address the chemistry of Top Pit wall rock and how it would affect pit water quality. The Final EIS should identify measures to mitigate all potential adverse impacts of a pit lake in the Top Pit. If a pit lake would potentially adversely affect biological resources, EPA recommends the FEIS thoroughly evaluate an alternative that involves backfilling the pit with appropriate waste rock to preclude the formation of a pit lake. The discussion should identify waste rock specifications (e.g., geochemistry, amount, depth, cap/cover) for backfilling and justify such specifications.

Recommendation: The Final EIS should discuss whether pit water would flow through the pit into adjacent groundwater. If pit water would degrade groundwater, the Final EIS should describe how groundwater would be affected, and identify effective mitigation measures.

The potentiometric surface (7,000 to 7,500 feet above mean sea level) also appears to bisect the Sage Flat Pit, which would be excavated to an elevation of 7,150 feet above mean sea level. This pit would be backfilled under Alternative A. However, it is unclear from the Draft EIS whether it would be backfilled to above the potentiometric surface, precluding pit lake formation.

Q-3

Recommendation: The Final EIS should provide the specifications for backfilling the Sage Flat Pit and indicate whether a post-mining pit lake is expected to form above the backfill. If so, the Final EIS should provide a detailed discussion, including an ecological risk assessment, regarding the impacts of a pit lake in the Sage Flat Pit. The discussion should address the chemistry of Sage Flat Pit wall rock, how it would affect pit water quality, and whether water would flow through the pit into groundwater. If pit water would affect groundwater, the Final EIS should describe how groundwater would be affected and how impacts would be mitigated. If a pit lake would potentially adversely affect biological resources, EPA recommends the Final EIS thoroughly evaluate backfilling the pit to preclude the formation of a pit lake.

Geochemical Characterization

The Draft EIS and Schafer (2008) provide limited information on geochemistry within the project area. No mineralogic information is presented, which causes uncertainty about the acid generating potential (AGP) and acid neutralizing potential (ANP) of the material. Furthermore, the mineralogic sources of contaminants of concern, including arsenic, antimony, copper, and zinc, are unknown. Additional information is needed to more reliably predict the long-term leaching ability of the mined materials. There may be relationships between the results of kinetic tests, acid-base accounting (ABA) tests, MWMP, and whole rock analysis that could help establish methods for easily identifying high contaminant leaching materials in the field. However, several questions exist regarding geochemical characterization of the waste rock, which need to be answered before these relationships can be identified.

Q-4

Kinetic Tests. The results of the ABA testing (Schafer, 2008, Appendix B) suggest that the vast majority of samples have high neutralizing ability and low acid generation potential. However, the kinetic testing was conducted on samples within only a narrow range of ABA values, so the long-term leaching ability of all rock types or geochemical test units is unknown. Only three composite samples were subjected to kinetic testing, and the tests lasted for only 20 weeks. Samples with both low ANP and low AGP can take substantially longer to generate acid than rocks with more moderate ANP and AGP values. Very low amounts of sulfate were released compared to the amount of pyritic sulfur in the samples (Schafer, 2008, p. 29). This result demonstrates that much more acid generation could have occurred if the samples had been run for longer than 20 weeks. Longer kinetic testing would help determine the longer-term leaching ability of contaminants of concern and the longer-term acid-generation potential of mined materials at the project site. The results of the kinetic tests are also not addressed in the Draft EIS.

> **Recommendation:** Kinetic tests should be run on the full range of rock types and ANP:AGP ratios in the project area. Tests may need to be run for one year or longer. Concentrations of contaminants of concern should be measured to assess the long-term ability of the materials to produce acid and leach contaminants. This information should be used to verify and update the relationships between the results of kinetic tests, ABA tests, MWMP, and whole rock analysis to establish more reliable methods for easily identifying high contaminant leaching materials in the field.

Q-5

ABA Tests. It appears that Schafer (2008) used the modified Sobek method for calculation of AGP. However, it is unclear whether the modified Sobek or the original Sobek method was used for determination of ANP. If the original Sobek method was used, the neutralization potential is likely overestimated. The exact method used to calculate ANP needs to be clarified. In either case, the mineralogic basis for the ANP was not evaluated. In addition, Schafer (2008) usually presented the ABA results in terms of net neutralization potential (NNP) rather than ANP:AGP ratios. ANP:AGP ratios are preferred because they apply over a wider range of values. In addition, Schafer (2008) used the Net Carbonate Value (NCV) test to assess acid-generation potential, but did not conduct NCV and Sobek methods on any of the same samples to determine whether the conversion factor used was appropriate.

Q-5

Schafer (2008, p. 13) states that the NCV results showed that of the 1,547 samples tested, 51 had NNP values less than 0, and 55 had ANP/AGP ratio less than 1.2:1. It is unclear why BLM standard categories for NNP and ANP/AGP screening were not used (i.e., uncertain range for NNP is –20 to +20 kg/t as $CaCO_3$, and for ANP:AGP ratio is 1:1 to 3:1). Using the too-low cutoff values, 28.5% of the Saga waste rock had low NNP (Schafer, 2008, p. 13). If more appropriate cutoff values were used for net neutralizing material, for example, a higher percentage of the Saga material would be considered potentially acid-generating than is estimated in the Draft EIS.

> **Recommendation:** The Final EIS and Schafer report should clarify the method used to calculate neutralization potential. If the modified Sobek method was not used, the values for ANP and NNP are likely overestimated, and the AGP is higher than reported. The ABA results (using the Sobek method) should also be presented in ANP:AGP ratios. A number of split samples should be subjected to both the Sobek (modified for ANP calculation) and NCV tests to determine whether application of the conversion factor between Sobek and NCV results is valid.

MWMP. Results from the MWMP tests showed that a number of samples leached elevated concentrations of arsenic, antimony, and mercury under neutral pH conditions. MWMP results also showed that metals that were less enriched (such as copper, zinc, and sometimes lead) were more mobile than the results of the whole rock analysis might suggest (DEIS, Appendix D; Schafer, 2008, Appendix B). Schafer (2008) states that the
6 mobility of metals is low at Bald Mountain because of the low rainfall, pervasive alkaline conditions, and the abundance of iron, which can adsorb oxyanions such as arsenic and antimony (p. 22). However, the results from the MWMP and kinetic tests (Schafer, 2008, Appendices B and C) show that iron leachate values are low, with many values below detection and very few values above 1 mg/L. Therefore, iron may not provide much adsorption capability. There seems to be very little relationship between the ABA results and the MWMP metal/metalloid values. Therefore, the results from static ABA testing may not provide a good indication of the contaminant leaching potential and the need for special handling for this part of the project.

Whole Rock Analysis. The results from the whole rock analysis and MWMP tests show that all rock types are especially enriched in arsenic, antimony, and mercury, all of which can easily leach under neutral pH conditions, and that metals such as copper, zinc, and lead can be mobile and at high concentrations in certain areas. Saga and Top areas have higher concentrations of arsenic, antimony, and mercury than other areas. For example, approximately 50% of the samples from these pit areas had mercury concentrations above 1 mg/kg, and concentrations reached as high as 10 to 50 mg/kg (background or unenriched values are ~0.07 to 0.35 mg/kg for all rock types) (Schafer, 2008, p. 26). Carbonates were highly enriched in antimony (over 100 times higher than background values); arsenic, tellurium, cobalt, mercury, thallium (between 10 and 99 times higher than background); and somewhat enriched in elements such as niobium, selenium, and copper (two to ten times higher than background) (Schafer, 2008, Figure 21 and Appendix B). Clastic rocks were highly enriched in antimony (1,000 times background), highly enriched in arsenic (almost 300 times background), and somewhat enriched in cobalt, mercury, and nickel (between three and 10 times background) (Schafer, 2008, Figure 23 and Appendix B). Elements enriched in intrusive rocks included arsenic and antimony (over 100 times background), selenium, tellurium (between 10 and 100 times background), and mercury and thallium (between two and 10 times background) (Schafer, 2008, Figure 25 and Appendix B).

Q-6

Recommendation: The Final EIS should include additional geochemical analysis on the mineralogy of the mined material, the availability of acid-generating and acid-neutralizing minerals, and the material's ability to leach contaminants. The percent of calcite, dolomite, and siderite should be determined in samples from all waste rock and pit locations (or geochemical test units). All test data should be made available electronically (e.g., in Excel or Access), and relationships between leachate concentrations and ABA, sulfide, or other measurements made easily in the field should be evaluated.

Recommendation: The Final EIS should include a map and cross-sections depicting the locations of static and/or kinetic test samples, and should describe and discuss the extent to which they are representative of the pits and proposed pit expansion areas. The Final EIS should provide a more detailed characterization of waste rock geochemistry, including a mass balance of waste rock from each pit and existing waste rock dump identifying how much is potentially acid generating, potentially acid neutralizing, or inert.

<u>Existing Water Resources</u>

According to the Draft EIS (3-13), most springs in the area meet Nevada water quality standards with the exception of arsenic, which exceeds standards in most springs. The Draft EIS (3-28) presents data from 2005 through 2007 to demonstrate background arsenic values in various groundwater monitoring wells. However, neither referenced water quality data from 1994 and 1995 nor earlier (1980's) data are not provided as a comparison to the 2005 to 2007 data to verify that impacts are not the result of mining.

Q-7

Recommendation: The Final EIS should provide earlier monitoring data to substantiate that present background arsenic concentrations were not caused by previous mining activities. Similarly, other potential contaminants (e.g. antimony, mercury, selenium, nitrates) should be evaluated comparing early data with more current data to demonstrate whether or not impacts from previous mining have occurred.

Q-8 According to the Draft EIS (3-33), impacts to groundwater quality as a result of the proposed action are not anticipated, based on no detected impacts under the current operations. Schafer (2008) also notes that seepage or flow has not been observed from the existing waste rock dumps since inception of operations in the early 1980's. However, data are insufficient to support this conclusion because efforts have not been made to detect and monitor waste rock seepage beyond that of visual observations.

In addition, the Draft EIS (3-16) states that Cherry Spring has recently exhibited water levels well below ground surface although there was flow in the past, and the current water level and cause of the decrease are not known at this time. The proposed project would cover 65.1 acres of the 130.5 acre recharge area for Cherry Spring.

Q-8

Recommendation: The Final EIS should provide and evaluate all water monitoring data for the entire mine area to distinguish baseline conditions versus any water quality and quantity impacts from mining thus far. A map should be provided showing the monitoring locations, and trend analysis should be conducted. The adequacy of the existing monitoring system to detect leachate and impacts to water resources should be evaluated and modified as necessary, and this should be addressed in the Final EIS. Additional leachate collection features may be needed, for example at the toe of rock disposal areas, along with additional surface water/stormwater and groundwater monitoring in drainages potentially affected by those areas.

Q-9

With the exception of Cherry Spring, it is difficult to discern the juxtaposition of water resources and mine facilities in the Draft EIS. A map that depicts existing and proposed mine facilities, including run-on/run-off channels and diversions, and water resources as they would look before, during, and after the proposed mining operations would facilitate an understanding of the various alternatives' potential impacts to water resources.

Recommendation: The Final EIS should include a large-scale map that includes existing and proposed mine facilities as well as water resources as they would look before, during, and after the proposed mining operations.

Q-10

Clean Water Act Section 404

The Draft EIS (p. 3-3) indicates there may be no waters of the U.S. in the project area, and a survey of surface waters in the area has been submitted to the U.S. Army Corps of Engineers for concurrence and approval.

Recommendation: The Final EIS should provide the results of the U.S. Army Corps of Engineers' jurisdictional delineation for the project site.

Q-11

If it is determined that there are jurisdictional waters within the project area, a Clean Water Act (CWA) Section 404 permit will be necessary for any discharges of dredged or fill material into these waters, including wetlands and other special aquatic sites, and EPA will review the project for compliance with *Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials* (40 CFR 230), promulgated pursuant to Section 404(b)(1) of the CWA. Any permitted discharge into waters must be the Least

Environmentally Damaging Practicable Alternative available to achieve the project purpose.

Q-11 **Recommendation:** If, under the proposed project, dredged or fill material would be discharged into waters of the U.S., the Final EIS should discuss alternatives to avoid those discharges and demonstrate the project's compliance with the 404(b)(1) Guidelines. In addition, the Final EIS should identify and commit to any required mitigation for impacts to waters of the U.S.

Soil Resources

Q-12 The Draft EIS (p. 3-51) indicates that approximately 7.7 to 12.8 million cubic yards of growth medium would be available for salvage from the 3,920 acres of proposed disturbance. The document also indicates, however, that 91 percent of the proposed action area contains soil associations that are not suitable for growth medium. It is unclear how much suitable and highly suitable soil will be available for reclamation, how much additional soil amendment may be needed to improve growth medium to a suitable condition, where additional soil amendment would be obtained if needed, and the impacts associated with using this additional material (e.g., borrow area locations and acreages, etc.).

Recommendation: The Final EIS should clarify how much suitable and highly suitable soil will be available for reclamation and how much additional soil amendment may be needed to improve growth medium to a suitable condition, as well as identify where additional soil amendment would be obtained if needed.

Q-13 Although evaporation and transpiration can be employed with the goal of zero-discharge, it is difficult to achieve this if the appropriate amount and type of cover and growth medium are not used. The Draft EIS indicates that 6 to 12 inches of growth medium would be placed on facilities during reclamation. It is unclear that this is an adequate thickness for a cover that would not only accommodate successful revegetation, but act as a store-and-release cover as well. In light of the geochemistry data provided in Appendix D, it appears meteoric water should be precluded from infiltrating waste rock dumps and leach pads to the extent possible.

Recommendation: The Final EIS should discuss how the appropriate thickness of growth medium was determined and whether it will effectively preclude meteoric water from infiltrating waste rock dumps and leach pads. We recommend growth medium be of sufficient thickness to accomplish this. The Final EIS should identify how much growth medium will be needed for this purpose and discuss whether it will be available.

Air Resources

Mercury Emissions Controls

Q-14 Table 3-19 in the Draft EIS (p.3-122) identifies existing mercury emissions controls for each thermal unit at the mine, as well as the proposed Nevada Maximum Achievable Control Technology (NvMACT) for mercury for these thermal units. The Draft EIS states that installation of these NvMACT controls would reduce mercury emissions from 57.4 pounds/year to 14.2 pounds/year. Fugitive sources at the mine would also contribute 0.27 pounds/year. In a discussion of unavoidable adverse impacts on page 3-165, the Draft EIS states that these fugitive and thermal sources at the mine would emit 57.7 pounds/year of mercury. It is unclear when the identified controls would be installed and the estimated 43.2 pounds/year reduction would be realized.

Recommendation: The Final EIS should indicate when the additional mercury controls would be installed and the estimated mercury reductions realized.

Particulate Emissions Mitigation Measures

Q-15 The Draft EIS provides direct and indirect criteria air pollutant emissions estimates associated with the mine. We recommend BLM consider including measures to reduce emissions of diesel particulate matter (DPM) from fugitive sources at the mine.

Recommendation: We recommend the following DPM emission reduction measures.

- Use particle traps and other appropriate controls to reduce emissions of DPM and other air pollutants. Traps control approximately 80 percent of DPM, and specialized catalytic converters (oxidation catalysts) control approximately 20 percent of DPM, 40 percent of carbon monoxide emissions, and 50 percent of hydrocarbon emissions;
- Use diesel fuel with a sulfur content of 15 parts per million or less, or other suitable alternative fuel, which substantially reduces DPM emissions. This standard will be required after June 2010. (See http://www.clean-diesel.org/nonroad.html);
- Minimize construction-related trips of workers and equipment, including trucks and heavy equipment;
- Lease or buy newer, cleaner equipment (1996 or newer model);
- Employ periodic, unscheduled inspections to ensure that construction equipment is properly maintained at all times and does not unnecessarily idle, is tuned to manufacturer's specifications, and is not modified to increase horsepower except in accordance with established specifications.

Closure, Reclamation and Post-Closure

Q-16 According to the Draft EIS (p. 2-19), post-closure fluid monitoring would continue for a minimum of five years for each closed component. However, the Draft EIS (p. 2-49) also states the period needed to manage draindown solutions ranges from several years to 20 years. While it is helpful to know the minimum monitoring requirements, it is most important to determine the maximum requirements for the purpose of determining long-term treatment; corresponding operations, maintenance, and monitoring requirements; and respective bonding.

> **Recommendation:** EPA believes a conservative approach to long-term requirements should be adopted by BLM. This would include requirements for monitoring and treatment as necessary as long as draindown solutions or leachate is discharged, and would assume this is required for up to 20 years for the purposes of closure planning and bond determination.

Q-17 According to the Draft EIS (pp. 2-49, 2-50), information from the site closure studies of five closed heaps within the mining district has been used to determine that the heaps can be safely closed. At four of the five mines, this included vadose zone infiltration systems for residual drain down solutions, and this approach appears to be intended for closure of the existing and proposed leach pads. The Draft EIS indicates that the ore and waste rock that would be excavated under the proposed project are similar to material currently being mined. Therefore, it should be feasible to make a reasonable prediction of the residual heap leach draindown chemistry now, rather than waiting until two years before heap closure.

> **Recommendation:** The Final EIS should provide a reference for information on leach pad closures in the district and make it available for evaluation. The Final EIS should also provide a detailed description of the subsurface in the vicinity of the Bald Mountain and Mooney Basin leach pads and discuss the predicted interactions of residual draindown in the subsurface.

Q-18 It is unclear from the Draft EIS what post-operation surveillance would be required to ensure that neutralization and/or stabilization of mining waste sites has been effective.

> **Recommendation:** We recommend that the Final EIS discuss commitments for post-operation surveillance to ensure that neutralization and/or stabilization of mining waste sites has been effective. Describe the mitigation actions that would be taken should destabilization or contamination be detected, and identify who would be responsible for these actions.

Q-19 The EIS provides the public the opportunity to weigh in on the adequacy of the bond amount. The viability of the bond can be a critical factor in whether or not a project is environmentally acceptable. Therefore, this information should be disclosed in the EIS.

Q-19 **Recommendation:** The Final EIS should identify the bond amounts for each closure and reclamation activity at all of the proposed project facilities. Identify who would be responsible for any post-closure cleanup actions should they be necessary.

The Draft EIS does not discuss whether long-term post-closure operations and maintenance or monitoring may be necessary for this project.

Q-20 **Recommendation:** The Final EIS should discuss whether long-term post-closure operations and maintenance or monitoring may be necessary, describe these activities, indicate the projected costs for these activities, and discuss any requirements BLM would impose on the mine operator to establish a trust fund or other funding mechanism to ensure post-closure care, in accordance with 43 CFR 3809.552(c). The financial assurance necessary to fund post-closure activities must be kept current as conditions change at the mine, and BLM should ensure that the form of the financial assurance does not depend on the continued financial health of the mine operator or its parent corporation. If a trust fund would be needed, the Final EIS should include a general description of the trust fund. The mechanics of the fund are critical to determining whether sufficient funds would be available to implement the post-closure plan and reduce the possibility of long-term contamination problems.

__Project Alternatives__

Q-21 Relative to the proposed action, BLM's preferred alternative, Alternative A, would significantly reduce the disturbance footprint of several waste rock disposal areas. It appears from the Draft EIS that combining Alternative B with Alternative A would further reduce the disturbance footprint, which would result in the disturbance of fewer acres of pristine habitat in the Mooney Basin.

Recommendation: EPA recommends BLM consider selecting a combination of Alternatives A and B as its preferred alternative to benefit resources in the project area.

Q-22 The Draft EIS (p. 2-69) states that conveyors to transport ore were eliminated from further analysis because the disturbance from conveyors would be the same as, or greater than, the disturbance from the Proposed Action and, therefore, conveyors offer no additional benefit. We do not believe the short discussion in the Draft EIS supports this conclusion. For example, it is unclear why maintenance roads along the conveyors would disturb as many acres as mining haul roads. In addition, the Draft EIS does not evaluate nor compare the energy use and air emissions of haul roads versus conveyors. This information is needed to determine if incorporating this alternative into the project would further reduce resource impacts.

Q-22 **Recommendation:** The Final EIS should describe acreages that would be needed for maintenance roads along conveyors and compare them to acreages of haul roads the conveyors would replace. A map depicting the conveyors and the roads they would replace would be useful. The Final EIS should also estimate and compare the energy consumption and air pollutant emissions, including greenhouse gas emissions, associated with using haul roads versus conveyors to transport ore to processing facilities. If resources would be better conserved and/or protected with a conveyor alternative, we recommend BLM consider incorporating this into the project.

Q-23 The differences between leach pad configurations and sizes under the proposed alternative and Alternative B are not discernable from the maps in Chapter 2 of the Draft EIS.

Recommendation: The Final EIS should clarify how the leach pads would be reconfigured and downsized under Alternative B.

Response No. Q-1: *An addendum to the Baseline Geochemistry Report (Schafer, 2009)(available in the Administrative Project File) has been prepared which includes additional information regarding the potential for the various materials to produce acid or leach metals. The additional testing focused on the pit areas that showed the potential for acid generation during the previous testing. These areas include the Saga and Bida pits. The results of the subsequent testing showed results very similar to results obtained in previous sampling and analysis. The estimated average net neutralizing potential for the LJ Ridge, North Pit 1 through 3, Rat, and Top/Sage pits at BMM were shown to range from 365.4 to 720.6 kilograms per ton as calcium carbonate. Based on this data and analysis, there is little risk acidic conditions would form within the rock disposal areas for these pits particularly when utilizing the comingled rock placement currently in place at the mine that results in mixing alkaline limestone and dolomite with rocks containing higher sulfide content. However, upon reviewing these concerns, additional measures have been added to the plan of operations and reclamation plan to assure that the potential for environmental impacts from acid generation will be minimized. Description of reclamation, closure, and monitoring are in Section 2.3.14 of the FEIS. Post reclamation topography is shown on Figure 2-13 of the FEIS and monitoring locations are shown on Figure 2-12 of the FEIS. A specific waste rock sampling and blending program at the Saga and Bida pits will include the following measures:*

- *The waste rock will be sampled from the drill blast holes. The samples will be tested for acid generating potential and acid neutralizing potential using the net carbonate value method.*

- *Any waste rock with net neutralization potential values less than 0 kilogram per ton will be considered to be potentially acid generating and will be segregated and routed to the rock disposal area for blending with non-potentially acid generating material.*

- *The test results and the waste rock tonnages requiring special handling and blending will be reported to BLM and Nevada Division of Environmental Protection on a quarterly basis.*

In addition, an evaluation of the mass balance of waste rock amounts and average net neutralizing potential values has been conducted and is included in the FEIS (Table 3-2). The information from this analysis shows that while some of the individual formations may have low net neutralizing potential values, they are greatly outweighed by the limestone materials that are also available. The net neutralizing potential values for the pits of concern (Saga and Bida) average between 150 and 200 kilograms per ton. The pits also have acid neutralizing potential:acid generating potential ratios which greatly exceed the 3:1 ratio of concern recommended by the BLM.

The comment also identifies concerns about leaching of metals from the Saga, Bida and Top rock disposal area's under neutral conditions. The available data and analyses indicate that the potential for impacts from metals leaching is small because of several factors that serve to limit or minimize mobilization of metals within the rock disposal areas. These factors include placement of topsoil covers and revegetation during closure to reduce net infiltration of meteoric water, neutralization of acidity along flow pathways in the rock disposal areas, formation of secondary precipitates along flow pathways that will reduce iron, aluminum and base metal mobility in the rock disposal areas, underlying unconsolidated sediments and bedrock having large neutralization and attenuation capacity and sorption and other attenuation mechanisms *that will reduce mobility of arsenic, antimony, mercury and other soluble base metals along flow pathways in the rock disposal areas.*

While the potential for impacts is expected to be small, additional measures have been incorporated into the plan of operations and reclamation plan to further reduce potential impacts from leaching of metals. The measures include:

- *The reclamation plans for the Saga, Bida and Top rock disposal area's have been modified so that there will be no large, flat surfaces on the tops of the facilities that would allow water to pond after reclamation and closure. The revised reclamation plan will require adequate placement of material at closure so that the top of each rock disposal area will be "rounded" to promote surface runoff from the top of the rock disposal area.*

- *After final grading of the Saga and Bida rock disposal area's during reclamation, there will be 6 to 12-inchs growth media (depending on availability) cover placed on the rock disposal areas prior to seeding with the approved BLM seed mixture. This soil/vegetative cover will reduce the infiltration of meteoric water and enhance evapotranspiration.*

- *The side slopes of the Saga, Bida and Top rock disposal area's will be modified to steepen the slope angles to a nominal 2.5 horizontal to 1 vertical. This change will reduce the residence time of water on the rock disposal area face and increase the run-off rate, further reducing the potential for infiltration.*

- *The engineering design for the drainage channel network for the Saga, Bida and Top rock disposal area's will be modified to account for the slightly higher flow rates resulting from the steepening of the side slopes and to prevent erosion.*

Response No. Q-2: *The potentiometric map provided in the DEIS was incorrect. A corrected map is provided as Figure 3-4 in the FEIS. The original potentiometric maps were prepared electronically using data that was given a weighted importance based on the assumed validity of the water level information. Exploration drilling has always indicated these pits would be dry. Additional borehole data produced a contour map which more accurately represents the conditions at the Proposed Action. The corrected map shows that the water table is located below both the Top and Sage Flat pits. Neither the proposed action nor BLM's preferred alternative is expected to intersect the water table in either pit.*

Response No. Q-3: *See Response Q-2.*

Response No. Q-4*: The composition of the geologic materials at BMM is discussed in Section 3.3 and shown on Figure 3-7. The rock in the Top, LJ Ridge, North Pits 1 through 3, and Rat Pit areas include minerals formed from circulation of low-sulfur, reduced hydrothermal fluids associated with the emplacement of the Bald Mountain pluton. The mineralization occurs in zones around the contact area, which is centered on the Top Pit area. The Saga and Bida pit areas were mineralized later with silica- and pyrite-rich fluids. The gold mineralization in this area is confined to favorable strata, especially the Pilot Shale.*

Whole rock analysis has also been completed as part of the Schafer (2009) report (available in the Administrative Project File). The analyses utilized the whole rock analyses as a surrogate *for estimating acid neutralizing potential. If neutralization capacity is purely dependent upon calcite and dolomite, the acid neutralizing potential values should correlate with the total calcium and magnesium in the rock. The correlation worked well for younger and less altered materials. For rocks that were highly altered, the surrogate acid neutralizing potential method overestimated the acid neutralizing potential values. It is assumed this is due to the calcium and magnesium being altered to skarns and hornfels where some of the original calcite and dolomite have been converted to other minerals.*

The kinetic testing program was based on the results of the static tests and focused on the lower Net Neutralizing Potential material. The kinetic program was developed in accordance with BLM's Acid Rock Drainage Policy. Results from the kinetic tests indicate that the rate of sulfur oxidation is low with low levels of sulfate and some metals observed. This supports the conclusion in the FEIS that acid generation from these rock disposal areas is not expected due to the effects of mixing alkaline rock from the Guilemette formation, slow sulfide reactivity, and hydrologic and climatic factors that minimize the movement of water into and through the RDA's. The additional measures added to the Plan of Operations and Reclamation Plan, as described in responses Q1 and Q2, will further reduce the potential of acid generation from the rock disposal areas.

There are currently six ongoing kinetic tests from the following four borehole samples and two quarterly composites: SG-1054 (195-220 feet), SG-1054 (355-380 feet), SG-1009 (50-100 feet), SG-1043 (40-80 feet), B3WF_INT_OX (1st quarter 2009), and SWF_SED_OX (1st quarter 2009). In response to the comment, these kinetic tests will be continued for a total of 52 weeks. Additional data from the extended tests will be evaluated.

***Response No. Q-5**: A detailed comparison of the modified Sobek method and the net carbonate method has been included in Schafer (2009) (available in the Administrative Project File). The Sobek test employed boiling nitric acid to improve the efficiency of the sulfide digestion. No change in the Sobek acid neutralizing potential method was used. The acid neutralizing potential for the net carbonate value static test is based on LECO carbon determined in raw samples and samples digested with hydrochloric acid to remove carbonate minerals. The acid neutralizing potential is therefore distinguishing carbonate minerals in all but the most altered rocks. The two methods (Sobek and net carbonate value) correlated very strongly with an r^2 value of 0.99.*

The acid neutralizing potential:acid generating potential ratios have been added to Section 3.2.2 of the FEIS for the waste rock material balance discussion. A kinetic test indicated that while samples with very low net neutralizing potential (<-20 kilograms per ton) might form acid, most samples in the range of net neutralizing potential between -20 and +20 kilograms per ton did not form acid. As a result, a net neutralizing potential value of 0 (neutralizing potential ratio=1) was utilized as the potentially acid generating cutoff. Use of different potentially acid generating criteria does not have a large effect on the calculated potentially acid generating abundance in BMM samples. Increasing the neutralizing potential ratio from 1.0 to 1.2 or 3.0 increases potentially acid generating abundance by 0.25% and 2.55%, respectively. If a net neutralizing potential of +20 kilograms per ton was used, the PAG abundance would increase from 3.26% (for net neutralizing potential=0) to 9.96%. Humidity cell tests suggest that a potentially acid generating cutoff of net neutralizing potential=0 is conservative because samples with negative net neutralizing potential did not become acid or release sulfate in kinetic tests.

Response No. Q-6: *Arsenic and antimony are not anticipated to have high mobility. The previous column analyses at the Little Bald Mountain Mine, arsenic, antimony, and mercury were sorbed onto soils located near the leach pad. Iron is not anticipated to leach since iron is relatively insoluble under oxidizing conditions with neutral to alkaline pH. The immobility of the iron also makes it an effective sorbent for arsenic and antimony. Under neutral-oxidizing conditions, iron oxide compounds will persist and provide attenuation capacity. Iron has been shown to be present in soils, sediments and bedrock underlying the rock disposal areas.*

While the whole rock analyses indicate elevated arsenic, antimony, and lead, it is important to remember that elemental abundance in whole rock assays seldom correlate well with soluble levels, which are highly dependent upon pH. The neutral to alkaline conditions occurring at Bald Mountain would reduce the mobility of these elements.

A detailed description of the mineralogy of the Bald Mountain area is provided in Shafer (2009). The BLM and Nevada Division of Environmental Protection both receive copies of waste rock analyses as part of the existing (and future) Water Pollution Control Permits to include acid base accounting, Meteoric Water Mobility Procedure and sulfur speciation test results.

The borehole sample locations are shown on Figures 2-3, 2-4, 2-5, and 2-6. Static and kinetic test results from previous Bald Mountain mining areas are representative for the FEIS because the proposed mine expansion areas are all within the same rock formations that have been mined previously. This is discussed and shown in Sections 2.3.3 and 2.3.4 of the FEIS. Reclamation and closure including closure monitoring, are described in Section 2.3.14 of the FEIS.

Response No. Q-7*: Samples from the 1980s were sampled for major ions and general chemistry. Metals were not analyzed at that time. The samples obtained in 1994, as part of the previous EIS in 1995, included metals analyses. All available sampling data has been included in the FEIS. Although there are no metals data from the 1980s, examination of the data presented in Table 3-1 shows no significant differences to concentrations of the major ions in the local springs.*

Response No. Q-8: *BMM plans the installation of additional monitoring wells to track groundwater quality throughout the life of the mine and post-closure period to determine the presence or absence of changes to the groundwater. There are eight additional groundwater monitoring locations proposed at this time. These locations include three near the Mooney Leach Pad, two near the toe of the Sage Rock Disposal Area, one near the toe of the East Sage Rock Disposal Area, and two at the toe of the North 1 Rock Disposal Area. The locations of these monitoring wells are shown on Figure 2-12 of the FEIS.*

The selection of Alternative A as the preferred alternative will result in a significant reduction in disturbance of the Cherry Spring recharge area. This reduction in disturbance is a result of using the waste rock planned for the Sage Flat Rock Disposal Area expansion for pit backfill. A discussion of this reduction in disturbance is provided in Section 3.2.2 of the FEIS and in Response O-2. The reduction of disturbance in the Cherry Spring recharge area is shown on Figure 3-3.

Best management practices for stormwater are addressed in the Stormwater Pollution Prevention Plan and the Stormwater General Permit NVR300000, State of Nevada, Division of Environmental Protection, General Permit for Stormwater Discharges Associated with Industrial Activity from Metals Mining Activities.

Response No. Q-9: *As described in the FEIS (Section 3.2.1), there are very few surface water resources within the proposed Plan of Operations boundaries. All drainages within the boundary are ephemeral and are shown on Figure 3-9. Figure 1-2 shows the topography of the project area in relation to the existing facilities. Figure 1-3 provides the topography of the project area in relation to the proposed operation. Figure 2-12 provides the topography of the project area in relation to the post-mining configuration. In addition to these figures, Figures 2-2 through 2-7 show detailed topography of each of the disturbance areas. From these figures, all ephemeral drainages can be identified in relation to current, proposed, and post-mining configurations.*

The only springs within the boundary are Cherry Spring, Mill Spring, and South Water Canyon Spring. These spring features are shown on Figures 3-2, 3-3, and 3-4. In addition, Figure 2-13 (post-mining topography) of the FEIS has been revised to show springs. Mill Spring and South Water Canyon Spring are shown on Figure 2-5 in the FEIS. Cherry Spring is the only one of the three springs that could potentially be impacted by the proposed operation. As discussed in Section 3.3.2 of the FEIS, the impact would be associated with disturbance to the recharge area. The existing and proposed operations (including Alternative A), in relation to Cherry Springs, is shown in detail on Figure 3-3. It should be noted that with implementation of Alternative A (BLM preferred alternative), the potential impacts would be reduced significantly as the BLM preferred alternative would disturbed 52.1 acres less than the Proposed Action in the Cherry Spring recharge area. This is discussed further in Response O-2.

The Stormwater Pollution Prevention Plan (SWPPP), Appendix E of the Plan of Operations, addresses run-on and run-off associated with the mine facilities. Figure 4 of the SWPPP identifies the locations of Best Management Practices for sediment and erosion control.

Response No. Q-10: *BMM is currently waiting for the Corps to issue the concurrence letter for the drainages associated with the proposed expansion. If this concurrence letter is received prior to issuance of the FEIS, the letter will be included.*

Response No. Q-11: *If the Corps does not concur, BMM must comply with all applicable federal regulations regarding dredge and fill material, and would be expected to modify the proposal or apply for and obtain any necessary permits.*

Response No. Q-12**:** *The FEIS states that 91 percent of the soils are characterized either as extremely stony, very gravelly, very cobbly, or very stony material. Also indicated in the FEIS, the soils that are characterized as extremely gravelly, stony or cobbly are not included in the calculation of salvageable growth medium. The Pioche soil type would be the only soil type eliminated from salvaging due to the extremely stony nature of the material. Table 3-8 in the FEIS indicates that most of the soils to be disturbed are rated as "Poor" for use as reclamation. However, this does not preclude the use of these materials as growth medium. These same soils currently support the vegetation that existed prior to disturbance. These same soils, which have been salvaged from the existing disturbance areas, are currently being used for concurrent reclamation.*

The reclamation plan does not require soil amendments. Successful reclamation, according to the Nevada Guidelines for Successful Revegetation, is not based on the type of soil but the success of revegetation. The reclamation plan requires that Barrick meet the requirements of *these guidelines. If revegetation is not successful with the salvaged soil, then amendments may be needed, but this would only occur if necessary to meet the requirements of these guidelines. Based on current stockpiled growth medium and estimated future stockpiling (7.3 to 11.7 million cubic yards), there will be sufficient growth medium to provide a 24-inch cover on the heap leach pad and a minimum of six inches of cover on the waste rock disposal areas and other disturbance. Reclamation monitoring at the BMM and other area mines has been conducted to identify the methods that achieve the best reclamation results as indicated in Section 2.3.13 of the FEIS. These monitoring efforts will continue to identify and improve techniques for successful reclamation. Barrick will implement appropriate reclamation methods to achieve the reclamation standards set forth by the BLM and Nevada Division of Environmental Protection.*

Response No. Q-13: *The 24 inches of soil cover on the heap leach pad is provided as an evapo-transpiration cover to reduce infiltration into the heap leach pad; thus resulting in less drain down to be managed over the short- and long-term. During preparation of the Plan of Operations (Barrick 2009 as referenced in the FEIS) for the Proposed Action, several previous studies were reviewed. These studies are referenced in the Plan of Operations. These studies analyzed between 18 and 36 inches of cover on the leach pads. The studies indicated no additional benefit is realized beyond 24 inches of cover on the leach pads.*

Based on current reclamation monitoring at the BMM, the amount of cover material to be placed on the other disturbance (rock disposal area, roads, etc.) would be sufficient to meet the reclamation standards set forth by the BLM and Nevada Division of Environmental Protection. As the geochemistry in Chapter 3 of the FEIS indicates, there is no need to reduce infiltration through the rock disposal areas, therefore a cover thickness was determined to be sufficient to establish vegetation growth, similar to other disturbed areas on the mine site.

As discussed in Response Q-12, there would be sufficient growth medium resources to accommodate 24 inches of growth medium on the heap leach pads and a minimum of six inches of growth medium on other disturbance areas.

Response No. Q-14: *The FEIS states mercury reduction will occur under the proposed action. However, Barrick installed the mercury controls (listed in Table 3-21 of the FEIS) in January 2009 for existing operations; the Proposed Actions would use the same controls. The FEIS describes the current reductions and that the proposed action would realize the reductions immediately upon operation.*

Response No. Q-15: *Barrick already uses low-sulfur fuel for their existing operations and will continue to do so for the proposed action. Barrick also currently minimizes construction-related trips for both cost and efficiency reasons, through both bulk transport and detailed scheduling. All of Barrick's mobile equipment is newer and regularly maintained, to include tuning and appropriate emission controls to maintain specifications. At this time, it is not known whether Barrick intends to purchase vehicles with particulate traps.*

The FEIS has been revised to reflect Barrick's use of low-sulfur fuel, minimization of trips, use of newer equipment, and regular maintenance of vehicles. Trap control is not necessary to include in the FEIS because vehicles will be required to be certified to any Environmental Protection Agency transportation emission standards prior to being sold in the United States market. Traps will be included by vehicle manufacturers if necessary to meet diesel particulate matter standards.

Response No. Q-16: *The post-closure fluid monitoring, as indicated in the FEIS, is for monitoring after all closure activities have occurred, including fluid management of the heap leach facility. Therefore, if managing draindown solutions requires five years before solution can be managed through the use of evapotranspiration cells, the five-year post-closure monitoring would begin after that five-year period. This would result in 10 years of monitoring for that individual facility following cessation of mining or processing operations.*

Response No. Q-17: *The infiltration studies discussed in Section 2 of the FEIS are in relation to infiltration of meteoric precipitation through the cover of the heap leach pad system. The studies are prepared to assist with water balance calculations during closure and post-closure. References for these cover studies are provided in the Plan of Operations (Barrick, 2009).*

The information provided in the DEIS regarding previous closure of heap leach pads using vadose zone infiltration is misleading and has been removed from the FEIS. This information is misleading because the current closure plan of the BMM and Mooney Basin heap leach pads is for zero discharge with the implementation of either evapo-transpiration cells or evaporation cells.

Solution from both currently active heap leach pads would be managed through recirculation and active evaporation until draindown from the pads can be managed long-term through the use of evapo-transpiration cells as discussed in Section 2.3.14 of the FEIS. With the use of evapo-transpiration cells for managing long-term draindown of leach solution, no discharges would occur to the subsurface environment. Because there will be no planned discharge to the subsurface, a detailed description of the subsurface in the vicinity of the leach pads, including a discussion of the interactions of draindown solutions with the subsurface materials is not necessary.

Response No. Q-18: *Several existing permits require post-closure monitoring including the Water Pollution Control Permit and Reclamation Permit. At a minimum, the Water Pollution Control Permit requires five years of post-closure monitoring of groundwater and surface water. It is the responsibility of the operator to address issues that arise following closure of the mine.*

The reclamation permit also requires post-closure monitoring prior to release of the reclamation bond. Post-closure requirements under this permit include monitoring the stability of all reclaimed areas and monitoring for vegetation success as discussed further in Section 2.3.14 of the FEIS. If facilities become unstable during the post-closure monitoring period or do not meet the revegetation guideline requirements, the operator would be responsible for addressing these issues.

Waste rock characterization data indicates that exposure of waste rock to precipitation would not result in degradation of water resources. In addition, the bulk of draindown from the heap leach pads would be actively or passively evaporated prior to long-term management in a contained evapo-transpiration cell. Given that the risk of water resource degradation is a low, the most likely post-closure issues would be associated with erosion and revegetation success. If these issues are realized during post-closure monitoring, the operator would be responsible for mitigating these concerns. Mitigation for erosion issues could include regrading of areas and installation of additional best management practices.

Response No. Q-19: *It is not the BLM's policy to include the reclamation cost estimate for financial assurance in NEPA documents. The reclamation and closure plans, measures and techniques are presented in the FEIS to allow for public review and comment on their adequacy. Reclamation and closure costs are time-sensitive, which is why the BLM Authorized Officer has the authority to review and require cost updates at any time to ensure bond adequacy.*

The operator would be responsible for any post-closure clean-up actions, as indicated in the response to Q-18.

Response No. Q-20: *A description of the post-closure monitoring for the facilities is provided in the Water Pollution Control Permit and Reclamation Permit. The water pollution control permit provides for a minimum of five years of post-closure monitoring. Additional monitoring may be required at the discretion of Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation.*

Specific requirements of the BLM and Nevada Division of Environmental Protection during each phase of closure and reclamation will be met prior to release of any bond amount. As discussed in Response Q-18, the risk of water resource degradation is low during operation and following closure of the mine. Thus, post-closure activities would most likely include addressing stability issues and revegetation of the mine site. The BLM would retain a sufficient bond amount to address any post-closure stability issues and/or revegetation success issues. BLM also retained the authority to review and require cost updates at any time to assure bond adequacy. The operator would be responsible for addressing any post-closure issues before the bond would be released.

Response No. Q-21: *The BLM has selected Alternative A as the agency preferred alternative. In combining Alternative A with Alternative B, there would be a slight overall decrease in the quantity of surface disturbance over selecting only Alternative A. The actual reduction in disturbance acres by combining Alternatives A and B would only be 14 acres, since the majority of the required expansion needed at of the BMM heap leach pad to accommodate the additional ore would occur on undisturbed land, that has been previously authorized for disturbance Accordingly, the actual difference in the amount of disturbance would be negligible. However, to accommodate haulage of ore to the BMM leach pad, the haul distance to transport the ore would be longer resulting in additional fuel consumption, greater vehicle emissions, and more maintenance cost for vehicles.*

Response No. Q-22: *The use of conveyors was eliminated without further analysis for several reasons. The first is the majority of road disturbance for transport of ore has already occurred with the current authorized operations. To minimize additional disturbance, the conveyor system would be constructed on existing roads where possible. In addition, only 159 acres of the proposed 3,920 acres of disturbance are for new roads. The Proposed Action is primarily an expansion of existing facilities, since haul roads for ore and waste transport already exist to most of the facilities. From a disturbance standpoint, there would be very little benefit in using conveyors versus existing and proposed roads.*

Second, the mine currently transports and places run-of-mine ore on the leach pad for processing. Run-of-mine ore is material that goes directly from the pits to the leach pads without further size reduction from a crusher. Run-of-mine ore is typically too large to be transported on a conveyor system; as a result, a crusher would be required. Barrick would need *to install a centralized crusher prior to placement on a conveyor system. Electrical power use would increase significantly with the use of a crusher and ore haulage would still be required to transport the ore from the pits to the crusher.*

Third, the use of a crusher and ore transfer points on the conveyor system would likely increase the fugitive dust emissions from the mine site. Additionally, energy consumption is likely to increase as a result of power needs for the crusher and the conveyor system. Although fuel consumption may be reduced as a result of a short haul, this would likely be offset by the electrical power use.

Response No. Q-23: *Figures 2-14 and 2-18 have been changed in the FEIS to clarify the changes in the leach pad under Alternative B.*

APPENDIX D

BLM Best Management Practices

1. Any change or amendment to your minerals operation must be brought to the attention of the Ely District Office Manager or an authorized officer prior to implementation of the change on the ground.

2. Cultural resource inventories will be conducted on all proposed areas of potential surface disturbing impacts, including appropriate buffer zones, prior to authorization of the mineral operations. Inventories will be completed by BLM or BLM-approved cultural resource permit holders.

3. A noxious weed survey will be completed prior to any earth disturbing activity including cross-country travel. Noxious or invasive weeds that may be located on the site will be managed according to methods to be approved by the Authorized Officer. Should chemical methods be approved, the lessee must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date. A Pesticide Application Report must be submitted to the Authorized Officer by the end of each fiscal year following chemical application.

4. Existing access must be used whenever possible. Off-road vehicular travel shall be held to an absolute minimum necessary to complete operations. Additional roads, if needed, will be kept to an absolute minimum and the location of routes must be approved by the Authorized Officer prior to construction.

5. All survey monuments, claim markers, witness corners, reference monuments, bearing trees, etc., must be protected against destruction, obliteration or damage. When operations are concluded, the operator will remove all survey markers, stakes, flagging, etc., for which the operator has no further need.

6. Removal or alteration of existing improvements (fences, cattle guards, etc.) is not allowed without prior approval of the Authorized Officer. Existing improvements will be maintained in a serviceable and safe condition. Upon completion of operations, any authorized facility alterations will be restored to the specification of the Authorized Officer.

7. All vegetative clearing will be held to the minimum necessary to accommodate the planned operations.

8. No blasting will be permitted if it will be detrimental to the significant characteristics of archeological or historical values, recreation areas, known caves, water wells, or springs.

9. During periods of adverse conditions affecting soil moisture caused by climatic factors such as thawing, heavy rains, snow, flooding, or drought, all activities off existing maintained roads that create excessive surface rutting may be suspended. When adverse conditions exist, the operator will contact the Authorized Officer for an evaluation and decision based on soil types, soil moisture, slope, vegetation, and cover.

10. All trash, garbage, debris, and foreign matter must be removed and properly disposed. Site must be maintained and left in a clean and safe condition. Burning will not be allowed at the site.

11. No oil or lubricants will be drained onto the ground surface. Any spills less than 25 gallons will be immediately cleaned up; spills over 25 gallons will be reported to the Authorized Officer and NDEP.

12. All construction, operation, and maintenance activities will comply with all applicable Federal, State, and local laws and regulations regarding the use of hazardous substances and the protection of air and water quality.

13. The operator will work with the Authorized Officer on the containment of drilling fluids and drill hole cuttings. Mud, separation pits, and other containments used for the storage of any hazardous materials will be adequately fenced, posted, and/or covered.

14. Powder magazines will be located at least 0.25-mile from traveled roads. Loaded shot holes and charges will be attended at all times. Use of explosives will be according to applicable Federal and State regulations.

15. The operator will make every effort to prevent, control, or suppress any fire in the operating area. The operator may be required to have fire-fighting equipment available on-site while operations are in progress, depending on hazards inherent in the type of operation and fire hazard levels. Reports of uncontrolled fires will be relayed immediately to the Ely District Office Manager or Authorized Officer. The BLM Fire Dispatch telephone number is (775) 289-1925 or 1-800-633-6092. After working hours call 911 or the White Pine County Sheriff's Office at (775) 482-8101.

16. Lands containing unstable/highly erodible soils may require additional protective measures such as restrictions on surface entry during periods of excessive runoff, avoidance of selected areas, and special reclamation techniques.

17. All decisions issued by the Ely District Office will have a Needs Assessment completed in accordance with the Nevada BLM and SHPO Protocol.

18. Documentation (photos, drawings, etc.) will be collected on all sites eligible for the National Register of Historic Places. This will allow tracking of human and natural caused deterioration.

19. If cultural resources (historic or archaeological materials) are discovered during construction, the operator is to immediately stop work, protect such materials, and contact the Authorized Officer. Within five working days, the Authorized Officer will inform the operator as to:

    a. The appropriate treatment measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not feasible);

    b. A timeframe for the Authorized Officer to complete an expedited review and necessary consultation;
    c. The operator's responsibility for treatment costs; and

d. Technical and procedural guidelines for the conduct of the treatment. Upon verification from the Authorized Officer that the required treatment has been completed, the operator will then be allowed to resume construction.

20. All identified cultural resources will be avoided by project-related activities per the Nevada BLM standards for cultural resources. If avoidance is not feasible, mineral activities must cease until mitigating measures or treatments are developed and implemented and Section 106 consultation is completed. Archaeological monitors may be required in special cases.

21. The operator is responsible for informing all persons associated with the project that knowingly disturbing cultural resources (historic or archaeological) or collecting artifacts is illegal.

22. During winter operations, requirements for cultural resource inventories may be waived by the Authorized Officer if the unsurveyed areas are located on bare and frozen ground or are completely covered (100%) by snow and the snow is sufficiently deep (approximately 4 to 6 inches) to prevent ground disturbing ruts. Should conditions change while operations are in progress, additional considerations may be necessary. The operator must contact the Authorized Officer to determine if an archaeological monitor or an inventory may be required prior to continuance of mineral activities.

23. Any activity planned within the viewshed of the Pony Express National Historic Trail or other National Landscape Conservation System (NLCS) properties, listed National Register Districts, or properties eligible under criterion A, must undergo a visual assessment. Appropriate mitigation of visual impacts will be implemented as necessary to keep the setting of the management corridor in as natural a condition as possible. Special reclamation measures may be required to restore the setting to its natural condition.

24. Under no circumstances will wild horses, burros, wildlife, or livestock be willfully harassed. When traveling roads, all livestock gates will be closed after use.

25. To protect wildlife and wild horses, perimeter fences will be flagged every 16 feet with white flagging. Flagging should be at least one inch wide and with at least 12 inches hanging free from the top wire of the fence. Fences will also avoid obvious horse migration routes (deep trails, stud piles) if at all possible.

26. If the project involves heavy or sustained traffic, road signs for safety and protection of wild horses and wildlife will be required.

27. Any new disturbance commencing between April 15 and July 15 must first be surveyed for nesting migratory birds. If nests are found, the project may be moved or delayed until July 15.

28. Any identified bald eagle roost sites, peregrine falcon back sites, and occupied raptor aeries (nests) will be avoided during mineral operations. A 0.5-mile buffer zone will be imposed on all activities around occupied nests.

29. Actions, which will adversely impact a special status species (including federally listed, proposed, and candidate species, state-protected species, and BLM sensitive species or its

habitat) will be modified in order to prevent possible future listing of these species as threatened or endangered. The following restrictions apply to the following species:

a. Sage Grouse. No surface disturbance will be allowed within an active sage grouse lek. No surface use will be allowed within ½ mile of an active sage grouse lek from midnight until 10 a.m. during the period March 15 through May 31.

b. Ferruginous Hawk. Ferruginous Hawk nest sites will not be disturbed. No surface use will be allowed within ½ mile of an occupied Ferruginous Hawk nest during the period March 1 through June 30 or until the birds have fledged (left) the nest.

c. Mule Deer Habitat SOP. Within the Ely District, there are identified mule deer key habitats (key habitats include habitats such as crucial habitats. These habitats are essential to populations of big game. If elements of these habitats are compromised, the results could be detrimental to the population); therefore, prior to entry onto the land, the operator will discuss the proposed activity with the appropriate BLM Authorized Officer. Additional measures may be required for the protection of the deer and their habitat which may include:

i. Limitation on surface use during the period of crucial deer use.
ii. Minimizing disturbance to habitat and forage.

d. Pygmy Rabbit SOP. Within the Ely District there are favorable habitats selected by pygmy rabbits as burrowing areas. Therefore, prior to entry into these areas the operator will discuss the proposed activities with the BLM's Authorized Officer who may require additional measures for the protection of pygmy rabbits and their habitat. Such measures may include:

i. Avoidance of selected areas.
ii. Restriction of activities near burrows during the months of April through June.

30. To eliminate the transport of vehicle-borne weed seeds, roots, or rhizomes, all vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities; for emergency fire suppression; or for authorized off-road driving will be free of soil and debris capable of transporting weed propagules. All such vehicles and equipment will be cleaned with power or high pressure equipment prior to entering or leaving the work site or project area. Vehicles used for emergency fire suppression will be cleaned as a part of check-in and demobilization procedures. Cleaning efforts will concentrate on tracks, feet or tires, and on the undercarriage. Special emphasis will be applied to axles, frames, cross members, motor mounts, on and underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles. Cleaning sites will be recorded using GPS or other mutually acceptable equipment and provided to the BLM Weed Coordinator or designated contact person.

31. Prior to the entry of vehicles and equipment to a project area, areas of concern will be identified and flagged in the field by a weed scientist or qualified biologist. The flagging will alert personnel or participants to avoid areas of concern.

32. Prior to entering public lands, the Contractor, Operator, or permit holder will provide information and training regarding noxious weed management and identification to all personnel who will be affiliated with the implementation and maintenance phases of the

project. The importance of preventing the spread of weeds to uninfested areas and the importance of controlling existing populations of weeds will be explained.

33. To eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes, infested soils or materials will not be moved and redistributed on weed-free or relatively weed-free areas. In areas where infestations are identified or noted and infested soils, rock, or overburden must be moved, these materials will be salvaged and stockpiles adjacent to the area from which they were stripped. Appropriate measures will be taken to minimize wind and water erosion of these stockpiles. During reclamation, the materials will be returned to the area from which they were stripped.

34. Prior to project approval, a site specific weed survey will occur and a Weed Risk Assessment will be completed. Monitoring will be conducted for a period no shorter than the life of the permit or until bond release and monitoring reports will be provided to the BLM. If the spread of noxious weeds is noted, appropriate weed control procedures will be determined in consultation with BLM personnel and will be in compliance with the appropriate BLM Handbook sections and applicable laws and regulations. All weed control efforts on BLM lands will be in compliance with BLM Handbook H-9011, H-9011-1 Chemical Pest Control, H-9014 Use of Biological Control Agents of Pests on Public Lands, and H-9015 Integrated Pest Management. Submission of Pesticide Use Proposals (PUPs) and Pesticide Application Records (PARs) will be required.

35. All vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities; for emergency fire suppression; or for authorized off-road driving that are used to drive through, mow, harvest, scrape, or otherwise contact plant species listed on the Nevada Noxious Weed list or specifically identified by the Ely District Office will be cleaned prior to continued use in weed free areas. Cleaning requirements are described in SOP#1.2.5.4.

36. For mineral activity, retain bonds for weed control until the site is returned to desired vegetative conditions.

37. To provide for effective rehabilitation of the disturbed area, all available growth medium, as practical, will be removed and stockpiled. Any trees removed will be separated from soils and stockpiled separately.

38. Topsoil stockpiles and road berms, if scheduled to be left in place over the growing season, will be seeded with an approved site-specific interim seed mix to reduce erosion, preserve the biological flora and fauna, and prevent the establishment of noxious weeds and other undesirable plant species.

39. The operator shall reclaim the disturbed area concurrently or at the earliest feasible time by recontouring to conform with pre-existing topography (including filling of trenches), to the extent possible, followed by redistribution of stockpiled topsoil over the reclaimed area. Compacted areas will be ripped to a depth of 12 inches unless in solid rock. Ripped areas may need further work to break up large clods and produce a fine-grained seed bed.

40. Site preparation for reclamation may include contour furrowing, terracing, reduction of steep cut and fill slopes, and the installation of water bars, etc.

41. Reseeding may be required, in which case a site-specific seed mixture will be recommended by the operator and approved by the Authorized Officer. Seeding is recommended only between October 1 and March 15 for the northern part of the District, and November 1 through March 1 for the southern part of the District.

42. Reclamation will normally be accomplished with native seeds only. These will be representative of the indigenous species present in the adjacent habitat. Rationale for potential seeding with selected non-natives must be documented. Possible exceptions could include use of non-natives for a temporary cover crop to out-compete weeds. Where large acreages are burned by the fires and seeding is required for erosion control, all native species can be cost prohibitive and/or unavailable. In all cases, seed mixes will be approved by the Authorized Officer prior to planting.

43. All interim and final seed mixes, hay, straw, and hay/straw products must be tested for noxious weeds and certified free of plant species listed on the Nevada Noxious Weed list.

44. All drill holes must be plugged per Nevada State statute (Division of Water Resources "Regulations for Water Well and Related Drilling") as wavered. If artesian flow is encountered, the drill hole must be plugged immediately. The location, depth, and relative flow rate of any water intercepted shall be reported to the Ely District Office Manager or the Authorized Officer. Drill cuttings will be returned to the hole of possible, or at a minimum, raked and spread out so as not to impede regrowth of vegetation or to create erosion problems.

45. The Ely District Office Manager or the Authorized Officer will be notified within 5 days of completion of reclamation work so that timely compliance inspections can be completed.

46. The area is considered to be satisfactorily reclaimed when all disturbed areas have been recontoured to blend with the natural topography, erosion has been stabilized, and an acceptable vegetative cover has been established. The Nevada Guidelines for Successful Revegetation for the Nevada Division of Environmental Protection, the Bureau of Land Management, and the U.S.D.A. Forest Service (or most current revision or replacement of this document) will be used to determine if revegetation is successful.

47. In areas of known noxious weed infestations, monitoring of noxious weed will be conducted on an annual basis. Monitoring will be conducted until project release. If the spread of noxious weeds is noted, the infested areas will be further evaluated to determine the appropriate remedial action and appropriate treatment. Appropriate weed control procedures, including target species, timing of control, and method of control, will be determined in consultation with BLM personnel.

48. No noxious weeds will be allowed on the site for reclamation release. Any noxious weeds that become established will be controlled.

APPENDIX E

Recent Waste Rock Analytical Data

MWMP Tests for Bida Pits

Station Name		BIDA	Mooney-Bida Waste- Intrusive	Mooney-Bida Waste- Intrusive	Mooney-Bida Waste- Sedimentary	Mooney-Bida Waste- Sedimentary	Mooney-Bida Waste- Intrusive	Mooney-Bida Waste- Sedimentary	Bida 2 Waste Facility	Bida 2 Waste Facility	Bida 3 Waste Facility	Bida 3 Waste Facility
Stn.Code		BIDA	BWF_Int_OX	BWF_Int_OX	BWF_Sed_OX	BWF_Sed_OX	BWF_Int_OX	BWF_Sed_OX	B2WF_Int_OX	B2WF_Sed_OX	B3WF_Int_OX	B3WF_Sed_OX
Sampling Session		3rd Qtr. 2005	3rd Qtr. 2006	4th Qtr. 2006	3rd Qtr. 2006	4th Qtr. 2006	1st Qtr. 2007	1st Qtr. 2007	4th Qtr. 2008	4th Qtr. 2008	4th Qtr. 2008	4th Qtr. 2008
Collect Date/Time		9/30/05	10/3/06	12/28/06	10/3/06	12/28/06	3/16/07	3/16/07	12/3/08	12/3/08	12/3/08	12/3/08
Lab Name		ELI	ELI	ELI	ELI	ELI	SVL	SVL	SVL	SVL	SVL	SVL
Sampled By		KN	Nick	Nick	Nick	Nick	Ore Control	Ore Control	Nick	Nick	Nick	Nick
Lab Test Date	Units	38625	38993	39079	38993	39079	39157	39157	39785	39785	39785	39785
Lab Reference Number		C05100169-002A	C06100322-004	E556614	C06100322-005	E556615	E565819	E565823	W8L0154-05	W8L0154-06	W8L0154-03	W8L0154-04
MWMP Extraction												
Alkalinity, Total	mg/L as CaCO3	60	36	58.6	58	77.8	20.9	26.2	38	56.8	15.9	84.1
Alkalinity, Bicarbonate	mg/L as CaCO3	73	44	58.6	69	77.8	20.9	26.2	38	56.8	15.9	84.1
Aluminum	mg/L	0.04	0.07	<0.080	0.18	<0.080	<0.080	<0.080	7.06	1.69	<0.080	0.537
Antimony	mg/L	0.01	0.002	0.0144	0.014	0.0116	<0.0030	<0.0030	0.263	0.0327	0.0441	0.00413
Arsenic	mg/L	0.043	0.017	0.071	0.004	0.032	0.0135	0.0144	0.0289	0.00606	0.00451	0.0119
Barium	mg/L	0.088	0.199	0.192	0.1	0.182	0.111	0.0974	0.387	0.142	0.0414	0.185
Beryllium	mg/L	ND	ND	<0.0020	ND	<0.0020	<0.0020	<0.0020	<0.00200	<0.00200	<0.00200	<0.00200
Bismuth	mg/L	ND		<0.06		<0.06						
Boron	mg/L	0.12	0.3	0.05	ND	0.06	0.19	0.22	0.159	0.098	0.073	0.109
Cadmium	mg/L	ND	0.003	<0.0020	ND	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	mg/L											
Chloride	mg/L	6	311	2.35	9	3.52	0.49	0.48	1.46	1.79	1.05	7.18
Chromium	mg/L	ND	ND	<0.0060	0.003	0.01	<0.0060	<0.0060	0.0076	<0.0060	<0.0060	<0.0060
Cobalt	mg/L	ND		<0.006		<0.006						
Copper	mg/L	0.006	1.61	<0.010	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cyanide (WAD)	mg/L	ND	ND	<0.010	ND	<0.010	<0.010	<0.010				
Fluoride	mg/L	0.8	0.3	0.43	0.4	0.41	0.25	0.47	0.754	0.56	0.165	0.639
Gallium	mg/L	0.003		<0.020		<0.020						
Iron	mg/L	ND	0.04	<0.06	ND	<0.06	<0.06	<0.06	2.23	0.297	<0.060	0.132
Lead	mg/L	ND	0.347	<0.0075	0.003	<0.0075	<0.0075	<0.0075	<0.00300	<0.00300	<0.00300	<0.00300
Lithium	mg/L	0.008		<0.020		<0.020						
Magnesium	mg/L	2.9	68	2.84	2	4.33	0.74	1.01	3.4	5.27	5.85	2.73
Manganese	mg/L	ND	0.059	<0.004	0.004	<0.004	<0.004	<0.004	0.0298	0.0218	0.0319	<0.0040
Mercury	mg/L	ND	ND	<0.00020	0.0228	0.00189	<0.00020	<0.00020	0.079	0.092	0.00962	<0.00020
Molybdenum	mg/L	0.004		<0.008		0.016						
Nickel	mg/L	ND	0.104	<0.010	ND	<0.010	<0.010	<0.010	0.01	<0.010	<0.010	<0.010
Nitrate + Nitrite as N	mg/L											
Nitrate as N	mg/L	2.6	43.6	0.439	0.6	0.92	0.289	0.7				
Nitrite as N	mg/L								1.25	7.28	4.22	4.75
pH (s.u.)	SU	8.22	7.56	7.34	8.36	7.56	6.96	6.69	7.68	7.87	7.08	7.98
Phosphorus	mg/L	ND		<0.05		<0.05						
Potassium	mg/L	5.2	23	11.6	3	4.37	0.59	1.7	14	18.1	25.4	4.01
Scandium	mg/L											
Selenium	mg/L	ND	0.005	<0.04	ND	<0.04	<0.0030	<0.0030	<0.00300	<0.00300	<0.00300	<0.00300
Silver	mg/L	0.003	ND	<0.0050	ND	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	mg/L	22.5	17	4.37	5	10.2	3.92	4.86	9.36	6.59	8.26	19.7
Strontium	mg/L	0.093		0.085		0.094						
Sulfate	mg/L	43	53	20.7	36	21.7	4.37	11.5	34.2	38.4	127	23.7
Thallium	mg/L	ND	0.0054	<0.0020	ND	0.0022	<0.00200	<0.00200	0.00392	0.00349	0.00721	<0.00100
Tin	mg/L	0.001		<0.05		<0.05						
Titanium	mg/L	ND		<0.0050		<0.0050						
Total Dissolved Solids	mg/L	1.07	838		121							
Vanadium	mg/L	ND		<0.0050		<0.0050						
Zinc	mg/L	0.06	12.7	<0.010	0.01	<0.010	<0.010	<0.010	0.023	0.0132	<0.0100	<0.0100
Acid Base Accounting												
Paste pH (s.u.)												
AGP (tons CaCO3/kton)		17	<0.3	4.1	<0.3	<0.3	16.3	2.8	1.31	1.28	12.3	0
ANP (tons CaCO3/kton)		1	5	<0.3	2	517	1.5	1.5	2	2	1.5	627
NNP (tons CaCO3/kton)		-16	-5	-4.1	-89	517	-14.7	-1.3	0.69	0.72	-10.8	627

MWMP Tests for Top Pit

Sample Location		Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit
Reporting Period		1992	2nd Quarter 1995	3rd Quarter 1995	4th Quarter 1995	1st Quarter 1996	2nd Quarter 1996	3rd Quarter 1996	Fouth Quarter 199	1st Quarter 1997	4th Quarter 1997	1st Quarter 1998	3rd Quarter 1998
Sample Date		1/9/1991	6/14/1995	8/31/1995	12/12/1995	1/4/1996	6/4/1996	8/7/1996	12-04-96	Mar-97	11-18-97	03-09-98	10-09-98
Received Date		1/3/1991	6/14/1995	–	–	–	–	–	–	–	–	–	–
Lab Name		Monitor	WestChem	–	–	West Chem	West Chem	Chemtech	Barringer	AAL	Barringer	Barringer	Barringer
Report Date		2/11/1991	7/10/1995	–	–	7/10/1996	–	–	–	–	–	–	–
Lab ID		1706	95-A001261	95-A002411	95-A003470	96-A001424	–	–	964104-7	–	974205-2	C0042	983449-1
Job ID	Units	–	–	–	–	–	–	–	964104E	EV2816	974205E	981611e	983449E
Source		--	–	–	–	Top	Top	Top	Top	Top	Top	Top	Top
MWMP Extraction													
Alkalinity, Total	mg/L as CaCO3	58	78.4	132	79.6	79	88	62	–	59	47	54	60
Alkalinity, Bicarbonate	mg/L as CaCO3	–	78.4	132	79.6	–	88	–	–	–	–	–	–
Aluminum	mg/L	<0.05	<0.2	0.285	0.147	0.04	0.01	<0.1	<0.05	0.093	<0.05	<0.02	<0.02
Antimony	mg/L	<0.05	<0.2	0.047	<0.02	<0.08	0.029	0.024	<0.006	0.012	<0.003	0.012	0.005
Arsenic	mg/L	0.047	<0.1	<0.1	0.055	0.035	0.091	0.27	0.28	0.094	0.048	0.169	0.11
Barium	mg/L	0.269	0.0	0.069	0.1	0.04	0.05	0.2	0.36	0.131	0.29	0.14	0.25
Beryllium	mg/L	<0.001	<0.005	<0.005	<0.002	<0.001	<0.0002	<0.1	<0.004	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/L	<0.1	<0.035	<0.035	<0.011	<0.2	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Boron	mg/L	0.188	–	–	–	–	–	–	–	–	–	–	0.2
Cadmium	mg/L	<0.007	<0.005	<0.005	<0.002	<0.005	<0.001	<0.001	<0.005	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L	18.1	21.4	27.5	24.4	17.5	20	22	21.1	17.6	21.6	18.4	16.7
Chloride	mg/L	<0.01	<1.5	15.7	2.59	2	<1	2	<0.01	3.74	13	<4	5
Chromium	mg/L	<0.01	<0.01	<0.01	<0.003	<0.005	0.001	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	mg/L	<0.007	<0.005	<0.005	0.001	<0.01	<0.002	<0.1	<0.01	<0.02	<0.01	<0.01	<0.01
Copper	mg/L	<0.007	0.006	0.015	0.028	0.1	0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.02
Cyanide (WAD)	mg/L	0.021	–	<0.005	–	–	–	–	0.01	<0.005	0.01	0.01	<0.01
Fluoride	mg/L	0.833	0.729	1.18	0.9	<0.5	<0.5	0.2	0.4	0.72	0.5	0.8	1
Gallium	mg/L	<0.02	<0.1	<0.1	<0.006	<0.05	<0.01	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	mg/L	0.011	0.2	<0.05	0.229	0.03	0.01	<0.1	<0.05	0.026	<0.1	<0.05	<0.05
Lead	mg/L	0.086	<0.03	<0.03	<0.01	<0.005	<0.005	<0.005	239.2	0.013	<0.003	<0.002	<0.002
Lithium	mg/L	0.014	<0.005	0.016	0.009	<0.01	0.006	<0.1	<0.04	<0.05	<0.02	<0.01	<0.01
Magnesium	mg/L	1.2	2.49	12	7.01	10.5	7.55	9	3.30	4.22	4.60	3.74	2.97
Manganese	mg/L	<0.003	0.006	<0.005	0.015	0.01	<0.002	<0.1	<0.005	<0.01	<0.005	<0.005	<0.005
Mercury	mg/L	<0.0005	0.0016	0.0062	0.037	0.02	0.027	0.0012	0.0252	<0.0002	0.0037	0.03	0.0033
Molybdenum	mg/L	0.028	0.021	0.022	0.025	<0.02	0.009	<0.1	0.010	0.019	0.010	<0.01	0.030
Nickel	mg/L	<0.015	<0.015	<0.015	<0.006	<0.01	<0.002	<0.1	<0.04	<0.02	<0.04	<0.04	<0.04
Nitrate + Nitrite as N	mg/L	–	2.189	5.07	3.75	6.5	1.3	6.39	4.7	6.7	4.2	4.9	1.71
Nitrate as N	mg/L	2.17	–	--	–	–	--	–	–	--	–	–	–
Nitrite as N	mg/L	–	–	–	–	–	--	–	–	–	–	–	–
pH (s.u.)	SU	7.8	8.05	8.22	8.13	8.23	8.06	8.43	7.86	7.42	7.64	7.24	7.5
Phosphorous	mg/L	0.002	0.053	0.097	0.068	0.05	0.05	<0.1	<0.1	<0.02	<0.05	<0.05	<0.05
Potassium	mg/L	5.67	2.32	2.16	3.28	2.5	2.95	4	<5	2.66	<5	3	2
Scandium	mg/L	<0.02	<0.01	<0.01	<0.001	<0.002	<0.005	<0.1	<0.002	<0.05	<0.005	<0.005	<0.005
Selenium	mg/L	<0.005	<0.1	<0.1	<0.04	<0.02	<0.002	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005
Silver	mg/L	<0.02	<0.01	<0.01	<0.01	<0.005	<0.002	<0.002	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	mg/L	9.75	5.77	49	12.5	6.4	6.5	5.7	7	4.61	8	5	15
Strontium	mg/L	0.048	0.039	0.095	0.049	0.04	0.042	<0.1	0.051	0.062	0.052	0.08	0.059
Sulfate	mg/L	1.4	3.76	55.7	15.5	6	8	13	7	6.39	9	<5	8
Thallium	mg/L	<0.15	<0.1	<0.002	<0.002	0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001
Thorium	mg/L	<0.05	–	–	–	–	–	–	–	--	–	–	–
Tin	mg/L	<1.30	<0.1	<0.1	<0.1	<0.1	<0.02	<0.1	<0.03	0.200	<0.03	<0.03	<0.03
Titanium	mg/L	<0.001	<0.005	<0.005	<0.005	<0.01	<0.002	<0.1	<0.01	<0.05	<0.01	<0.01	<0.01
Total Dissolved Solids	mg/L	117	118	307	155	132	50	154	80	100	100	122	118
Uranium	mg/L	2	–	–	–	–	–	–	–	–	–	–	–
Vanadium	mg/L	<0.007	<0.007	0.009	<0.007	<0.01	0.002	<0.1	<0.01	<0.05	<0.01	<0.01	<0.01
Zinc	mg/L	0.021	<0.005	<0.005	0.0	<0.01	<0.002	<0.1	<0.02	<0.02	0.02	<0.02	0.02
Acid Base Accounting													
Paste pH (s.u.)		–	8.35	8.76	8.77	–	9.27	8.87	–	–	–	–	–
AGP (tons CaCO3/kTon material)		0.51	2.03	1.94	1.31	–	1.82	1.94	2.5	0.31	1.1	2.4	2.5
ANP (tons CaCO3/kTon material)		25.3	427	429	434	–	504	831	98	432	171	84	76
NNP (tons CaCO3/kTon material)		24.8	425.0	427.1	432.7	–	502.4	629.1	95.5	432	169.9	81.6	73.5
Total Sulfur (wt%)		–	–	--	–	–	–	–	–	0.04	–	0.077	–

MWMP Tests for Top Pit (continued)

Sample Location	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit
Reporting Period	1st Quarter 1999	2nd Quarter 1999	3rd Quarter 1999	4th Quarter 1999	1st Quarter 2000	2nd Quarter 2000	3rd Quarter 2000	4th Quarter 2000	1st Quarter 2001	2nd Quarter 2001	3rd Quarter 2001	4th Quarter 2001	1st Quarter 2001
Sample Date	3/2/1999	6/22/1999	8/31/1999	11/1/1999	--	6/4/2000	8/16/2000	11/21/2000	3/1/2001	6/20/2001	9/27/2001	12/31/2001	4/3/2002
Received Date	--	--	--	--	3/6/2000	6/7/2000	8/21/2000	11/27/2000	3/5/2001	6/25/2001	10/2/2001	1/4/2002	4/8/2002
Lab Name	Barringer	Barringer	Barringer	Barringer	SVL	SVL	SVL	SVL	SVL	SVL	SVL	SVL	SVL
Report Date	--	--	--	--	3/17/2000	6/21/2000	9/5/2000	12/11/2000	3/20/2001	7/10/2001	10/16/2001	1/21/2002	4/22/2002
Lab ID	C0042	992239-1	C0042	C0042	E228257	E234753	E241837	249831	E256917	E268383	278855	287514	E294349
Job ID	991544-14	992239E	9909095-1A	9912090	93799	94585	95320	96244	97072	98342	99473	100468	101268
Source	Top	Top	Top	Top	Top	Top	Top	Top	Top	Top	Top	Top	Top
MWMP Extraction													
Alkalinity, Total	25	21	21	34	39.1	32.1	24.4	41.2	50.9	58.7	58.3	100	72
Alkalinity, Bicarbonate	--	--	--	--	39.1	32.1	24.4	41.2	50.9	58.7	58.3	100	72
Aluminum	0.04	0.07	0.10	0.04	0.033	0.058	<0.024	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
Antimony	<0.003	<0.003	<0.003	0.00	<0.002	0.004	<0.002	0.023	0.009	0.029	0.007	0.049	0.009
Arsenic	0.007	0.009	0.084	#N/A	0.022	0.055	<0.04	0.16	0.1	0.1	0.32	0.06	0.26
Barium	0.02	<0.02	0.007	0.430	0.061	0.074	0.025	0.099	0.113	0.221	0.2	0.259	0.212
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	<0.05	<0.05	<0.05	<0.05	0.024	<0.024	<0.044	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	--	<0.1	--	--	0.066	0.045	0.054	0.13	0.1	0.09	0.12	0.1	0.13
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.0024	<0.0024	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	8.3	6.2	1.60	8.50	12.2	11.1	7.51	20.9	16.7	26.8	18.8	42.9	23.5
Chloride	< 4	<4	< 4	< 4	0.4	1.6	0.8	3.8	2.5	6.5	4.1	1.9	4.4
Chromium	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.006	<0.006	<0.008	0.007	<0.006	<0.006	<0.006
Cobalt	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Copper	<0.01	<0.01	<0.01	<0.01	<0.003	<0.003	<0.003	0.012	<0.003	<0.003	<0.003	<0.003	<0.003
Cyanide (WAD)	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Fluoride	<0.1	<0.1	0.25	0.17	<0.1	0.2	<0.1	0.4	0.3	0.4	0.4	0.2	0.2
Gallium	<0.05	<0.05	<0.05	<0.05	<0.022	<0.022	<0.022	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Iron	<0.05	<0.1	<0.05	<0.05	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Lead	0.003	0.003	0.003	0.003	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Lithium	<0.01	<0.01	<0.01	<0.01	0.004	<0.003	<0.004	0.005	0.006	0.016	0.006	0.033	0.008
Magnesium	0.40	0.38	0.40	0.82	1.2	1.88	0.94	4.96	2.85	3.5	3.17	5.47	4.93
Manganese	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.002
Mercury	0.0006	<0.0002	0.0039	0.0012	0.0008	0.0058	0.002	0.0005	0.002	<0.0002	0.014	0.0005	0.0142
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.008	0.009	<0.008	0.107	0.014	0.044	0.017	0.061	0.015
Nickel	<0.04	<0.04	<0.04	<0.04	<0.023	<0.023	<0.024	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01
Nitrate + Nitrite as N	1.21	0.31	0.29	0.20	--	--	0.46	--	1.2	4.12	2.06	1	1.7
Nitrate as N	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrite as N	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (s.u.)	7.77	6.82	7.34	7.37	7.75	7.98	7.73	6.87	7.78	8.08	7.94	8.04	8.04
Phosphorous	<0.05	<0.05	0.08	0.11	<0.074	<0.074	<0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Potassium	< 1	<1	< 1	< 1	<1.7	<1.7	<1.7	2.8	2.3	6.2	3.2	5.6	3.3
Scandium	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.006	<0.006	<0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium	< 5	2	3.80	5.10	1.77	1.27	1.62	5.6	3.7	4.2	4.9	6.4	4.9
Strontium	0.009	0.007	0.01	0.03	0.026	0.043	0.013	0.064	0.053	0.104	0.054	0.16	0.054
Sulfate	< 5	<5	24.00	< 5	0.8	3.4	0.5	41	6.5	15.4	4.1	37.2	14.3
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
Thorium	--	--	--	--	--	--	--	--	--	--	--	--	--
Tin	<0.05	<0.03	0.01	<0.05	<0.05	<0.05	<0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	<0.01	<0.01	<0.01	<0.01	<0.007	<0.007	<0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Dissolved Solids	20	21	48	59	34	44	37	111	88	151	100	188	120
Uranium	--	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.02	<0.02	<0.02	<0.02	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	0.005	0.006
Acid Base Accounting													
Paste pH (s.u.)	--	--	--	--	--	--	--	--	--	--	--	--	--
AGP (tons CaCO3/kTon material)	0.9	--	0.90	0.90	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.3	12.8	0.6
ANP (tons CaCO3/kTon material)	34	--	14	43	748	443	818	471	553	505	323	359	190
NNP (tons CaCO3/kTon material)	33.1	--	13.1	42.1	748	443	818	471	553	505	323	346	190
Total Sulfur (wt%)	--	--	--	--	--	--	--	--	--	--	--	--	--

MWMP Tests for Top Pit (continued)

Sample Location	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit	Top Pit
Reporting Period	2nd Quarter 2002	3rd Quarter 2002	4th Quarter 2002	1st Quarter 2003	2nd Quarter 2003	3rd Quarter 2003
Sample Date	7/18/2002	9/17/2002	12/23/2002	3/31/2003	6/26/2003	9/30/2003
Received Date	7/24/2002	9/20/2002	12/26/2002	3/31/2003	--	10/7/2003
Lab Name	SVL	SVL	SVL	AAL	SEM	SEM
Report Date	8/8/2002	10/3/2002	1/10/2003	4/28/2003	7/15/2003	10/22/2003
Lab ID	E304921	E311302	E320814	NV00040	S200306-1530	S200310-0398
Job ID	102471	103271	104493	EV7155	54212	56314
Source	Top	Top	Sage Flats	Sage Flats	Sage Flats	--
MWMP Extraction						
Alkalinity, Total	50.9	31.2	81.1	89	<1	<1
Alkalinity, Bicarbonate	50.9	9.4	81.1	0	74	71
Aluminum	<0.2	0.09	<0.020	<0.02	<0.05	<0.05
Antimony	<0.01	0.016	0.0075	0.009	0.019	0.005
Arsenic	0.37	0.54	0.062	0.393	0.14	0.056
Barium	0.202	0.097	0.0403	1.34	0.21	0.038
Beryllium	<0.002	<0.002	<0.0020	<0.002	<0.002	<0.002
Bismuth	<0.2	<0.02	<0.020	<0.02	<0.05	<0.05
Boron	0.1	0.13	0.186	<0.1	<0.05	0.13
Cadmium	<0.002	<0.002	<0.0020	0.0034	<0.002	<0.002
Calcium	15.1	17.1	24.4	103	20	9.7
Chloride	1.1	1.4	1.93	220.0	1.4	8.6
Chromium	0.007	<0.006	<0.0060	0.038	<0.002	0.003
Cobalt	<0.006	<0.006	<0.0060	<0.02	<0.002	<0.002
Copper	<0.003	<0.003	0.0088	0.074	0.061	0.053
Cyanide (WAD)	<0.01	<0.01	<0.010	0.011	0.01	<0.005
Fluoride	0.4	0.1	0.27	0.56	0.19	0.3
Gallium	<0.02	<0.02	<0.020	<0.05	<0.1	<0.1
Iron	<0.02	<0.02	<0.020	<0.02	<0.1	<0.05
Lead	<0.005	<0.005	<0.0050	0.011	<0.002	<0.002
Lithium	0.005	<0.004	<0.0040	0.130	<0.1	<0.1
Magnesium	3.11	1.27	4.41	13	4.5	3.3
Manganese	<0.002	<0.002	<0.0020	0.234	<0.002	0.004
Mercury	0.0082	0.0012	0.00253	0.1740	0.036	0.019
Molybdenum	0.02	0.04	<0.0080	<0.02	0.004	0.006
Nickel	<0.01	<0.01	<0.010	0.029	0.06	<0.016
Nitrate + Nitrite as N	0.69	1.38	2.68	0.02	0.93	2.9
Nitrate as N	--	--	--	--	--	--
Nitrite as N	--	--	--	--	--	--
pH (s.u.)	7.97	9.74	7.67	6.66	8.3	8.08
Phosphorous	<0.005	<0.05	<0.050	0.28	0.23	0.2
Potassium	3.2	2	2.9	11	3	<1
Scandium	<0.002	<0.002	<0.0020	<0.005	<0.05	<0.05
Selenium	<0.01	<0.01	<0.010	<0.01	<0.002	<0.002
Silver	<0.005	<0.005	<0.0050	<0.01	<0.002	<0.002
Sodium	3.8	2.6	5.09	10	8.7	24
Strontium	0.04	0.036	0.0486	0.293	0.06	<0.05
Sulfate	7.1	10.1	2.46	7	6.7	6.3
Thallium	<0.001	<0.001	<0.0010	0.0112	<0.001	<0.001
Thorium	--	--	--	--	--	--
Tin	<0.01	<0.01	<0.010	<0.05	<0.05	<0.05
Titanium	<0.005	<0.005	<0.0050	<0.005	<0.05	<0.05
Total Dissolved Solids	63	62	118	509	89	120
Uranium	--	--	--	--	--	--
Vanadium	<0.005	<0.005	<0.0050	<0.02	<0.004	0.006
Zinc	<0.005	<0.005	<0.0050	1.100	0.037	<0.05
Acid Base Accounting						
Paste pH (s.u.)	--	--	--	--	--	--
AGP (tons CaCO3/kTon material)	0.3	<0.3	0.31	1.6	6.4	<0.3
ANP (tons CaCO3/kTon material)	66.7	715	126	5.3	30	760
NNP (tons CaCO3/kTon material)	68.4	715	126	3.7	23.6	760
Total Sulfur (wt%)	--	--	--	--	--	--

MWMP Tests for Sage Flats Pits

Sample	Units	Sample 1	Top TDC-2 10-20	Top TDC-2 90-100	Top TDC-2 110-120	Top TDC-2 120-130	Sample 2	Top MDC-2 190-199	Top MDC-2 180-190	Sample 3	Top TDC-2 320-330	Top TDC-2 310-320	Top TDC-4 140-150
Sample Date		12/21/1993	12/21/1993	12/21/1993	12/21/1993	12/21/1993	12/21/1993	12/21/1993	12/21/1993	12/21/1993	12/21/1993	12/21/1993	12/21/1993
Report Date		2/11/1994	2/11/1994	2/11/1994	2/11/1994	2/11/1994	2/11/1994	2/11/1994	2/11/1994	2/11/1994	2/11/1994	2/11/1994	2/11/1994
Location		Top	Top	Top	Top	Top	Mahoney	Mehoney	Mahoney	Top	Top	Top	Top
Hole Number		TDC-2	TDC-2	TDC-2	TDC-2	TDC-2	MDC-1	MDC-1	MDC-2	TDC-2	TDC-2	TDC-2	TDC-4
Interval		10-20, 90-100,	10-20	90-100	110-120	120-130	190-199, 180-190	190-199	180-190	320-330, 310-320,	320-330	310-320	140-150
Rock Type		Quartz Feldspar	Quartz Feldspar	Quartz Feldspar	Quartz Feldspar	Quartz Feldspar	Dolomitic	Dolomitic	Dolomitic	Dolomitic	Dolomitic	Dolomitic	Dolomitic
Alteration		Argillic	Argillic	Argillic	Argillic	Argillic	none	none	none	oxidized	oxidized	oxidized	oxidized
Lab													
MWMP Extraction													
Alkalinity, Total	mg/L as CaCO3	39.9	–	–	–	–	51.1	–	–	47.1	–	–	–
Aluminum	mg/L	0.671	–	–	–	–	0.234	–	–	0.324	–	–	–
Antimony	mg/L	<0.05	–	–	–	–	<0.05	–	–	<0.05	–	–	–
Arsenic	mg/L	<0.1	–	–	–	–	<0.05	–	–	<0.1	–	–	–
Barium	mg/L	0.104	–	–	–	–	0.091	–	–	0.074	–	–	–
Beryllium	mg/L	<0.001	–	–	–	–	<0.001	–	–	<0.001	–	–	–
Bismuth	mg/L	<0.035	–	–	–	–	<0.035	–	–	<0.035	–	–	–
Boron	mg/L						–	–	–	–	–	–	–
Cadmium	mg/L	<0.005	–	–	–	–	<0.005	–	–	<0.005	–	–	–
Calcium	mg/L	12.8	–	–	–	–	17	–	–	16.4	–	–	–
Chloride	mg/L	18.5	–	–	–	–	23.3	–	–	31.5	–	–	–
Chromium	mg/L	<0.01	–	–	–	–	<0.01	–	–	<0.01	–	–	–
Cobalt	mg/L	<0.005	–	–	–	–	<0.005	–	–	<0.005	–	–	–
Copper	mg/L	0.023	–	–	–	–	<0.005	–	–	<0.005	–	–	–
Cyanide (WAD)	mg/L	–	–	–	–	–	–	–	–	–	–	–	–
Fluoride	mg/L	0.196	–	–	–	–	0.089	–	–	0.055	–	–	–
Gallium	mg/L	<0.01	–	–	–	–	<0.1	–	–	<0.1	–	–	–
Iron	mg/L	2.25	–	–	–	–	<0.05	–	–	0.163	–	–	–
Lead	mg/L	<0.03	–	–	–	–	<0.03	–	–	<0.03	–	–	–
Lithium	mg/L	<0.005	–	–	–	–	<0.005	–	–	0.007	–	–	–
Magnesium	mg/L	1.89	–	–	–	–	7.6	–	–	6.24	–	–	–
Manganese	mg/L	0.029	–	–	–	–	<0.005	–	–	0.008	–	–	–
Mercury	mg/L	0.0005	–	–	–	–	0.0103	–	–	0.0005	–	–	–
Molybdenum	mg/L	<0.01	–	–	–	–	<0.01	–	–	<0.01	–	–	–
Nickel	mg/L	<0.015	–	–	–	–	<0.015	–	–	<0.015	–	–	–
Nitrate + Nitrite as N	mg/L	–	–	–	–	–	–	–	–	–	–	–	–
Nitrate as N	mg/L	0.887	–	–	–	–	0.379	–	–	0.151	–	–	–
Nitrite as N	mg/L	<0.01	–	–	–	–	0.012	–	–	<0.01	–	–	–
pH (s.u.)	SU	8.02	–	–	–	–	8.44	–	–	8.14	–	–	–
Phosphorus	mg/L	0.056	–	–	–	–	0.021	–	–	0.025	–	–	–
Potassium	mg/L	2.23	–	–	–	–	1.49	–	–	2.88	–	–	–
Scandium	mg/L	<0.01	–	–	–	–	<0.01	–	–	<0.01	–	–	–
Selenium	mg/L	<0.05	–	–	–	–	<0.05	–	–	<0.05	–	–	–
Silver	mg/L	<0.01	–	–	–	–	0.026	–	–	<0.01	–	–	–
Sodium	mg/L	17.5	–	–	–	–	8.96	–	–	13.2	–	–	–
Strontium	mg/L	0.026	–	–	–	–	0.017	–	–	0.036	–	–	–
Sulfate	mg/L	4.21	–	–	–	–	3.06	–	–	3.52	–	–	–
Thallium	mg/L	<0.1	–	–	–	–	<0.1	–	–	<0.1	–	–	–
Tin	mg/L	<0.1	–	–	–	–	<0.1	–	–	<0.1	–	–	–
Titanium	mg/L	<0.0005	–	–	–	–	<0.005	–	–	<0.005	–	–	–
Total Dissolved Solids	mg/L	106	–	–	–	–	123	–	–	122	–	–	–
Vanadium	mg/L	<0.007	–	–	–	–	<0.007	–	–	<0.007	–	–	–
Zinc	mg/L	0.015	–	–	–	–	<0.005	–	–	<0.005	–	–	–
Acid Base Accounting													
Paste pH (s.u.)	SU	8.09	8.16	8.29	7.56	7.77	8.11	8.23	7.99	8.78	11.4	8.57	10.5
AGP (tons CaCO3/kton)		0.94	0.63	0.63	0.94	1.25	0.62	0.63	0.94	0.62	0.63	0.63	<0.6
ANP (tons CaCO3/kton)		11.1	12.9	18.3	9.76	9.76	445	817	792	921	860	970	10.4
Total Sulfur (%)		–	0.02	0.02	0.04	0.03	–	0.02	0.02	–	0.02	<0.02	<0.02

MWMP Tests for Sage Flats Pits (continued)

Sample	Top TDC-4 270-280	Sage Waste Facility - Sed Oxid (SGWF_Sed_OX)	Sage Waste Facility - Int OX (SGWF_Int_OX)	Sage Waste Facility - Int OX	Sage Waste Facility - Sed Oxid	Sage Waste Facility	Sage Waste Facility	Sage Waste Facility	Sage Waste Facility	Sage Waste Facility	Sage Waste Facility	Sage Waste Facility	Sage Waste Facility
Sample Date	12/21/1993	12/17/2007	12/17/2007	3/19/2008	3/19/2008	12/3/2008	12/3/2008	1st Qtr. 2008	1st Qtr. 2008	2nd Qtr. 2008	2nd Qtr. 2008	3rd QTR 2008	3rd QTR 2008
Report Date	2/11/1994	12/17/2007	12/17/2007	3/19/2008	3/19/2008	12/3/2008	12/3/2008	3/19/2008	3/19/2008	6/23/2008	6/23/2008	9/25/2008	9/25/2008
Location	Top	Top	Top	SGWF_Int_OX	SGWF_Sed_OX	SGWF_Int_OX	SGWF_Sed_OX	SGWF_Int_OX	SGWF_Sed_OX	SGWF_Int_OX	SGWF_Sed_Red cd	SGWF_Int_OX	SGWF_Sed_OX
Hole Number	TDC-4	4th Qtr. 2007	4th Qtr. 2007	(1st Qtr Waste R)	(1st Qtr Waste R)	4th Qtr. 2008	4th Qtr. 2008						
Interval	270-280	SVL	SVL			SVL	SVL	SVL	SVL	SVL	SVL	SVL	SVL
Rock Type	Dolomitic	Nick/Ore Control	Nick/ Ore Control	NAtiemo	NAtiemo	Nick	Nick	Nick	Nick	Nick	Nick	Nick	Nick
Alteration	oxidized							39526	39526	39622	39622	39716	39716
Lab		W703124-05	W703124-06	W801278-02	W801278-03	W8L0154-01	W8L0154-02	W801278-02	W801278-03	W803452-02	W803452-03	W810548-01	W810548-02
MWMP Extraction													
Alkalinity, Total	--	72.5	51.7	76.8	89.6	112	170	76.8	89.6	69.8	209	101	52.7
Aluminum	--	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Antimony	--	0.0628	0.00788	<0.00300	0.0333	0.0646	0.0582	<0.00300	0.0333	0.0115	0.193	0.0212	0.0556
Arsenic	--	0.044	0.0107	0.0663	0.0869	0.117	0.0936	0.0663	0.0869	0.13	0.0864	0.0167	0.0365
Barium	--	0.0169	0.0114	0.141	0.111	0.137	0.0486	0.141	0.111	0.109	0.0991	0.139	0.0544
Beryllium	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.00200	<0.00200	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Bismuth	--												
Boron	--	0.118	<0.040	0.094	0.151	0.074	0.082	0.094	0.151	0.051	0.107	<0.040	0.043
Cadmium	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	--												
Chloride	--	1.93	0.88	2.9	3.87	1.73	11.9	2.9	3.87	5.15	23.6	2.16	4.21
Chromium	--	<0.0060	<0.0060	0.0297	<0.0060	<0.0060	<0.0060	0.0297	<0.0060	0.0065	<0.0060	<0.0060	<0.0060
Cobalt	--												
Copper	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	<0.010
Cyanide (WAD)	--									<0.0100	<0.0100		
Fluoride	--	0.283	0.231	0.459	0.611	0.44	0.413	0.459	0.611	1.14	0.196	<0.100	0.189
Gallium	--												
Iron	--	<0.060	<0.060	<0.060	0.063	<0.060	<0.060	<0.060	0.063	<0.060	<0.060	<0.060	<0.060
Lead	--	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Lithium	--												
Magnesium	--	2.94	1.36	1.17	1.67	4	16	1.17	1.67	1.02	49.5	10	5.37
Mangenese	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	--	<0.00020	<0.00020	<0.00020	0.00038	0.00232	0.00098	<0.00020	0.00038	<0.00020	0.00355	<0.00020	0.102
Molybdenum	--												
Nickel	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate + Nitrite as N	--												
Nitrate as N	--	1.87	0.318	1.7	0.676	4.33	<1.00	1.7	0.676	1.06	1.88	0.211	43.3
Nitrite as N	--												
pH (s.u.)	--	7.64	7.3	7.2	7.44	7.94	8.1	7.2	7.44	8.34	8.79	8.35	8.05
Phosphorus	--												
Potassium	--	7.05	3.16	3.39	12.9	8.82	4.06	3.39	12.9	3.82	5.27	1.4	3.89
Scandium	--												
Selenium	--	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Silver	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	--	8.48	4.03	21.8	19.9	8.48	9.93	21.8	19.9	25.7	9.37	1.89	4.19
Strontium	--												
Sulfate	--	8.46	3.39	15.1	20.7	17.8	7.87						
Thallium	--	0.0015	<0.00100	<0.00100	<0.00100	<0.00100	0.00283	<0.00100	<0.00100	<0.00100	0.00184	<0.00100	0.018
Tin	--												
Titanium	--												
Total Dissolved Solids	--												
Vanadium	--												
Zinc	--	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Acid Base Accounting													
Paste pH (s.u.)	8.88												
AGP (tons CaCO3/kton)	0.63	0	0	<0.3	<0.3	0	0	<0.3	<0.3	0	0	<0.03	<0.03
ANP (tons CaCO3/kton)	788	405.8	714.6	23.2	4.4	8	440	23.2	4.4	40.1	872	576	551
Total Sulfur (%)	<0.02	<0.01	<0.01	<0.01	<0.01	8	440	23.2	4.4	40.1	872	576	551

MWMP Tests for Sage Flats Pits (continued)

Sample	Sage Waste Facility	Sage Waste Facility
Sample Date	3rd QTR 2008	3rd QTR 2008
Report Date	9/25/2008	9/25/2008
Location	SGWF_Sed_Red cd	SGWF_Sed_Red cd2
Hole Number		
Interval	SVL	SVL
Rock Type	Nick	Nick
Alteration	39716	39716
Lab	W8I0548-03	W8I0548-04
MWMP Extraction		
Alkalinity, Total	189	94.4
Aluminum	<0.080	<0.080
Antimony	0.0149	0.021
Arsenic	0.0732	0.00884
Barium	0.0918	0.156
Beryllium	<0.0020	<0.0020
Bismuth		
Boron	0.096	0.045
Cadmium	<0.0020	<0.0020
Calcium		
Chloride	16.9	2.98
Chromium	<0.0060	<0.0060
Cobalt		
Copper	<0.010	<0.010
Cyanide (WAD)		
Fluoride	0.217	<0.100
Gallium		
Iron	<0.060	<0.060
Lead	<0.00300	<0.00300
Lithium		
Magnesium	23.7	11.8
Manganese	<0.0040	<0.0040
Mercury	0.00043	<0.00020
Molybdenum		
Nickel	<0.010	<0.010
Nitrate + Nitrite as N		
Nitrate as N	2.45	0.334
Nitrite as N		
pH (s.u.)	8.23	8.41
Phosphorus		
Potassium	2.05	2.01
Scandium		
Selenium	<0.00300	<0.00300
Silver	<0.0050	<0.0050
Sodium	18.1	2.49
Strontium		
Sulfate		
Thallium	0.00174	<0.00100
Tin		
Titanium		
Total Dissolved Solids		
Vanadium		
Zinc	<0.0100	<0.0100
Acid Base Accounting		
Paste pH (s.u.)		
AGP (tons CaCO3/kton)	<0.03	<0.03
ANP (tons CaCO3/kton)	581	828
Total Sulfur (%)	581	828

MWMP Tests for Rat Pits

Sample Name		N. Rat	N. Rat	OHW Rat Waste	OFW Rat WASTE	Rat	S. Rat	S. Rat	S. Rat	S. Rat	S. Rat	S. Rat
Quarterly Report		1st Quarter 1993	2nd Quarter 1993	2nd Quarter 1992	2nd Quarter 1992	4th Quarter 1992	1st Quarter 1993	2nd Quarter 93	3rd Quarter 93	4th Quarter 93	1st Quarter 94	2nd Quarter 94
Sample Date		3/4/1993	6/7/1993	5/26/1992	5/26/1992	11/25/1992	3/4/1993	6/7/1993	9/16/1993	12/14/1993	3/7/1994	5/24/1994
Sample Type	Units	Composite	Composite	6/24/1992	6/24/1992	Composite	Composite	Composite	Composite	Composite	Composite	Composite
Lab ID		93-A000423	93-A001461	5807	5808 ·	92-A001388	93-A000422	93-A001460	C-0042	93-A003686	94-A000658	94-A001978
MWMP Extraction												
Alkalinity, Total	mg/L as CaCO3	76.4	167	54.1	35.9	46.2	73.4	326	64	59.2	53.1	54.9
Alkalinity, Bicarbonate	mg/L as CaCO3	–	–	–	–	–	–	–	–	–	–	–
Aluminum	mg/L	0.099	1.47	0.084	0.139	0.309	<0.0100	2.31	<0.0500	1.03	0.0258	0.199
Antimony	mg/L	< 0.0500	< 0.0500	<0.05	<0.05	<0.05	< 0.0500	<0.0500	0.004	<0.0500	<0.0550	<0.0500
Arsenic	mg/L	< 0.0190	0.17	<0.01	<0.01	0.022	0.014	0.085	<0.0001	0.134	<0.0500	0.16
Barium	mg/L	0.435	0.186	0.128	0.06	0.136	0.358	0.158	3.51	0.226	0.366	0.249
Beryllium	mg/L	< 0.0010	0.006	<0.001	<0.001	<0.001	< 0.0010	<0.0010	<0.0100	<0.0010	<0.0010	<0.0010
Bismuth	mg/L	< 0.0350	< 0.0350	<0.035	<0.035	<0.035	< 0.0350	<0.0350	<0.1000	<0.0350	<0.0350	<0.0350
Boron	mg/L	–	–	0.167	0.141	–	–	–	–	–	–	–
Cadium	mg/L	< 0.0050	<0.0050	<0.007	<0.007	<0.01	< 0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Calcium	mg/L	76.5	63.1	16.6	12.1	16.6	24.2	45.2	472	30.5	28.4	21.2
Chloride	mg/L	4	3.45	<0.25	0.61	1.11	0.5	1.26	1	0.37	<0.0100	1.66
Chromium	mg/L	< 0.0100	0.13	<0.01	<0.01	<0.01	< 0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt	mg/L	< 0.0050	0.008	<0.007	<0.007	<0.005	< 0.0050	<0.0050	<0.0100	<0.0050	<0.0050	<0.0050
Copper ·	mg/L	< 0.0050	0.016	<0.007	<0.007	0.007	< 0.0050	<0.0050	<0.0100	0.009	<0.0050	<0.0050
Cyanide (WAD)	mg/L	–	–	–	–	–	–	–	–	–	–	–
Fluoride	mg/L	0.165	0.47	<0.1	<0.1	0.198	0.13	0.35	0.4	0.201	0.286	3.23
Gallium	mg/L	< 0.1000	< 0.1000	<0.02	<0.02	<0.1	< 0.1000	<0.1000	<0.1000	<0.1000	<0.1000	<0.1000
Iron	mg/L	0.24	2.04	0.02	0.054	0.276	0.63	1.96	<0.0200	3.15	<0.0500	<0.3830
Lead	mg/L	< 0.0050	< 0.0300	<0.05	<0.05	<0.005	< 0.0050	<0.0300	<0.0010	<0.0300	<0.0300	<0.0300
Lithium	mg/L	0.007	0.015	<0.005	<0.005	<0.005	< 0.0050	<0.0050	<0.0500	<0.0100	0.005	0.009
Magnesium	mg/L	22.1	9.23	2	0.687	6.3	7.98	7.24	66.3	6.17	6.19	6.25
Manganese	mg/L	0.014	0.079	0.007	0.008	0.008	0.019	0.068	0.06	0.058	<0.0050	0.005
Mercury	mg/L	< 0.0002	< 0.0003	0.000689	0.000669	<0.0005	0.0003	<0.0003	<0.0002	0.0005	<0.0002	<0.0002
Molybdenum	mg/L	< 0.0100	0.053	<0.015	<0.015	<0.01	< 0.0100	0.011	<0.0100	<0.0100	<0.0150	<0.0100
Nickel	mg/L	< 0.0150	< 0.0150	<0.015	<0.015	–	< 0.0150	<0.0150	<0.0100	<0.0150	<0.0150	<0.0150
Nitrate + Nitrite as N	mg/L	–	–	–	–	7.57	–	–	–	–	–	–
Nitrate as N	mg/L	–	–	0.5	1	–	–	–	–	–	–	–
Nitrite as N	mg/L	–	–	–	–	–	–	–	–	–	–	–
pH (s.u.)	SU	8.06	8.44	7.2	6.8	8.38	8.43	8.34	8.2	8.41	8.07	8.27
Phosphorus	mg/L	0.065	0.148	0.029	0.045	<0.026	0.06	0.087	<0.0500	0.111	<0.0100	0.017
Potassium	mg/L	6.68	8.06	<1.5	<1.5	2.37	2.48	3.74	15.9	2.46	3.16	3.86
Scandium	mg/L	< 0.0100	0.011	<0.01	<0.01	<0.01	< 0.0100	<0.0100	<0.0500	<0.0100	<0.0100	<0.0100
Selenium	mg/L	< 0.0050	< 0.0050	<0.005	<0.005	<0.005	< 0.0050	<0.0050	<0.0020	<0.0500	<0.0500	<0.0500
Silver	mg/L	< 0.0100	< 0.0100	<0.02	<0.02	<0.01	< 0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Sodium	mg/L	7.95	12.1	3.47	4.2	4.06	1.47	6.68	7.68	3.97	6.94	4.48
Strontium	mg/L	0.244	0.141	0.009	0.036	0.038	0.031	0.188	1.99	0.064	0.122	0.101
Sulfate	mg/L	5.92	15.1	3.3	3.82	7.72	5.07	11.2	15	4.6	16.4	11
Thallium	mg/L	< 0.0050	< 0.0050	<0.15	<0.15	<0.005	< 0.0050	<0.0050	<0.0100	<0.1000	<0.0100	<0.1000
Tin	mg/L	< 0.1000	< 0.1000	<1.3	<1.3	<0.2	< 0.1000	<0.1000	<0.1000	<0.1000	<0.1000	<0.1000
Titanium	mg/L	0.005	0.021	<0.001	0.001	<0.005	< 0.0050	0.052	<0.0100	0.015	0.005	<0.0050
Total Dissolved Solids	mg/L	504	172	119	64	137	164	112	166	206	151	130
Vanadium	mg/L	< 0.0070	0.016	<0.007	<0.007	<0.007	< 0.0070	0.008	<0.0100	0.011	<0.0070	<0.0070
Zinc	mg/L	< 0.0050	0.023	0.008	<0.005	<0.005	0.009	0.013	0.005	0.031	<0.0130	0.013
Acid Base Accounting												
Paste pH (s.u.)		8.73	8.56	8.15	7.98	8.85	8.31	8.71	8.2	8.57	8.36	8.33
AGP (tons CaCO3/kton)		< 0.6000	0.62	1	1	0.94	0.63	0.94	0.6	0.94	<3.47	1.88
ANP (tons CaCO3/kton)		633	401	938	544	703	773	470	537	563	399	318
NNP (tons CaCO3/kton)		633	400.38	937	543	702.06	772.37	469.06	536.4	562.06	396	316.12

MWMP Tests for Rat Pits (continued)

Sample Name	S. Rat	S. Rat	S. Rat	S. Rat	Stage (Rat)	Stage (Rat)	Stage (Rat)	Stage (Rat)	Stage (Rat)	Stage (Rat)	Stage (Rat)	Stage (Rat)
Quarterly Report	3rd Quarter 1994	4th Quarter 1994	2nd Quarter 1996	3rd Quarter 1996	1st Quarter 1993	2nd Quarter 1993	3rd Quarter 1993	4th Quarter 1993	1st Quarter 1994	1st Quarter 1995	2nd Quarter 1995	3rd Quarter 1995
Sample Date	9/23/1994	11/19/1994	6/14/1996	8/7/1996	3/4/1993	6/7/1993	9/16/1993	12/14/1993	3/7/1994	2/23/1995	6/14/1995	8/31/1995
Sample Type	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	7/10/1995	Composite
Lab ID	94-A003348	94-A004114			93-A000424	93-A001462	C0042	A003687	A94-A000657	SP032701	95-A001260	95-A002410
MWMP Extraction												
Alkalinity, Total	57	67.1	48	57	72.9	24	92	53.2	52.1	83.8	67.9	63.6
Alkalinity, Bicarbonate	–	–	48	–	–	–	–	–	–	–	67.9	63.6
Aluminum	0.3	0.2	0.06	<0.01	< 0.3770	0.691	<0.0500	0.707	0.274	0.159	0.45	0.554
Antimony	<0.1	<0.1	0.004	0.026	< 0.0500	< 0.0500	< 0.0030	< 0.0500	< 0.0500	< 0.0250	<0.2	0.016
Arsenic	<0.2	<0.1	0.13	0.17	0.068	0.099	0.019	0.143	< 0.0500	0.036	<0.1	<0.1
Barium	0.305	0.253	0.092	<0.1	0.052	0.081	3.52	0.233	0.309	0.102	0.051	0.094
Beryllium	<0.005	<0.005	<0.0002	<0.1	< 0.0010	< 0.0010	< 0.0100	< 0.0010	< 0.0010	< 0.0060	<0.005	0.009
Bismuth	<0.035	<0.035	<0.05	<0.1	< 0.0350	< 0.350	< 0.1000	< 0.0350	< 0.0350	< 0.0050	<0.035	<0.035
Boron	–	–	–	–	–	–	–	–	–	–	–	–
Cadium	<0.005	<0.005	<0.001	<0.001	<0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	0.001	<0.005	<0.005
Calcium	31.6	23.2	<11.1	34	27.7	31.6	940	58.9	24	22.2	17.7	20.6
Chloride	2.52	1.55	<1	2	7.5	2.23	2	2.23	11.4	7.3	2.11	3.15
Chromium	<0.1	<0.1	<0.001	<0.1	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.001	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.002	<0.1	< 0.0050	< 0.0050	< 0.0100	< 0.0050	< 0.0050	0.004	<0.005	0.01
Copper	<0.005	<0.005	0.017	<0.1	< 0.0050	< 0.0050	< 0.0100	0.008	< 0.0050	0.001	0.006	0.01
Cyanide (WAD)	–	–	–	279	–	–	–	–	–	–	–	<0.005
Fluoride	0.362	0.357	0.5	0.4	0.327	0.37	0.4	0.287	0.274	0.52	0.846	1.25
Gallium	<0.1	<0.1	<0.01	<0.1	< 0.1000	< 0.1000	< 0.1000	< 0.1000	< 0.1000	0.017	<0.1	<0.1
Iron	0.054	0.055	0.008	<0.1	0.774	3.44	< 0.0200	3.74	< 0.0500	0.204	0.433	<0.05
Lead	<0.03	<0.03	<0.005	<0.005	< 0.0050	< 0.0300	< 0.0010	< 0.0300	< 0.0300	0.043	<0.03	<0.03
Lithium	0.008	<0.005	0.003	<0.1	< 0.0050	0.01	< 0.0500	< 0.0100	< 0.0050	0.021	0.006	0.02
Magnesium	14.1	5.54	5.47	30	3.56	7.48	113	8.83	< 7.6200	5.12	7.23	11.9
Manganese	0.006	<0.005	0.003	<0.1	0.016	0.043	0.16	0.078	0.005	0.005	0.008	0.011
Mercury	<0.0002	<0.0002	0.0004	<0.0005	0.0005	< 0.0003	< 0.0002	<0.0002	< 0.0002	< 0.0002	0.0002	0.0003
Molybdenum	0.019	0.011	0.02	<0.1	< 0.0100	0.017	< 0.0100	0.014	< 0.0100	0.001	<0.01	0.036
Nickel	<0.015	<0.015	<0.002	<0.1	< 0.0150	< 0.0150	0.02	< 0.0150	< 0.0150	0.009	<0.015	<0.015
Nitrate + Nitrite as N	–	–	1.83	0.2	–	–	–	–	–	–	4.69	6.6
Nitrate as N	–	–	–	–	–	–	–	–	–	–	–	–
Nitrite as N	–	–	–	–	–	–	–	–	–	–	–	–
pH (s.u.)	8.04	8.32	8.27	8.14	8.15	8.33	8.47	8.25	8.2	8.1	8.17	7.89
Phosphorus	0.032	0.025	0.07	<0.1	0.143	< 0.1000	< 0.0500	0.029	0.012	< 0.0200	0.028	<0.025
Potassium	6.5	3.08	5.08	17	3.79	5.79	34.2	5.46	4.72	2.72	4.02	8.08
Scandium	<0.01	<0.01	<0.005	<0.1	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	0.001	<0.1	0.018
Selenium	<0.1	<0.1	<0.002	0.018	< 0.0050	< 0.0050	0.004	< 0.0500	< 0.0500	0.038	<0.1	<0.1
Silver	<0.01	<0.01	<0.002	<0.002	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0250	<0.01	<0.01
Sodium	4.88	5.68	2.14	4.7	7.72	5.44	9.2	4.43	8.8	6.64	10.3	7.71
Strontium	0.195	0.086	0.56	0.2	0.07	0.089	1.25	0.144	0.101	0.089	0.066	0.112
Sulfate	15.5	7.74	7	130	4.93	12.5	< 18.0000	7.98	6.49	8.13	7.17	40.8
Thallium	<0.1	<0.1	<0.001	<0.001	< 0.0050	< 0.0050	< 0.0100	< 0.1000	< 0.1000	0.252	<0.1	<0.002
Tin	<0.1	<0.1	<0.02	<0.5	< 0.1000	< 0.1000	< 0.1000	< 0.1000	< 0.1000	< 0.0080	<0.1	<0.1
Titanium	<0.005	<0.005	<0.002	<0.1	< 0.0050	0.009	< 0.0100	0.012	< 0.0050	0.018	0.008	0.009
Total Dissolved Solids	216	128	48	279	208	168	182	117	159	129	<0.007	83
Vanadium	<0.007	<0.007	<0.002	<0.1	< 0.0070	< 0.0070	< 0.0100	0.0009	< 0.0070	0.002	120	0.011
Zinc	0.009	0.01	0.005	<0.1	0.008	0.023	0.006	0.033	0.012	0.046	<0.005	0.015
Acid Base Accounting												
Paste pH (s.u.)	7.81	8.71	8.86	9.83	8.19	8.65	8.47	8.63	8.42	10.67	9.34	9.06
AGP (tons CaCO3/kton)	5	2.81	3.53	19	3.13	1.88	0.3	2.5	1.88	0.9	1.25	2.66
ANP (tons CaCO3/kton)	677	406	438	742	305	521	539	663	646	889.1	846	626
NNP (tons CaCO3/kton)	672	403.19	434.47	723	301.87	519.12	538.7	660.5	644.12	888.2	844.75	623.34

MWMP Tests for Rat Pits (continued)

Sample Name	Stage (Rat)	RAT Waste Facility - Sed OX (RWF_Sed_OX)	RAT Waste Facility - Sed OX (RWF_Sed_OX)	RAT Waste Facility - Sed OX (RWF_Sed_OX)	RAT Waste Facility - Sed OX (RWF_Sed_OX)	RAT Waste Facility - Sed OX (RWF_Sed_OX)	RAT Waste Facility - Sed OX	RAT Waste Facility
Quarterly Report	4th Quarter 1995	4th Qtr. 2006	1st Qtr. 2007	2nd Qtr. 2007	3rd Qtr. 2007	4th Qtr. 2007	RWF_Sed_OX	RWF_Sed_OX
Sample Date	12/5/1995	12/28/06	03/16/07	06/12/07	09/13/07	12/17/07	1st QTR 2008	1st Qtr. 2008
Sample Type	Composite	Nick	Nick/Ore Control	Nick/Ore Control	Nick/Ore Control	Nick/Ore Control	3/19/2008	3/19/2008
Lab ID	95-A003469	E556619	E565821	E581646	W701328-06	W703124-04	W801278-04	W801278-04
MWMP Extraction								
Alkalinity, Total	55.1	119	44.3	88.4	53.2	55.5	89.2	89.2
Alkalinity, Bicarbonate	55.1	109	44.3	81.9	47	55.5	89.2	89.2
Aluminum	<0.075	<0.080	<0.080	<0.08	<0.080	0.103	<0.080	<0.080
Antimony	<0.02	0.0124	0.0032	0.0128	0.00834	0.00305	0.0164	0.0164
Arsenic	0.069	<0.025	0.0136	0.016	0.0051	<0.00300	0.0193	0.0193
Barium	0.085	0.245	0.146	0.262	0.242	0.165	0.218	0.218
Beryllium	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Bismuth	<0.011	<0.06						
Boron	–	<0.04	0.17	<0.040	<0.040	<0.040	0.074	0.074
Cadium	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	25.3							
Chloride	8.28	2.55	1.13	4.39	3.71	2.18	4.97	4.97
Chromium	<0.003	<0.0060	<0.0060	<0.006	<0.0060	<0.0060	<0.0060	<0.0060
Cobalt	<0.001	<0.006						
Copper	0.003	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cyanide (WAD)	–	<0.010	<0.010	<0.010				
Fluoride	0.696	<0.100	0.41	0.12	<0.100	0.391	0.13	0.13
Gallium	<0.006	<0.020						
Iron	0.097	<0.06	<0.06	<0.06	<0.060	<0.060	<0.060	<0.060
Lead	0.015	<0.0075	<0.0075	0.0109	<0.00300	<0.00300	<0.00300	<0.00300
Lithium	0.008	<0.020						
Magnesium	12.5	23.3	3.05	18.7	8.9	1.25	14.9	14.9
Manganese	0.003	<0.004	<0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	0.021	0.01						
Nickel	<0.006	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate + Nitrite as N	–							
Nitrate as N	12.7	4.06	7.53	3.06	0.663	3.1	0.278	
Nitrite as N	0.267							0.278
pH (s.u.)	8.18						8.08	8.08
Phosphorus	<0.025	<0.05						
Potassium	7.47	2	2.3	3.13	3.25	7.62	2.99	2.99
Scandium	<0.001							
Selenium	<0.04	<0.04	0.004	<0.0030	<0.00300	<0.00300	<0.00300	<0.00300
Silver	<0.01	<0.0050	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	4.78	6.1	2.77	3.84	2.86	2.58	13.1	13.1
Strontium	0.112	0.041						
Sulfate	29.8	14.9	11.6	13.8	11.3	12.1	19.7	19.7
Thallium	<0.002	<0.0020	<0.00200	<0.00200	<0.00100	<0.00100	<0.00100	<0.00100
Tin	<0.1	<0.05						
Titanium	<0.005	<0.0050						120
Total Dissolved Solids	173							
Vanadium	<0.007	0.0106						
Zinc	0.003	<0.010	<0.010	<0.010	<0.0100	<0.0100	<0.0100	<0.0100
Acid Base Accounting								
Paste pH (s.u.)	8.77	8.46	7.35	8.59	8.61	7.74		
AGP (tons CaCO3/kton)	5.62	<0.3	<0.3	<0.3	0	0	<0.3	<0.3
ANP (tons CaCO3/kton)	364	857	711	913	965.44	502.8	931	931
NNP (tons CaCO3/kton)	358.38	857	711	913	965.44	502.8	931	931

MWMP Tests for Saga Pits

Station Name	Units	Saga Waste Facility Sed Redcd	Saga Waste Facility Sed Oxid	Saga Waste Facility Int Oxide	Saga Waste Facility Sed Oxid	Saga Waste Facility Sed Oxide	Saga Waste Facility Sed Redcd	Saga Waste Facility	Saga Waste Facility	Saga Waste Facility	Saga Waste Facility	Saga Waste Facility
Stn.Code		SWF_Sed_Redcd	SWF_Sed_OX	SWF_Int_OX	SWF_Sed_OX	SWF_Sed_OX	SWF_Sed_Redcd	SWF_Sed_OX	SWF_Sed_OX	SWF_Sed_Redcd	SWF_Sed_OX	SWF_Sed_OX
Sampling Session		4th Qtr. 2007	4th Qtr. 2007	3rd Qtr. 2007	1st Qtr Waste R	2nd Qtr. 2008	2nd QTR 2008	1st Qtr. 2008	2nd Qtr. 2008	2nd Qtr. 2008	3rd QTR 2008	4th Qtr. 2008
Collect Date/Time		12/17/07	12/17/07	09/13/07	03/19/08	06/23/08	06/23/08	03/19/08	06/23/08	06/23/08	09/25/08	12/03/08
Lab Name		SVL	SVL	SVL	SVL	SVL	SVL	SVL	SVL	SVL	SVL	SVL
Sampled By		Nick/Ore Control	Nick/Ore Control	Nick/Ore Control	NAtiemo	Nick	Nick	Nick	Nick	Nick	Nick	Nick
Lab Test Date	Units	12/17/2007	12/17/2007	9/13/2007	3/19/2008	6/23/2008	6/23/2008	3/19/2008	6/23/2008	6/23/2008	9/25/2008	12/3/2008
Lab Reference Number		W703124-03	W703124-02	W701328-05	W801278-01	W803452-04	W803452-01	W801278-01	W803452-04	W803452-01	W8I0548-05	W8L0154-07
MWMP Extraction												
Alkalinity, Total	mg/L as CaCO3	60	67.6	113	63.8	89.9	48	63.8	89.9	48	62.2	86.5
Alkalinity, Bicarbonate	mg/L as CaCO3	60	67.6	107	63.8	87.8	48	63.8	87.8	48	62.2	86.5
Aluminum	mg/L	<0.080	<0.080	0.618	0.435	0.392	<0.080	0.435	0.392	<0.080	<0.080	0.183
Antimony	mg/L	<0.00300	0.0846	0.00407	0.0103	0.00388	0.127	0.0103	0.00388	0.127	<0.00300	0.0142
Arsenic	mg/L	0.00526	0.054	0.252	0.0116	0.0591	0.0135	0.0116	0.0591	0.0135	0.0169	0.0257
Barium	mg/L	0.0194	0.199	0.0637	0.146	0.0504	0.206	0.146	0.0504	0.206	0.209	0.101
Beryllium	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.00200
Bismuth	mg/L											
Boron	mg/L	<0.040	0.044	0.404	0.067	0.393	0.065	0.067	0.393	0.065	0.051	0.078
Cadium	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	mg/L											
Chloride	mg/L	8.31	1.03	50.8	1.38	92.6	3.63	1.38	92.6	3.63	3.68	8.34
Chromium	mg/L	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Cobalt	mg/L											
Copper	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cyanide (WAD)	mg/L					<0.0100	<0.0100		<0.0100	<0.0100		
Fluoride	mg/L	0.248	1.52	1.98	0.433	1.09	0.64	0.433	1.09	0.64	0.442	1.04
Gallium	mg/L											
Iron	mg/L	<0.060	<0.060	0.2	0.079	0.098	<0.060	0.079	0.098	<0.060	<0.060	<0.060
Lead	mg/L	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	0.00382	<0.00300	<0.00300	0.00382	<0.00300	<0.00300
Lithium	mg/L											
Magnesium	mg/L	221	1.2	4.17	4.04	7.55	1.6	4.04	7.55	1.6	1.55	2.43
Manganase	mg/L	0.502	<0.0040	0.0049	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.00020	<0.00020	0.00023	<0.00020	0.00077	0.00194
Molybdenum	mg/L											
Nickel	mg/L	0.275	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate + Nitrite as N	mg/L											
Nitrate as N	mg/L	13.7	2.12	1.83	1.42	3.75	4.11					
Nitrite as N	mg/L							1.42	3.75	4.11	5.94	1.29
pH (s.u.)	SU	7.23	8.1	8.43	7.01	8.4	8.28	7.01	8.4	8.28	8.25	8.11
Phosphorus	mg/L											
Potassium	mg/L	26.2	5.49	3.51	10.1	5.15	8.79	10.1	5.15	8.79	5.88	14.9
Scandium	mg/L											
Selenium	mg/L	0.0517	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Silver	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	mg/L	21.6	6.9	170	6.81	117	5.77	6.81	117	5.77	14.6	20
Strontium	mg/L											
Sulfate	mg/L	1830	18.8	172	40	143	19.4	40	143	19.4	23.9	47.4
Thallium	mg/L	0.00796	0.00197	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Tin	mg/L											
Titanium	mg/L											
Total Dissolved Solids	mg/L							140				
Vanadium	mg/L											
Zinc	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Acid Base Accounting												
Paste pH (s.u.)												
AGP (tons CaCO3/kton)		56.85	7	2.87	8.53	0	0	8.53	0	0	<0.03	3.94
ANP (tons CaCO3/kton)		306.3	71.5	53.78	<0.3	185	791	<0.3	185	791	258	3.5
NNP (tons CaCO3/kton)		249.4	64.5	50.91	-8.53	185	791	-8.53	185	791	258	-0.44

MWMP Tests for LJ Pits

Sample ID		LJC-3-1-M	LJC-4-2-M	SRC-1-2-M	LJC-6-1-A	LJC-3-1-A	LJC-8-1-A	LJC-5-2-A	LJC-4-2-A	LJC-8-2-A	SRC-1-2-A	SRC1135140D	LJC2170175D
Sample Location		LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge
Sample Type		drillhole composite	drillhole composite	drillhole composite	drillhole composite	drillhole composite	drillhole composite	drillhole composite	drillhole composite	drillhole composite	drillhole composite	drillhole composite	drillhole composite
Drill Hole		LJC-3	LJC-4-2-M	SRC-1	LJC-6	LJC-3	LJC-8	LJC-5	LJC-4-2-A	LJC-8	SRC-1-2-A	SRC-1	LJC-2
Interval		35-40	175-180	25-30	140-145	40-45	245-250	80-85	170-175	380-385	20-25	135-140	170-175
Formation		Hamburg	Hamburg	Hamburg	Hamburg	Hamburg	Hamburg	Dunderberg	Dunderberg	Dunderberg	Dunderberg	Dunderberg	Dunderberg
Rock Type		Limestone	Silty Limestone	Silty Limestone	Silty Limestone	Limestone	Limestone	Silty Limestone	Silty Limestone	Silty Limestone	Silty Limestone	Silty Limestone	Silty Limestone
Alteration		argillic	carbonaceous	none	argillic	argillic	none	carbonaceous	carbonaceous	carbonaceous	none	carbonaceous	carbonaceous
Mineralization		none	0.1% py	0.1% py	trace py	none	0.5 py/arsenopy	trace py	trace py	trace py	0.1% py	trace py	none
Reporting Period		--	--	--	--	--	--	--	--	--	--	--	--
Sample Date	Units	1/31/1996	1/31/1996	1/31/1996	1/31/1996	1/31/1996	1/31/1996	1/31/1996	1/31/1996	1/31/1996	1/31/1996	3/29/1996	3/29/1996
Lab ID		--	--	--	--	--	--	--	--	--	--	--	--
MWMP Extraction													
Alkalinity, Total	mg/L as CaCO3	17.9	12.1	15.8	--	--	--	--	--	--	--	29	35
Alkalinity, Bicarbonate	mg/L as CaCO3	17.9	12.1	15.8	--	--	--	--	--	--	--	29	35
Aluminum	mg/L	0.231	0.15	0.125	--	--	--	--	--	--	--	0.16	0.2
Antimony	mg/L	0.003	<0.002	0.006	--	--	--	--	--	--	--	<0.08	<0.08
Arsenic	mg/L	0.006	<0.005	0.016	--	--	--	--	--	--	--	0.051	0.01
Barium	mg/L	0.024	0.018	0.019	--	--	--	--	--	--	--	0.01	0.03
Beryllium	mg/L	<0.002	<0.002	<0.002	--	--	--	--	--	--	--	<0.001	<0.001
Bismuth	mg/L	<0.011	<0.011	<0.011	--	--	--	--	--	--	--	<0.2	<0.2
Boron	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	mg/L	<0.002	<0.002	<0.002	--	--	--	--	--	--	--	<0.005	<0.005
Calcium	mg/L	6.04	5.02	4.11	--	--	--	--	--	--	--	8.3	8
Chloride	mg/L	<1.5	<1.5	<1.5	--	--	--	--	--	--	--	<1	<1
Chromium	mg/L	<0.003	<0.003	0.003	--	--	--	--	--	--	--	<0.005	<0.005
Cobalt	mg/L	<0.001	<0.001	0.003	--	--	--	--	--	--	--	<0.01	<0.01
Copper	mg/L	0.009	0.003	0.01	--	--	--	--	--	--	--	<0.01	<0.01
Cyanide (WAD)	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
Fluoride	mg/L	0.022	0.019	0.023	--	--	--	--	--	--	--	<0.5	<0.5
Gallium	mg/L	<0.006	<0.006	<0.006	--	--	--	--	--	--	--	<0.05	<0.05
Iron	mg/L	0.055	<0.05	<0.05	--	--	--	--	--	--	--	<0.01	0.04
Lead	mg/L	<0.002	0.01	<0.002	--	--	--	--	--	--	--	<0.005	<0.005
Lithium	mg/L	<0.002	<0.002	0.003	--	--	--	--	--	--	--	<0.01	<0.01
Magnesium	mg/L	0.572	0.36	0.332	--	--	--	--	--	--	--	0.7	2.9
Manganese	mg/L	0.009	0.004	0.01	--	--	--	--	--	--	--	<0.01	<0.01
Mercury	mg/L	<0.0002	<0.0002	<0.0002	--	--	--	--	--	--	--	<0.0002	0.0002
Molybdenum	mg/L	0.008	<0.004	<0.004	--	--	--	--	--	--	--	<0.02	<0.02
Nickel	mg/L	<0.006	<0.006	<0.006	--	--	--	--	--	--	--	<0.01	<0.01
Nitrate + Nitrite as N	mg/L	--	--	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/L	0.02	<0.01	0.02	--	--	--	--	--	--	--	0.03	0.03
Nitrite as N	mg/L	<0.01	<0.01	<0.01	--	--	--	--	--	--	--	<0.01	<0.01
pH (s.u.)	SU	7.32	7.59	7.43	--	--	--	--	--	--	--	8.01	7.94
Phosphorus	mg/L	<0.025	<0.025	<0.025	--	--	--	--	--	--	--	0.01	<0.01
Potassium	mg/L	<1	<1	<1	--	--	--	--	--	--	--	0.8	1.3
Scandium	mg/L	0.002	<0.001	<0.001	--	--	--	--	--	--	--	<0.02	<0.02
Selenium	mg/L	<0.002	<0.002	<0.002	--	--	--	--	--	--	--	<0.002	<0.002
Silver	mg/L	<0.01	<0.01	<0.01	--	--	--	--	--	--	--	<0.005	<0.005
Sodium	mg/L	1.15	1.26	2.52	--	--	--	--	--	--	--	1.6	1.1
Strontium	mg/L	0.019	0.021	0.025	--	--	--	--	--	--	--	0.05	0.08
Sulfate	mg/L	<1	<1	1.87	--	--	--	--	--	--	--	<5	<5
Thallium	mg/L	<0.002	<0.002	<0.002	--	--	--	--	--	--	--	<0.001	<0.001
Tin	mg/L	<0.1	<0.1	<0.1	--	--	--	--	--	--	--	<0.1	<0.1
Titanium	mg/L	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	<0.01	<0.01
Total Dissolved Solids	mg/L	20	20	26	--	--	--	--	--	--	--	<5	20
Vanadium	mg/L	<0.007	<0.007	<0.007	--	--	--	--	--	--	--	<0.01	<0.01
Zinc	mg/L	0.005	<0.002	0.004	--	--	--	--	--	--	--	0.06	<0.01
Acid Base Accounting													
AGP (tons CaCO3/kton)		1	3.25	1.31	3.88	0.91	1.41	2.94	3.75	1.16	3.81	--	--
ANP (tons CaCO3/kton)		867	822	488	938	994	829	540	612	580	686	--	--
NNP (tons CaCO3/kton)		866	818.75	486.69	934.12	993.09	827.59	537.06	608.25	578.84	682.19		
Paste pH (s.u.)		10.8	11.5	10.7	10.4	11.1	11.5	10.9	10.6	10.3	10.9	--	--

MWMP Tests for LJ Pits (continued)

Sample ID	LJC103540H	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge
Sample Location	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge	LJ Ridge
Sample Type	drillhole composite												
Drill Hole	LJC-10												
Interval	35-40	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite	Composite
Formation	Hamburg												
Rock Type	Limestone												
Alteration	argillic												
Mineralization	none												
Reporting Period	–	4th Quarter 1997	2nd Quarter 1998	2nd Quarter 1998	2nd Quarter 1998	4th Quarter 1998	1st Quarter 1999	3rd Quarter 1999	4th Quarter 1999	1st Quarter 2000	2nd Quarter 2000	3rd Quarter 2000	4th Quarter 2000
Sample Date	3/29/1996	18-Nov-97	Mar-98	Apr-98	May-98	9-Oct-98	06-22-99	08-31-99	Nov-99	6-Mar-00	4-Jun-00	16-Aug-00	21-Nov-00
Lab ID	–	974205-1	982392-3	982392-1	982392-2	983449	992239-2	9909095-1A	9912090	E228254	E234754	E241835	249832
MWMP Extraction													
Alkalinity, Total	26	42	68	54	40	56	16	32	23	23.8	40.1	24.7	61.2
Alkalinity, Bicarbonate	26	–	–	–	–	–	–	–	–	–	–	–	–
Aluminum	0.07	0.1	0.02	0.03	0.06	0.05	0.07	0.047	ND	0.03	0.128	0.051	0.1
Antimony	<0.08	0.032	<0.003	0.0040	0.0430	0.087	<0.003	ND	ND	<0.002	<0.002	<0.002	<0.005
Arsenic	<0.005	0.023	0.0160	0.0520	0.0460	0.059	<0.003	ND	0.0041	0.001	0.019	<0.04	0.03
Barium	0.02	0.27	0.1100	0.06	0.09	0.19	<0.02	0.012	0.26	0.006	0.009	0.01	0.016
Beryllium	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	ND	ND	<0.002	<0.002	<0.002	<0.002
Bismuth	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.024	0.094	0.049	<0.02
Boron	–	–	–	–	–	0.3	<0.1	–	–	0.084	0.066	0.062	0.08
Cadmium	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	ND	ND	<0.0024	<0.0024	<0.002	<0.002
Calcium	8	14	15.1	11.6	9.22	14.20	5.54	3.2	6.2	7.07	7.48	7.54	15.4
Chloride	<1	<4	8	<4	<4	4	<4	ND	ND	0.2	0.3	0.3	1.1
Chromium	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	<0.005	<0.005	<0.006	<0.008
Cobalt	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	<0.005	<0.005	<0.006	<0.006
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	ND	0.013	<0.003	<0.003	<0.003	0.005
Cyanide (WAD)	–	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	<0.01	<0.01	<0.01	<0.01
Fluoride	<0.5	0.3	0.3	0.3	0.3	0.5	<0.1	ND	ND	<0.1	<0.1	<0.1	0.3
Gallium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	ND	ND	<0.022	<0.022	<0.022	<0.02
Iron	<0.01	<0.1	0.02	0.01	0.02	<0.05	<0.1	ND	ND	<0.02	<0.02	<0.02	<0.02
Lead	<0.005	<0.003	<0.002	<0.002	<0.002	<0.002	0.003	ND	ND	<0.002	<0.002	<0.002	<0.005
Lithium	<0.01	<0.02	0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	<0.003	<0.003	<0.004	<0.004
Magnesium	0.6	1.8	10.5	5.43	4.08	3.18	0.77	0.6	1.1	0.854	0.69	0.653	5.36
Manganese	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	ND	ND	<0.002	<0.002	<0.002	0.003
Mercury	<0.0002	0.0011	0.001	<0.0002	<0.0002	<0.0002	<0.0002	ND	ND	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	ND	ND	<0.008	0.015	<0.008	0.021
Nickel	<0.01	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	ND	ND	<0.023	<0.023	<0.024	<0.005
Nitrate + Nitrite as N	–	3	4.98	0.74	1.71	4.79	<0.05	0.27	0.15	–	–	0.21	–
Nitrate as N	<0.02	–	–	–	–	–	–	–	–	–	–	–	–
Nitrite as N	<0.01	–	–	–	–	–	–	–	–	–	–	–	–
pH (s.u.)	7.81	7.27	8.36	7.46	8.48	8.24	7.01	7.64	–	7.47	7.92	7.81	7.11
Phosphorus	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	ND	ND	<0.074	<0.074	<0.13	<0.05
Potassium	0.4	<5	5	5	5	4	<1	ND	ND	<1.7	<1.7	<1.7	2
Scandium	<0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	ND	ND	<0.002	<0.002	<0.002	<0.002
Selenium	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	ND	–	<0.001	<0.001	<0.05	<0.01
Silver	<0.005	<0.01	<0.01	6	<0.01	<0.01	<0.01	ND	ND	<0.006	<0.006	<0.007	<0.005
Sodium	1.3	9	9	0.201	5	21	<1	1.8	3.4	1.71	2.03	1.38	3.9
Strontium	0.04	0.088	0.246	14	0.123	0.123	0.024	0.052	0.047	0.033	0.059	0.035	0.246
Sulfate	<5	9	10	<5	7	16	<5	ND	ND	0.7	1.2	0.4	8.8
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	ND	ND	<0.001	<0.001	<0.001	<0.001
Tin	<0.1	<0.03	<0.05	<0.05	<0.05	<0.03	0.06	ND	ND	<0.05	<0.05	<0.06	<0.01
Titanium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	<0.007	<0.007	<0.007	<0.005
Total Dissolved Solids	<5	50	120	66	72	126	17	35	36	11	25	32	78
Vanadium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ND	ND	<0.005	<0.005	<0.007	<0.005
Zinc	<0.01	0.0	<0.02	<0.02	0.02	0.03	<0.02	ND	0.038	<0.003	<0.003	<0.003	0.005
Acid Base Accounting													
AGP (tons CaCO3/kton)	–	1.3	–	–	–	2.8	–	<0.3	0.31	<0.3	0.3	<0.3	<0.3
ANP (tons CaCO3/kton)	–	164	–	–	–	105	–	130	64	879	533	530	512
NNP (tons CaCO3/kton)		162.7				102.2		130	63.69	679	532.7	530	512
Paste pH (s.u.)	–	–	–	–	–	–	–	–	–	–	–	–	–

Humidity Cell Analytical Results, BIDA-07 / Q1, Sed (1.53 Kg)

Week	Vol. L	Effluent pH	Redox, mV (vs Ag/AgCl)	Conductivity mS/cm	Total Fe mg/l	Total Fe mg/kg	Total Fe Cum. mg/kg	Fe^{2+} mg/l	Fe^{3+} mg/l	$SO_4^{=}$ mg/l	$SO_4^{=}$ mg/kg	$SO_4^{=}$ Cum. mg/kg	Acidity, $CaCO_3$ Equivalents mg/l	Acidity mg/kg	Acidity Cum. mg/kg	Alkalinity, $CaCO_3$ mg/l	Alkalinity mg/kg	Alkalinity Cum. mg/kg
0	0.791	7.19	156	0.13	0.28	0.145	0.145	0.15	0.13	8.5	4.39	4.39	8.0	4.14	4.14	10.00	5.17	5.17
1	0.736	7.51	165	0.14	0.04	0.019	0.164	0.02	0.02	3.5	1.68	6.07	0.0	0.00	4.14	18.00	8.66	13.83
2	0.681	7.55	146	0.13	0.09	0.040	0.204	0.03	0.06	11.0	4.90	10.97	2.0	0.89	5.03	14.00	6.23	20.06
3	0.704	7.58	139	0.14	0.03	0.014	0.218	0.00	0.03	1.7	0.78	11.75	0.0	0.00	5.03	16.00	7.36	27.42
4	0.687	7.55	155	0.14	0.02	0.009	0.227	0.00	0.02	1.7	0.76	12.51	0.0	0.00	5.03	16.00	7.18	34.60
5	0.743	7.68	95	0.14	0.06	0.029	0.256	0.01	0.05	1.6	0.78	13.29	0.0	0.00	5.03	14.00	6.80	41.40
6	0.693	7.61	132	0.14	0.05	0.023	0.279	0.04	0.01	2.1	0.95	14.24	0.0	0.00	5.03	18.00	8.15	49.55
7	0.726	7.84	135	0.14	0.01	0.005	0.284	0.00	0.01	0.8	0.38	14.62	4.0	1.90	6.92	18.00	8.54	58.09
8	0.702	7.53	138	0.14	0.00	0.000	0.284	0.00	0.00	0.7	0.32	14.94	2.0	0.92	7.84	16.00	7.34	65.43
9	0.727	7.67	143	0.14	0.03	0.014	0.298	0.01	0.02	0.7	0.33	15.27	6.0	2.85	10.69	18.00	8.55	73.98
10	0.710	7.91	181	0.14	0.04	0.019	0.317	0.00	0.04	2.1	0.97	16.24	0.0	0.00	10.69	20.00	9.28	83.26
11	0.730	8.71	160	0.14	0.02	0.010	0.327	0.00	0.02	1.1	0.52	16.76	0.0	0.00	10.69	20.00	9.54	92.80
12	0.729	8.71	137	0.14	0.05	0.024	0.351	0.03	0.02	0.8	0.38	17.14	0.0	0.00	10.69	20.00	9.53	102.33
13	0.704	8.38	111	0.14	0.05	0.023	0.374	0.03	0.02	3.8	1.75	18.89	0.0	0.00	10.69	16.00	7.36	109.69
14	0.723	8.39	95	0.14	0.03	0.014	0.388	0.02	0.01	0.5	0.24	19.13	0.0	0.00	10.69	16.00	7.56	117.25
15	0.748	8.34	154	0.14	0.04	0.020	0.408	0.02	0.02	1.4	0.68	19.81	0.0	0.00	10.69	20.00	9.78	127.03
16	0.688	8.07	110	0.13	0.01	0.004	0.412	0.00	0.01	0.5	0.22	20.03	4.0	1.80	12.49	14.00	6.30	133.33
17	0.691	7.87	176	0.12	0.08	0.036	0.448	0.01	0.07	2.1	0.95	20.98	0.0	0.00	12.49	16.00	7.23	140.56
18	0.632	8.15	146	0.13	0.07	0.029	0.477	0.02	0.05	1.2	0.50	21.48	0.0	0.00	12.49	16.00	6.61	147.17
19	0.665	7.76	156	0.13	0.08	0.035	0.512	0.03	0.05	2.3	1.00	22.48	0.0	0.00	12.49	16.00	6.95	154.12
20	0.665	7.82	175	0.12	0.38	0.165	0.677	0.29	0.09	12.3	5.35	27.83	2.0	0.87	13.36	14.00	6.08	160.20
ENDED																		

Profile I Analytical Results, Humidity Cell Extracts, Bald Mountain BIDA-07/Q1, SED

	Extract					
Analysis, mg/L	Week 0	Weeks 1-4	Weeks 5-8	Weeks 9-12	Weeks 13-16	Weeks 17-20
Alkalinity, $CaCO_3$	15.4	17.6	19.3	19.8	17.0	15.3
CO_3, $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
HCO_3	15.4	17.6	19.3	19.8	17.0	15.3
Aluminum	0.12	0.09	0.11	<0.080	<0.080	0.237
Antimony	<0.0030	<0.0030	<0.0030	<0.00300	<0.00300	<0.00300
Arsenic	0.0235	0.0343	0.0341	0.0345	0.0329	0.0285
Barium	0.215	0.196	0.0914	0.0393	0.0346	0.144
Beryllium	<0.0020	<0.0020	<0.0020	<0.00200	<0.00200	<0.00200
Boron	0.386	1.02	1.17	1.12	1.03	0.930
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	3.42	1.5	1.32	1.15	0.915	0.734
Chloride	2.98	0.57	0.30	<0.200	0.320	<0.200
Chromium	<0.006	<0.006	<0.006	<0.0060	<0.0060	<0.0060
Copper	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoride	0.72	0.72	0.710	0.726	0.736	0.704
Iron	<0.06	<0.06	<0.06	<0.06	<0.060	<0.060
Lead	<0.0030	<0.0030	<0.0030	<0.0030	<0.00300	<0.00300
Magnesium	0.28	0.21	0.19	0.171	0.167	0.127
Manganese	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0043
Mercury	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate & Nitrite as N	0.74	0.15	0.056	0.0419	0.0558	0.0717
pH, stu	6.6	7.8	7.11	7.33	6.52	6.23
Potassium	0.69	0.58	0.57	<0.50	<0.50	<0.50
Selenium	<0.0030	<0.0030	<0.0030	<0.0030	<0.00300	<0.00300
Silver	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050
Sodium	11.3	10	8.90	8.26	7.67	9.27
Sulfate	13.2	7.19	2.67	2.20	1.92	4.61
Thallium	<0.00200	<0.00200	<0.00100	<0.00100	<0.00100	<0.00100
Total Dissolved Solids	48	49	29	31	46	51
Zinc	<0.010	<0.010	0.016	<0.010	<0.0100	<0.0100
Cations, meq/L	0.71	0.55	0.50	0.74	0.68	0.48
Anions, meq/L	0.75	0.57	0.50	0.48	0.43	0.47
Balance, %	-2.74	-1.79	0.00	21.19	22.32	1.41
SVL ID #	129595	130179	130776	W700972	W701470	W702043

Humidity Cell Analytical Results, BIDA-Int Q4 (1.832 Kg)

Week	Vol. L	Effluent pH	Redox, mV (vs Ag/AgCl)	Conductivity mS/cm	Total Fe mg/l	Total Fe mg/kg	Total Fe Cum. mg/kg	Fe^{2}+ mg/l	Fe^{3}+ mg/l	SO_4= mg/l	SO_4= mg/kg	SO_4= Cum. mg/kg	Acidity, $CaCO_3$ Equivalents mg/l	Acidity mg/kg	Acidity Cum. mg/kg	Alkalinity, $CaCO_3$ mg/l	Alkalinity mg/kg	Alkalinity Cum. mg/kg
0	0.737	7.57	160	0.12	0.02	0.008	0.008	0.01	0.01	1.5	0.60	0.60	2.0	0.81	0.81	8.00	3.22	3.22
1	0.717	7.24	147	0.13	0.00	0.000	0.008	0.00	0.00	1.3	0.51	1.11	6.0	2.35	3.15	12.00	4.70	7.92
2	0.731	7.95	107	0.14	0.00	0.000	0.008	0.00	0.00	0.9	0.36	1.47	2.0	0.80	3.95	18.00	7.18	15.10
3	0.718	7.97	188	0.14	0.00	0.000	0.008	0.00	0.00	7.7	3.02	4.49	4.0	1.57	5.52	16.00	6.27	21.37
4	0.726	7.67	122	0.14	0.00	0.000	0.008	0.00	0.00	2.2	0.87	5.36	0.0	0.00	5.52	16.00	6.34	27.71
5	0.699	7.57	102	0.14	0.00	0.000	0.008	0.00	0.00	1.3	0.50	5.86	0.0	0.00	5.52	18.00	6.87	34.58
6	0.706	7.38	116	0.13	0.02	0.008	0.016	0.01	0.01	1.5	0.58	6.44	0.0	0.00	5.52	16.00	6.17	40.75
7	0.722	7.37	108	0.13	0.03	0.012	0.028	0.00	0.03	0.5	0.20	6.64	0.0	0.00	5.52	18.00	7.09	47.84
8	0.714	7.58	109	0.13	0.01	0.004	0.032	0.00	0.01	1.0	0.39	7.03	0.0	0.00	5.52	14.00	5.46	53.30
9	0.710	7.43	117	0.13	0.04	0.016	0.048	0.00	0.04	0.2	0.08	7.11	0.0	0.00	5.52	18.00	6.98	60.28
10	0.724	7.84	115	0.13	0.01	0.004	0.052	0.00	0.01	0.6	0.24	7.35	0.0	0.00	5.52	18.00	7.11	67.39
11	0.688	7.96	100	0.13	0.01	0.004	0.056	0.00	0.01	0.5	0.19	7.54	2.0	0.75	6.27	14.00	5.26	72.65
12	0.742	8.18	73	0.13	0.04	0.016	0.072	0.00	0.04	0.4	0.16	7.70	0.0	0.00	6.27	18.00	7.29	79.94
13	0.662	7.78	103	0.13	0.00	0.000	0.072	0.00	0.00	0.5	0.18	7.88	6.0	2.17	8.44	16.00	5.78	85.72
14	0.686	7.70	142	0.13	0.02	0.007	0.079	0.00	0.02	1.1	0.41	8.29	6.0	2.25	10.69	16.00	5.99	91.71
15	0.664	7.87	110	0.13	0.01	0.004	0.083	0.00	0.01	0.3	0.11	8.40	8.0	2.90	13.59	18.00	6.52	98.23
16	0.673	7.90	134	0.13	0.02	0.007	0.090	0.00	0.02	0.5	0.18	8.58	6.0	2.20	15.79	12.00	4.41	102.64
17	0.748	7.66	135	0.13	0.02	0.008	0.098	0.00	0.02	0.6	0.25	8.83	6.0	2.45	18.24	14.00	5.72	108.36
18	0.705	7.93	81	0.13	0.13	0.050	0.148	0.01	0.12	0.4	0.15	8.98	6.0	2.31	20.55	14.00	5.39	113.75
19	0.698	7.70	103	0.13	0.01	0.004	0.152	0.00	0.01	1.1	0.42	9.40	6.0	2.29	22.84	14.00	5.33	119.08
20	0.690	7.86	113	0.13	0.01	0.004	0.156	0.01	0.00	0.0	0.00	9.40	2.0	0.75	23.59	14.00	5.27	124.35
21	0.724	8.09	125	0.13	0.01	0.004	0.160	0.00	0.01	0.0	0.00	9.40	0.0	0.00	23.59	18.00	7.11	131.46
22	0.645	7.87	119	0.13	0.00	0.000	0.160	0.00	0.00	0.2	0.07	9.47	6.0	2.11	25.70	12.00	4.23	135.69

Humidity Cell Analytical Results, SAGA Waste - 6975 (1.794 Kg)

Week	Vol. L	Effluent pH	Redox, mV (vs Ag/AgCl)	Conductivity mS/cm	Total Fe mg/l	Total Fe mg/kg	Total Fe Cum. mg/kg	$Fe^{2}+$ mg/l	$Fe^{3}+$ mg/l	$SO_4=$ mg/l	$SO_4=$ mg/kg	$SO_4=$ Cum. mg/kg	Acidity, $CaCO_3$ Equivalents mg/l	Acidity mg/kg	Acidity Cum. mg/kg	Alkalinity, $CaCO_3$ mg/l	Alkalinity mg/kg	Alkalinity Cum. mg/kg
0	0.679	8.07	90	0.20	0.05	0.019	0.019	0.05	0.00	10.0	3.78	3.78	0.0	0.00	0.00	324.00	122.63	122.63
1	0.676	9.53	141	0.18	0.62	0.234	0.253	0.05	0.57	10.0	3.77	7.55	0.0	0.00	0.00	42.00	15.83	138.46
2	0.703	8.37	118	0.16	0.07	0.027	0.280	0.03	0.04	4.6	1.80	9.35	0.0	0.00	0.00	42.00	16.46	154.92
3	0.691	8.45	145	0.17	0.09	0.035	0.315	0.03	0.06	1.8	0.69	10.04	0.0	0.00	0.00	42.00	16.18	171.10
4	0.678	8.32	114	0.16	0.10	0.038	0.353	0.06	0.04	2.0	0.76	10.80	0.0	0.00	0.00	46.00	17.38	188.48
5	0.681	8.29	154	0.16	0.11	0.042	0.395	0.04	0.07	2.7	1.02	11.82	0.0	0.00	0.00	42.00	15.94	204.42
6	0.590	7.96	179	0.17	0.14	0.046	0.441	0.07	0.07	9.3	3.06	14.88	0.0	0.00	0.00	94.00	30.91	235.33
7	0.669	7.51	159	0.17	0.36	0.134	0.575	0.08	0.28	6.9	2.57	17.45	0.0	0.00	0.00	60.00	22.37	257.70
8	0.689	7.46	151	0.16	3.56	1.367	1.942	0.14	3.42	22.7	8.72	26.17	0.0	0.00	0.00	42.00	16.13	273.83
9	0.699	7.27	144	0.16	0.10	0.039	1.981	0.05	0.05	4.1	1.60	27.77	0.0	0.00	0.00	56.00	21.82	295.65
10	0.718	7.66	163	0.17	0.09	0.036	2.017	0.04	0.05	3.6	1.44	29.21	0.0	0.00	0.00	58.00	23.21	318.86
11	0.749	7.63	152	0.17	0.12	0.050	2.067	0.10	0.02	4.9	2.05	31.26	0.0	0.00	0.00	60.00	25.05	343.91
12	0.706	7.47	131	0.15	0.10	0.039	2.106	0.04	0.06	2.2	0.87	32.13	0.0	0.00	0.00	54.00	21.25	365.16
13	0.659	7.54	146	0.16	0.41	0.151	2.257	0.11	0.30	8.2	3.01	35.14	0.0	0.00	0.00	60.00	22.04	387.20
14	0.684	7.46	160	0.15	0.09	0.034	2.291	0.06	0.03	2.5	0.95	36.09	0.0	0.00	0.00	48.00	18.30	405.50
15	0.706	7.52	138	0.15	0.09	0.035	2.326	0.09	0.00	2.3	0.91	37.00	0.0	0.00	0.00	42.00	16.53	422.03
16	0.661	7.47	158	0.14	0.14	0.052	2.378	0.07	0.07	2.2	0.81	37.81	0.0	0.00	0.00	56.00	20.63	442.66
17	0.702	7.31	153	0.15	0.20	0.078	2.456	0.06	0.14	7.6	2.97	40.78	0.0	0.00	0.00	42.00	16.43	459.09
18	0.663	7.29	148	0.15	0.05	0.018	2.474	0.03	0.02	33.7	12.45	53.23	0.0	0.00	0.00	60.00	22.17	481.26
19	0.702	7.29	144	0.16	0.19	0.074	2.548	0.04	0.15	5.4	2.11	55.34	0.0	0.00	0.00	64.00	25.04	506.30
20	0.613	7.63	178	0.17	0.05	0.017	2.565	0.05	0.00	3.4	1.16	56.50	0.0	0.00	0.00	70.00	23.92	530.22
	ENDED																	

Profile I Analytical Results, Humidity Cell Extracts, Bald Mountain Saga Waste - 6975						
	Extract					
Analysis, mg/L	Week 0	Weeks 1-4	Weeks 5-8	Weeks 9-12	Weeks 13-16	Weeks 17-20
Alkalinity, $CaCO_3$	55.8	38.9	36.8	45.7	42.2	39.3
CO_3, $CaCO_3$	<1.0	8.1	<1.0	<1.0	<1.0	<1.0
HCO_3	55.8	30.8	<1.0	45.7	42.2	39.3
Aluminum	<0.080	0.327	0.951	0.213	0.153	0.126
Antimony	0.0122	0.00929	0.00990	0.00875	0.00678	0.0104
Arsenic	0.0435	0.0429	0.0398	0.0406	0.0298	0.0355
Barium	0.279	0.158	0.165	0.153	0.151	0.145
Beryllium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Boron	0.168	1.07	1.11	1.45	0.997	1.08
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	19.2	6.93	7.17	8.39	6.72	7.29
Chloride	2.84	1.33	0.363	<0.200	<0.200	<0.200
Chromium	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Copper	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoride	1.04	0.843	0.899	0.989	0.714	0.977
Iron	<0.060	0.131	0.164	0.062	0.064	<0.060
Lead	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Magnesium	3.17	1.19	1.30	1.22	1.07	1.21
Manganese	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	0.00066	0.0003	0.00052	0.00022	<0.00020	<0.00020
Nickel	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate & Nitrite as N	6.38	1.52	1.74	1.03	0.444	0.196
pH, stu	7.35	8.72	7.20	7.70	7.85	6.60
Potassium	4.87	2.11	2.24	1.70	1.30	1.39
Selenium	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	11.8	12.1	11.3	11.8	8.08	8.77
Sulfate	11.9	5.47	4.27	2.84	1.84	2.76
Thallium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Total Dissolved Solids	100	78	85	81	96	78
Zinc	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cations, meq/L	1.91	1.36	1.12	1.10	0.83	0.90
Anions, meq/L	1.95	1.08	1.03	1.13	0.97	0.93
Balance, %	-1.18	11.39	4.17	-1.24	-8.01	-2.01
SVL ID #	W701261	W701664	W702190	W702657	W703192	W800335

Humidity Cell Analytical Results,			SWF-SED-OX									(1.53 Kg)					
	Vol.	Effluent	Redox, mV	Conduc tivity	Total Fe			Fe2+	Fe3+	SO4=			Acidity, CaCO3			Alkalinity, CaCO3		
							Cum.					Cum.			Cum.			Cum.
Week	L	pH	(vs Ag/AgCl)	mS/cm	mg/l	mg/kg	mg/kg	mg/l	mg/l	mg/l	mg/kg	mg/kg	mg/l	mg/kg	mg/kg	mg/l	mg/kg	mg/kg
0	0.741	5.45	138	0.15	0.64	0.309	0.309	0.25	0.39	11.0	5.31	5.31	8.0	3.87	3.87	8.00	3.86	3.86
1	0.710	7.04	163	0.13	0.16	0.074	0.383	0.07	0.09	5.5	2.55	7.86	4.0	1.85	5.72	8.00	3.70	7.56
2	0.642	7.04	131	0.15	0.25	0.105	0.488	0.09	0.16	12.5	5.23	13.09	2.0	0.84	6.55	14.00	5.86	13.42
3	0.711	7.11	141	0.15	0.32	0.148	0.636	0.13	0.19	8.5	3.94	17.03	0.0	0.00	6.55	18.00	8.34	21.76
4	0.730	6.89	127	0.14	0.50	0.238	0.874	0.31	0.19	14.1	6.71	23.74	0.0	0.00	6.55	18.00	8.57	30.33
5	0.665	6.84	126	0.15	0.19	0.082	0.956	0.12	0.07	8.3	3.60	27.34	2.0	0.87	7.42	16.00	6.94	37.27
6	0.635	7.23	200	0.15	0.32	0.132	1.088	0.23	0.09	12.8	5.30	32.64	0.0	0.00	7.42	18.00	7.45	44.72
7	0.691	6.97	236	0.14	0.37	0.167	1.255	0.23	0.14	9.5	4.28	36.92	0.0	0.00	7.42	18.00	8.11	52.83
8	0.685	7.43	200	0.14	0.47	0.210	1.465	0.21	0.26	9.2	4.11	41.03	0.0	0.00	7.42	18.00	8.04	60.87
9	0.728	8.02	198	0.13	0.52	0.247	1.712	0.22	0.30	10.0	4.75	45.78	4.0	1.90	9.32	12.00	5.70	66.57
10	0.578	8.51	233	0.13	0.42	0.158	1.870	0.25	0.17	10.4	3.92	49.70	0.0	0.00	9.32	16.00	6.03	72.60
10	0.578	8.51	233	0.13	0.42	0.158	1.87	0.25	0.17	10.4	3.92	49.7	0.0	0.0	9.32	16	6.03	72.6
11	0.724	8.27	223	0.13	0.58	0.274	2.144	0.21	0.37	9.6	4.53	54.23	0.0	0.0	9.32	14	6.61	79.21
12	0.682	7.82	207	0.14	0.15	0.067	2.211	0.11	0.04	5.6	2.49	56.72	0.0	0.0	9.32	12	5.34	84.55
13	0.643	7.31	205	0.14	0.26	0.109	2.32	0.14	0.12	10.2	4.28	61	0.0	0.0	9.32	12	5.03	89.58
14	0.697	7.67	156	0.13	0.27	0.123	2.443	0.16	0.11	8.9	4.04	65.04	0.0	0.0	9.32	14	6.36	95.94
15	0.681	8.23	238	0.13	0.48	0.213	2.656	0.26	0.22	11.1	4.93	69.97	0.0	0.0	9.32	14	6.22	102.2
16	0.727	8.07	203	0.15	0.43	0.204	2.86	0.25	0.18	10.7	5.07	75.04	0.0	0.0	9.32	12	5.69	107.9
17	0.655	8.22	190	0.13	0.27	0.115	2.975	0.12	0.15	9.6	4.1	79.14	0.0	0.0	9.32	12	5.12	113
18	0.646	8.32	196	0.13	0.24	0.101	3.076	0.19	0.05	9.7	4.09	83.23	0.0	0.0	9.32	12	5.05	118
19	0.693	7.99	203	0.14	0.27	0.122	3.198	0.18	0.09	6.7	3.03	86.26	0.0	0.0	9.32	16	7.23	125.3
20	0.696	7.58	210	0.13	0.18	0.082	3.28	0.08	0.1	6.2	2.81	89.07	0.0	0.0	9.32	12	5.45	130.7

END

Profile I Analytical Results, Humidity Cell Extract, Bald Mountain SWF-SED-OX

	Extract Week					
Analysis, mg/L	Week 0	Weeks 1-4	Weeks 5-8	Weeks 9-12	Weeks 13-16	Weeks 17-20
Alkalinity, $CaCO_3$	12	11.0	16.5	12.1	11.8	10.4
CO_3, $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
HCO_3	12	11.0	16.5	12.1	11.8	10.4
Aluminum	6.64	2.49	6.59	0.926	2.4	2.03
Antimony	0.00304	<0.00300	0.00427	<0.00300	<0.00300	<0.00300
Arsenic	0.0378	0.0201	0.0522	0.0194	0.0199	0.0225
Barium	0.346	0.303	0.388	0.189	0.4	0.342
Beryllium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Boron	0.52	0.092	0.112	0.042	0.092	0.086
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	6.21	4.76	5.08	3.97	4.28	4.09
Chloride	2.25	0.998	0.246	<0.200	0.341	0.229
Chromium	0.0102	<0.0060	0.0087	<0.0060	<0.0060	<0.0060
Copper	0.012	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoride	0.613	0.276	0.305	0.224	0.213	0.12
Iron	1.99	0.856	2.63	0.354	0.855	0.717
Lead	<0.00300	<0.00300	0.00334	<0.00300	<0.00300	<0.00300
Magnesium	2.04	1.17	1.81	0.760	0.986	0.917
Manganese	0.0057	0.0055	0.0114	0.0047	0.0041	0.0113
Mercury	0.00032	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel	0.017	<0.010	0.023	<0.010	<0.010	<0.010
Nitrate / Nitrite as N	1.44	0.495	0.0819	<0.0500	<0.0500	<0.0500
pH, stu	6.13	6.60	7.15	7.54	6.32	7.04
Potassium	4.03	1.64	3.14	0.91	1.39	1.35
Selenium	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	19.9	5.59	4.93	1.82	3.92	3.51
Sulfate	45.3	12.0	12.5	6.73	9.92	8.56
Thallium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Total Dissolved Solids	79	120	130	63	100	88
Zinc	0.0581	0.0362	0.0738	0.0160	0.0244	0.0224
Cations, meq/L	2.26	0.93	1.53	0.48	0.81	0.72
Anions, meq/L	1.39	0.55	0.62	0.39	0.47	0.40
Balance, %	23.80	25.80	42.32	9.98	26.74	28.75
SVL Report#	W801779	W802503	W803228	W803881	W804595	W810021

Humidity Cell Analytical Results, SG-1009 50-100 (1.444 Kg)

Week	Vol. L	Effluent pH	Redox, mV (vs Ag/AgCl)	Conductivity mS/cm	Total Fe mg/l	Total Fe mg/kg	Total Fe Cum. mg/kg	Fe^{2+} mg/l	Fe^{3+} mg/l	$SO_4^{=}$ mg/l	$SO_4^{=}$ mg/kg	$SO_4^{=}$ Cum. mg/kg	Acidity, $CaCO_3$ Equivalents mg/l	Acidity mg/kg	Acidity Cum. mg/kg	Alkalinity, $CaCO_3$ Equivalent mg/l	Alkalinity mg/kg	Alkalinity Cum. mg/kg
0	0.758	8.35	183	0.26	0.04	0.021	0.021	0.02	0.02	48.5	25.46	25.46	0.0	0.00	0.00	52.00	27.30	27.30
1	0.741	8.10	202	0.19	0.03	0.015	0.036	0.01	0.02	16.5	8.47	33.93	0.0	0.00	0.00	54.00	27.71	55.01
2	0.814	8.14	208	0.17	0.13	0.073	0.109	0.04	0.09	9.4	5.30	39.23	0.0	0.00	0.00	26.00	14.66	69.67
3	0.696	8.53	210	0.15	0.03	0.014	0.123	0.02	0.01	4.0	1.93	41.16	0.0	0.00	0.00	32.00	15.42	85.09
4	0.742	8.17	229	0.16	0.08	0.041	0.164	0.02	0.06	3.6	1.85	43.01	0.0	0.00	0.00	36.00	18.50	103.59
5	0.750	8.19	232	0.16	0.06	0.031	0.195	0.01	0.05	2.5	1.30	44.31	0.0	0.00	0.00	36.00	18.70	122.29
6	0.755	7.98	245	0.15	0.03	0.016	0.211	0.03	0.00	4.5	2.35	46.66	0.0	0.00	0.00	32.00	16.73	139.02
7	0.781	7.95	224	0.16	0.06	0.032	0.243	0.01	0.05	2.4	1.30	47.96	0.0	0.00	0.00	36.00	19.47	158.49
8	0.678	8.01	270	0.15	0.10	0.047	0.290	0.00	0.10	0.9	0.42	48.38	0.0	0.00	0.00	36.00	16.90	175.39
9	0.726	8.11	261	0.15	0.02	0.010	0.300	0.00	0.02	0.8	0.40	48.78	0.0	0.00	0.00	32.00	16.09	191.48
10	0.683	8.17	293	0.14	0.04	0.019	0.319	0.00	0.04	0.5	0.24	49.02	0.0	0.00	0.00	30.00	14.19	205.67
11	0.740	8.22	233	0.14	0.00	0.000	0.319	0.00	0.00	1.1	0.56	49.58	0.0	0.00	0.00	32.00	16.40	222.07
12	0.651	8.43	229	0.15	0.13	0.059	0.378	0.03	0.10	1.4	0.63	50.21	0.0	0.00	0.00	30.00	13.52	235.59
13	0.723	8.32	219	0.15	0.03	0.015	0.393	0.01	0.02	1.5	0.75	50.96	0.0	0.00	0.00	34.00	17.02	252.61
14	0.722	8.38	212	0.15	0.04	0.020	0.413	0.01	0.03	0.4	0.20	51.16	0.0	0.00	0.00	34.00	17.00	269.61
15	0.732	8.25	237	0.15	0.04	0.020	0.433	0.03	0.01	1.0	0.51	51.67	0.0	0.00	0.00	34.00	17.24	286.85
16	0.811	8.34	225	0.15	0.11	0.062	0.495	0.02	0.09	1.4	0.79	52.46	0.0	0.00	0.00	36.00	20.22	307.07
17	0.628	8.45	208	0.15	0.19	0.083	0.578	0.01	0.18	1.7	0.74	53.20	0.0	0.00	0.00	32.00	13.92	320.99
18	0.703	8.21	201	0.15	0.05	0.024	0.602	0.02	0.03	1.1	0.54	53.74	0.0	0.00	0.00	32.00	15.58	336.57
19	0.689	8.05	192	0.15	0.05	0.024	0.626	0.01	0.04	0.5	0.24	53.98	0.0	0.00	0.00	30.00	14.31	350.88
20	0.734	8.39	189	0.15	0.05	0.025	0.651	0.01	0.04	0.3	0.15	54.13	0.0	0.00	0.00	32.00	16.27	367.15
21	0.666	8.32	181	0.15	0.07	0.032	0.683	0.02	0.05	0.7	0.32	54.45	0.0	0.00	0.00	28.00	12.91	380.06
22	0.798	8.11	182	0.15	0.05	0.028	0.711	0.01	0.04	0.3	0.17	54.62	0.0	0.00	0.00	28.00	15.47	395.53
23	0.683	8.18	176	0.15	0.06	0.028	0.739	0.03	0.03	0.9	0.43	55.05	0.0	0.00	0.00	28.00	13.24	408.77
24	0.711	8.50	191	0.15	0.08	0.039	0.778	0.01	0.07	0.9	0.44	55.49	0.0	0.00	0.00	28.00	13.79	422.56
25	0.716	8.21	177	0.15	0.05	0.025	0.803	0.00	0.05	0.3	0.15	55.64	0.0	0.00	0.00	28.00	13.88	436.44
26	0.747	8.12	186	0.15	0.07	0.036	0.839	0.03	0.04	0.1	0.05	55.69	0.0	0.00	0.00	28.00	14.48	450.92

Profile II Analytical Results, Humidity Cell Extracts,
Bald Mountain ARD Study, SG-1009 50'-100'

	Extract						
Analysis, mg/L	Week 0	Wks 1-4	Wks 5-8	Wks 9-12	Wks 13-16	Wks 17-20	Wks 21-24
Alkalinity, $CaCO_3$	45.9	38.1	31.7	28.6	33.4	28.6	23.5
CO_3, $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
HCO_3	45.9	38.1	31.7	28.6	33.4	28.6	23.5
Aluminum	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Antimony	0.0598	0.0555	0.0444	0.0263	0.0249	0.0176	0.014
Arsenic	0.0948	0.104	0.0953	0.0622	0.066	0.0519	0.0425
Barium	0.183	0.17	0.381	0.502	0.573	0.583	0.593
Beryllium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Bismuth	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Boron	0.057	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	14.3	8.77	11	8.84	10.5	9.5	8.48
Chloride	5.36	0.553	<0.200	0.318	0.26	<0.200	<0.200
Chromium	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Cobalt	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Copper	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoride	1.77	0.268	0.141	0.116	<0.100	<0.100	<0.100
Gallium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Iron	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Lithium	0.02	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium	1.25	0.896	0.69	0.45	0.421	0.323	0.292
Manganese	0.0044	0.0063	0.0118	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	0.00092	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	0.0414	0.0498	0.0189	0.0093	<0.0080	<0.0080	<0.0080
Nickel	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate/Nitrite as N	0.395	<0.0500	<0.0500	<0.0500	<0.0500	0.164	0.704
pH, stu	7.92	7.77	7.69	7.39	7.54	6.94	7.27
Phosphorus	0.095	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium	2.98	0.58	<0.50	<0.50	<0.50	<0.50	<0.50
Scandium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	35.8	7.01	1.16	0.97	<0.50	<0.50	<0.50
Strontium	0.0403	0.039	0.0434	0.0368	0.0366	0.0302	0.0254
Sulfate	59.9	11.8	3.33	3.38	1.96	1.68	1.51
Thallium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Tin	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Dissolved Solids	160	80	70	23	43	44	48
Vanadium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zinc	<0.0100	0.013	0.0122	<0.0100	<0.0100	<0.0100	<0.0100
Cations, meq/L	2.46	0.84	0.67	0.53	0.57	0.51	0.46
Anions, meq/L	2.44	1.04	0.71	0.66	0.72	0.62	0.55
Balance, %	0.43	-10.59	-3.14	-10.61	-11.31	-9.49	-9.28
SVL Report #	W8J0492	W8K0395	W8L0308	W9A0143	W9B0138	W9C0158	W9D0158

Humidity Cell Analytical Results, SG-1043, 40-80 (1.446 Kg)

Week	Vol. L	Effluent pH	Redox, mV (vs Ag/AgCl)	Conductivity mS/cm	Total Fe mg/l	Total Fe mg/kg	Total Fe Cum. mg/kg	Fe^{2+} mg/l	Fe^{3+} mg/l	$SO_4^{=}$ mg/l	$SO_4^{=}$ mg/kg	$SO_4^{=}$ Cum. mg/kg	Acidity, as $CaCO_3$ mg/l	Acidity mg/kg	Acidity Cum. mg/kg	Alkalinity, as $CaCO_3$ mg/l	Alkalinity mg/kg	Alkalinity Cum. mg/kg
0	0.512	7.95	195	0.24	0.08	0.028	0.028	0.04	0.04	33.3	11.79	11.79	0.0	0.00	0.00	60.00	21.24	21.24
1	0.504	7.85	243	0.16	0.03	0.010	0.038	0.02	0.01	6.7	2.34	14.13	0.0	0.00	0.00	24.00	8.37	29.61
2	0.584	7.88	245	0.16	0.06	0.024	0.062	0.02	0.04	8.9	3.59	17.72	0.0	0.00	0.00	26.00	10.50	40.11
3	0.762	8.22	245	0.17	0.02	0.011	0.073	0.02	0.00	6.5	3.43	21.15	0.0	0.00	0.00	30.00	15.81	55.92
4	0.807	8.01	257	0.15	0.12	0.067	0.140	0.01	0.11	4.7	2.62	23.77	0.0	0.00	0.00	20.00	11.16	67.08
5	0.690	8.08	240	0.15	0.03	0.014	0.154	0.03	0.00	4.4	2.10	25.87	0.0	0.00	0.00	22.00	10.50	77.58
6	0.658	7.95	255	0.15	0.00	0.000	0.154	0.00	0.00	0.7	0.32	26.19	0.0	0.00	0.00	18.00	8.19	85.77
7	0.746	7.80	235	0.15	0.04	0.021	0.175	0.00	0.04	4.2	2.17	28.36	0.0	0.00	0.00	22.00	11.35	97.12
8	0.699	7.72	286	0.15	0.05	0.024	0.199	0.02	0.03	2.2	1.06	29.42	0.0	0.00	0.00	24.00	11.60	108.72
9	0.691	7.72	286	0.12	0.05	0.024	0.223	0.02	0.03	1.5	0.72	30.14	0.0	0.00	0.00	16.00	7.65	116.37
10	0.653	7.93	242	0.12	0.02	0.009	0.232	0.01	0.01	1.0	0.45	30.59	0.0	0.00	0.00	12.00	5.42	121.79
11	0.754	7.97	248	0.14	0.03	0.016	0.248	0.01	0.02	2.0	1.04	31.63	0.0	0.00	0.00	16.00	8.34	130.13
12	0.655	7.91	257	0.10	0.07	0.032	0.280	0.02	0.05	1.0	0.45	32.08	0.0	0.00	0.00	6.00	2.72	132.85
13	0.693	7.76	253	0.12	0.01	0.005	0.285	0.01	0.00	0.9	0.43	32.51	0.0	0.00	0.00	8.00	3.83	136.68
14	0.740	7.88	245	0.12	0.04	0.020	0.305	0.02	0.02	1.3	0.67	33.18	0.0	0.00	0.00	12.00	6.14	142.82
15	0.695	7.91	270	0.11	0.01	0.005	0.310	0.00	0.01	1.1	0.53	33.71	0.0	0.00	0.00	10.00	4.81	147.63
16	0.711	8.04	253	0.12	0.04	0.020	0.330	0.04	0.00	1.3	0.64	34.35	0.0	0.00	0.00	12.00	5.90	153.53
17	0.688	8.10	254	0.12	0.04	0.019	0.349	0.01	0.03	3.7	1.76	36.11	0.0	0.00	0.00	12.00	5.71	159.24
18	0.712	7.71	216	0.12	0.06	0.030	0.379	0.03	0.03	1.0	0.49	36.60	0.0	0.00	0.00	8.00	3.94	163.18
19	0.695	7.56	230	0.10	0.04	0.019	0.398	0.01	0.03	0.8	0.38	36.98	0.0	0.00	0.00	6.00	2.88	166.06
20	0.688	7.91	232	0.08	0.05	0.024	0.422	0.01	0.04	2.0	0.95	37.93	0.0	0.00	0.00	4.00	1.90	167.96
21	0.684	8.23	233	0.07	0.03	0.014	0.436	0.02	0.01	1.3	0.61	38.54	0.0	0.00	0.00	4.00	1.89	169.85
22	0.728	8.15	234	0.08	0.03	0.015	0.451	0.00	0.03	0.1	0.05	38.59	0.0	0.00	0.00	4.00	2.01	171.86
23	0.672	7.99	220	0.08	0.08	0.037	0.488	0.04	0.04	1.3	0.60	39.19	0.0	0.00	0.00	4.00	1.86	173.72
24	0.663	8.03	231	0.09	0.20	0.092	0.580	0.09	0.11	4.6	2.11	41.30	0.0	0.00	0.00	8.00	3.67	177.39
25	0.666	8.03	249	0.07	0.07	0.032	0.612	0.03	0.04	1.1	0.51	41.81	0.0	0.00	0.00	6.00	2.76	180.15
26	0.679	8.07	249	0.08	0.00	0.000	0.612	0.00	0.00	6.9	3.24	45.05	0.0	0.00	0.00	4.00	1.88	182.03

**Profile II Analytical Results, Humidity Cell Extracts,
Bald Mountain ARD Study, SG-1043 40'-80'**

	Extract						
Analysis, mg/L	Week 0	Wks 1-4	Wks 5-8	Wks 9-12	Wks 13-16	Wks 17-20	Wks 21-24
Alkalinity, $CaCO_3$	45.3	27.4	19.7	12.2	11.6	6.8	4
CO_3, $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
HCO_3	45.3	27.4	19.7	<1.0	<1.0	6.8	4
Aluminum	0.168	<0.080	0.194	0.294	<0.080	<0.080	0.496
Antimony	0.0083	0.00311	0.00368	<0.00300	<0.00300	<0.00300	0.00412
Arsenic	0.0227	0.0139	0.00979	0.00787	0.00652	0.00537	0.0109
Barium	0.277	0.301	0.372	0.291	0.229	0.249	0.26
Beryllium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Bismuth	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Boron	0.162	<0.040	<0.040	<0.040	<0.040	<0.040	0.041
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	15.2	6.53	6.12	3.21	3.01	2.05	1.31
Chloride	9.34	2.5	1.38	0.212	0.552	0.244	<0.200
Chromium	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Cobalt	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Copper	<0.010	<0.010	0.017	<0.010	0.017	<0.010	<0.010
Fluoride	1.27	0.466	0.358	0.196	0.112	0.103	<0.100
Gallium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Iron	<0.060	<0.060	0.064	0.092	<0.060	<0.060	0.389
Lead	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Lithium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium	2.29	0.951	0.842	0.441	0.417	0.257	0.186
Manganese	0.024	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	0.0276	0.0178	0.013	<0.0080	<0.0080	<0.0080	<0.0080
Nickel	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate/Nitrite as N	0.782	<0.0500	0.0659	<0.0500	0.0623	0.146	0.226
pH, stu	7.79	7.36	7.35	7.07	6.96	6.38	6.59
Phosphorus	0.865	0.139	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium	7.18	3.03	2.5	1.09	1.09	0.89	<0.50
Scandium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	22.3	5.81	3.68	2.05	1.22	0.65	1.53
Strontium	0.0804	0.0429	0.0387	0.0226	0.0192	0.0135	0.0164
Sulfate	38.5	10.5	5.75	3.96	2.32	1.7	2.7
Thallium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Tin	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium	<0.0050	<0.0050	0.0066	0.0064	<0.0050	<0.0050	0.006
Total Dissolved Solids	140	79	67	<10	24	19	48
Vanadium	0.0073	0.0055	<0.0050	<0.0050	<0.0050	<0.0050	0.0054
Zinc	0.0218	<0.0100	<0.0100	<0.0100	0.0122	<0.0100	<0.0100
Cations, meq/L	2.13	0.74	0.63	0.35	0.27	0.18	0.22
Anions, meq/L	2.10	0.86	0.58	0.34	0.31	0.19	0.16
Balance, %	0.75	-7.38	4.50	1.73	-5.95	-3.74	17.48
SVL Report #	W8J0492	W8K0395	W8L0308	W9A0143	W9B0138	W9C0158	W9D0158

Humidity Cell Analytical Results, SG-1054 195'-220' (1.500 Kg)

Week	Vol. L	Effluent pH	Redox, mV (vs Ag/AgCl)	Conductivity mS/cm	Total Fe mg/l	Total Fe mg/kg	Total Fe Cum. mg/kg	Fe^{2+} mg/l	Fe^{3+} mg/l	$SO_4^{=}$ mg/l	$SO_4^{=}$ mg/kg	$SO_4^{=}$ Cum. mg/kg	Acidity, as $CaCO_3$ mg/l	Acidity mg/kg	Acidity Cum. mg/kg	Alkalinity, as $CaCO_3$ mg/l	Alkalinity mg/kg	Alkalinity Cum. mg/kg
0	0.789	7.68	207	0.21	0.01	0.005	0.005	0.00	0.01	80.4	42.29	42.29	0.0	0.00	0.00	18.00	9.47	9.47
1	0.675	8.08	197	0.27	0.01	0.005	0.010	0.00	0.01	80.4	36.18	78.47	0.0	0.00	0.00	26.00	11.70	21.17
2	0.634	8.03	177	0.22	0.03	0.013	0.023	0.00	0.03	44.5	18.81	97.28	0.0	0.00	0.00	38.00	16.06	37.23
3	0.728	7.97	216	0.17	0.04	0.019	0.042	0.02	0.02	12.0	5.82	103.10	0.0	0.00	0.00	26.00	12.62	49.85
4	0.726	7.92	227	0.17	0.07	0.034	0.076	0.04	0.03	7.9	3.82	106.92	0.0	0.00	0.00	28.00	13.55	63.40
5	0.782	7.90	231	0.15	0.04	0.021	0.097	0.03	0.01	4.1	2.14	109.06	0.0	0.00	0.00	26.00	13.55	76.95
6	0.755	7.69	252	0.16	0.11	0.055	0.152	0.02	0.09	6.9	3.47	112.53	0.0	0.00	0.00	26.00	13.09	90.04
7	0.736	7.60	250	0.16	0.06	0.029	0.181	0.04	0.02	5.5	2.70	115.23	0.0	0.00	0.00	24.00	11.78	101.82
8	0.717	7.52	251	0.14	0.00	0.000	0.181	0.00	0.00	5.0	2.39	117.62	0.0	0.00	0.00	18.00	8.60	110.42
9	0.734	7.38	251	0.17	0.04	0.020	0.201	0.03	0.01	5.1	2.50	120.12	0.0	0.00	0.00	24.00	11.74	122.16
10	0.755	7.28	285	0.16	0.08	0.040	0.241	0.03	0.05	5.2	2.62	122.74	0.0	0.00	0.00	22.00	11.07	133.23
11	0.725	7.61	271	0.15	0.03	0.015	0.256	0.02	0.01	3.5	1.69	124.43	0.0	0.00	0.00	20.00	9.67	142.90
12	0.712	8.13	216	0.14	0.05	0.024	0.280	0.03	0.02	3.6	1.71	126.14	0.0	0.00	0.00	22.00	10.44	153.34
13	0.750	7.76	218	0.15	0.06	0.030	0.310	0.03	0.03	5.0	2.50	128.64	0.0	0.00	0.00	26.00	13.00	166.34
14	0.726	8.06	222	0.15	0.06	0.029	0.339	0.03	0.03	8.4	4.07	132.71	0.0	0.00	0.00	22.00	10.65	176.99
15	0.694	7.96	235	0.16	0.07	0.032	0.371	0.04	0.03	4.4	2.04	134.75	0.0	0.00	0.00	22.00	10.18	187.17
16	0.757	8.02	227	0.14	0.07	0.035	0.406	0.03	0.04	3.9	1.97	136.72	0.0	0.00	0.00	14.00	7.07	194.24
17	0.738	8.04	270	0.15	0.05	0.025	0.431	0.04	0.01	3.7	1.82	138.54	0.0	0.00	0.00	18.00	8.86	203.10
18	0.770	8.05	263	0.15	0.08	0.041	0.472	0.04	0.04	4.4	2.26	140.80	0.0	0.00	0.00	18.00	9.24	212.34
19	0.722	7.74	226	0.16	0.05	0.024	0.496	0.03	0.02	3.0	1.44	142.24	0.0	0.00	0.00	16.00	7.70	220.04
20	0.723	7.91	225	0.15	0.05	0.024	0.520	0.04	0.01	3.8	1.83	144.07	0.0	0.00	0.00	16.00	7.71	227.75
21	0.767	7.69	228	0.16	0.05	0.026	0.546	0.02	0.03	4.0	2.05	146.12	0.0	0.00	0.00	22.00	11.25	239.00
22	0.728	7.51	221	0.14	0.08	0.039	0.585	0.05	0.03	6.5	3.15	149.27	0.0	0.00	0.00	16.00	7.77	246.77
23	0.734	7.74	219	0.13	0.05	0.024	0.609	0.05	0.00	4.4	2.15	151.42	0.0	0.00	0.00	16.00	7.83	254.60
24	0.736	7.93	217	0.13	0.09	0.044	0.653	0.06	0.03	3.1	1.52	152.94	0.0	0.00	0.00	12.00	5.89	260.49
25	0.732	8.19	206	0.13	0.07	0.034	0.687	0.04	0.03	2.9	1.42	154.36	0.0	0.00	0.00	16.00	7.81	268.30
26	0.738	8.19	216	0.13	0.08	0.039	0.726	0.05	0.03	5.3	2.61	156.97	0.0	0.00	0.00	12.00	5.90	274.20
27	0.712	8.18	218	0.13	0.07	0.033	0.759	0.05	0.02	3.0	1.42	158.39	0.0	0.00	0.00	12.00	5.70	279.90
28	0.751	7.92	229	0.13	0.07	0.035	0.794	0.00	0.07	2.7	1.35	159.74	0.0	0.00	0.00	10.00	5.01	284.91

Profile II Analytical Results, Humidity Cell Extracts,
Bald Mountain ARD Study, SG-1054 195'-220'

	Extract						
Analysis, mg/L	Week 0	Wks 1-4	Wks 5-8	Wks 9-12	Wks 13-16	Wks 17-20	Wks 21-24
Alkalinity, $CaCO_3$	11.9	28.7	18	40.5	18.9	14.7	12.7
CO_3, $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
HCO_3	11.9	28.7	18	40.5	18.9	14.7	12.7
Aluminum	<0.080	<0.080	0.126	0.086	<0.080	<0.080	0.09
Antimony	0.00357	0.00714	0.00487	0.00345	0.0045	0.00446	0.00401
Arsenic	<0.00300	0.0107	0.00544	0.00363	0.00317	0.00426	0.00322
Barium	0.236	0.158	0.264	0.184	0.304	0.327	0.35
Beryllium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Bismuth	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Boron	0.097	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	19.6	18.4	7.94	10.4	7.46	6.47	5.9
Chloride	7.07	2.11	<0.200	0.295	0.262	<0.200	<0.200
Chromium	0.0124	0.0065	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Cobalt	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Copper	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoride	0.485	0.592	0.251	0.272	0.365	0.53	0.229
Gallium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Iron	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Lithium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium	2.44	2.22	0.912	6.04	0.826	0.685	0.598
Manganese	0.0055	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	<0.00026	<0.00040	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	0.0115	0.0203	0.0101	0.0243	0.0083	<0.0080	<0.0080
Nickel	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate/Nitrite as N	0.674	0.133	<0.0500	0.106	<0.100	<0.0500	<0.0500
pH, stu	7.37	8.02	6.98	7.79	7.22	6.88	6.43
Phosphorus	0.062	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium	6.49	7.68	3.08	2.68	2.23	1.82	1.43
Scandium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	10.3	3.97	<0.50	<0.50	<0.50	0.55	<0.50
Strontium	0.0688	0.0556	0.0409	0.0516	0.0386	0.039	0.0374
Sulfate	66.7	44.1	8.46	19.7	6.85	7.51	5.52
Thallium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Tin	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Dissolved Solids	130	100	56	95	32	59	22
Vanadium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zinc	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cations, meq/L	1.80	1.48	0.57	1.10	0.51	0.46	0.40
Anions, meq/L	1.90	1.59	0.55	1.25	0.55	0.48	0.38
Balance, %	-2.69	-3.74	1.93	-6.38	-3.99	-2.24	2.00
SVL Report #	W8J0199	W8K0025	W8L0017	W8L0487	W9A0389	W9B0365	W9C0450

Humidity Cell Analytical Results, SG-1054 355'-380' (1.520 Kg)

		Effluent	Redox,	Conductivity	Total Fe					SO_4=			Acidity, as $CaCO_3$			Alkalinity, as $CaCO_3$		
Week	Vol. L	pH	mV (vs Ag/AgCl)	mS/cm	mg/l	mg/kg	Cum. mg/kg	Fe^{2}+ mg/l	Fe^{3}+ mg/l	mg/l	mg/kg	Cum. mg/kg	mg/l	mg/kg	Cum. mg/kg	mg/l	mg/kg	Cum. mg/kg
0	0.647	7.43	183	0.30	0.01	0.004	0.004	0.01	0.00	22.4	9.53	9.53	0.0	0.00	0.00	14.00	5.96	5.96
1	0.630	7.59	203	0.18	0.01	0.004	0.008	0.01	0.00	22.4	9.28	18.81	0.0	0.00	0.00	18.00	7.46	13.42
2	0.482	7.56	251	0.15	0.02	0.006	0.014	0.01	0.01	10.1	3.20	22.01	0.0	0.00	0.00	14.00	4.44	17.86
3	0.511	7.45	248	0.16	0.07	0.024	0.038	0.00	0.07	10.6	3.56	25.57	0.0	0.00	0.00	22.00	7.40	25.26
4	0.646	7.35	295	0.08	0.01	0.004	0.042	0.00	0.01	0.4	0.17	25.74	0.0	0.00	0.00	14.00	5.95	31.21
5	0.879	7.14	290	0.10	0.00	0.000	0.042	0.00	0.00	0.1	0.06	25.80	2.0	1.16	1.16	6.00	3.47	34.68
6	0.788	7.03	288	0.09	0.02	0.010	0.052	0.00	0.02	0.1	0.03	25.83	0.0	0.00	1.16	4.00	2.07	36.75
7	0.721	6.77	295	0.09	0.00	0.000	0.052	0.00	0.00	0.1	0.05	25.88	0.0	0.00	1.16	4.00	1.90	38.65
8	0.734	6.23	296	0.08	0.00	0.000	0.052	0.00	0.00	2.7	1.30	27.18	2.0	0.97	2.12	2.00	0.97	39.62
9	0.730	5.98	325	0.07	0.03	0.014	0.066	0.01	0.02	0.1	0.04	27.22	4.0	1.92	4.04	2.00	0.96	40.58
10	0.719	5.77	331	0.06	0.02	0.009	0.075	0.00	0.02	0.0	0.00	27.22	4.0	1.89	5.94	2.00	0.95	41.53
11	0.718	5.54	340	0.06	0.07	0.033	0.108	0.00	0.07	0.5	0.24	27.46	2.0	0.95	6.88	2.00	0.94	42.47
12	0.703	5.70	268	0.05	0.00	0.000	0.108	0.00	0.00	0.2	0.09	27.55	0.0	0.00	6.88	2.00	0.93	43.40
13	0.706	5.83	293	0.05	0.00	0.000	0.108	0.00	0.00	1.0	0.46	28.01	2.0	0.93	7.81	2.00	0.93	44.33
14	0.686	6.04	283	0.07	0.01	0.005	0.113	0.00	0.01	0.4	0.18	28.19	0.0	0.00	7.81	2.00	0.90	45.23
15	0.691	5.87	289	0.06	0.01	0.005	0.118	0.00	0.01	0.5	0.23	28.42	0.0	0.00	7.81	2.00	0.91	46.14
16	0.701	5.84	256	0.06	0.01	0.005	0.123	0.00	0.01	0.5	0.23	28.65	2.0	0.92	8.73	2.00	0.92	47.06
17	0.693	5.97	306	0.06	0.02	0.009	0.132	0.00	0.02	0.6	0.27	28.92	2.0	0.91	9.64	2.00	0.91	47.97
18	0.704	6.06	306	0.06	0.02	0.009	0.141	0.02	0.00	0.5	0.23	29.15	2.0	0.93	10.57	2.00	0.93	48.90
19	0.684	5.67	303	0.11	0.07	0.032	0.173	0.00	0.07	0.0	0.00	29.15	4.0	1.80	12.37	2.00	0.90	49.80
20	0.693	5.73	254	0.06	0.01	0.005	0.178	0.00	0.01	0.0	0.00	29.15	2.0	0.91	13.28	2.00	0.91	50.71
21	0.694	6.01	260	0.06	0.01	0.005	0.183	0.00	0.01	0.9	0.41	29.56	0.0	0.00	13.28	2.00	0.91	51.62
22	0.683	6.39	254	0.06	0.01	0.004	0.187	0.00	0.01	0.7	0.31	29.87	0.0	0.00	13.28	2.00	0.90	52.52
23	0.693	6.33	275	0.10	0.00	0.000	0.187	0.00	0.00	0.7	0.32	30.19	0.0	0.00	13.28	2.00	0.91	53.43
24	0.722	6.61	241	0.06	0.01	0.005	0.192	0.00	0.01	0.6	0.29	30.48	0.0	0.00	13.28	2.00	0.95	54.38
25	0.685	6.74	249	0.07	0.02	0.009	0.201	0.00	0.02	0.7	0.32	30.80	2.0	0.90	14.18	1.00	0.45	54.83
26	0.641	7.15	236	0.10	0.02	0.008	0.209	0.01	0.01	1.6	0.67	31.47	2.0	0.84	15.03	2.00	0.84	55.67
27	0.684	7.39	223	0.08	0.00	0.000	0.209	0.00	0.00	0.1	0.03	31.50	2.0	0.90	15.93	2.00	0.90	56.57
28	0.688	7.37	242	0.07	0.00	0.000	0.209	0.00	0.00	0.0	0.00	31.50	2.0	0.91	16.83	0.00	0.00	56.57

Profile II Analytical Results, Humidity Cell Extracts,
Bald Mountain ARD Study, SG-1054 355'-380'

	Extract						
Analysis, mg/L	Week 0	Wks 1-4	Wks 5-8	Wks 9-12	Wks 13-16	Wks 17-20	Wks 21-24
Alkalinity, $CaCO_3$	19.6	10.6	1.7	<1.0	<1.0	<1.0	<1.0
CO_3, $CaCO_3$	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
HCO_3	19.6	10.6	1.7	<1.0	<1.0	<1.0	<1.0
Aluminum	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Antimony	0.00397	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Arsenic	0.0103	0.0156	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Barium	0.106	0.0818	0.0869	0.0556	0.028	0.0376	0.0358
Beryllium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Bismuth	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Boron	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Cadmium	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium	33.5	5.89	1.52	0.481	0.477	0.48	0.594
Chloride	15	1.83	0.304	<0.200	0.221	0.219	<0.200
Chromium	0.0336	0.0062	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Cobalt	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Copper	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoride	0.45	0.409	0.289	<0.100	<0.100	0.155	<0.100
Gallium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Iron	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Lead	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Lithium	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Magnesium	3.89	0.571	0.16	0.064	<0.060	<0.060	<0.060
Manganese	0.0121	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Mercury	<0.00022	<0.00040	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	0.0105	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Nickel	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate/Nitrite as N	3.02	0.153	0.451	0.333	0.176	0.118	0.0804
pH, stu	7.18	7.02	5.97	5.74	5.71	5.93	5.93
Phosphorus	0.084	0.201	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium	10.5	3.97	0.67	<0.50	<0.50	<0.50	<0.50
Scandium	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Selenium	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Silver	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium	18.5	2.44	<0.50	<0.50	<0.50	<0.50	<0.50
Strontium	0.115	0.0299	0.0099	<0.0050	<0.0050	<0.0050	<0.0050
Sulfate	104	14.5	2.14	0.48	0.58	0.72	0.79
Thallium	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Tin	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Dissolved Solids	180	36	54	32	12	<10	<10
Vanadium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zinc	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cations, meq/L	3.07	0.55	0.11	0.03	0.03	0.03	0.03
Anions, meq/L	3.22	0.60	0.13	0.04	0.04	0.04	0.03
Balance, %	-2.30	-3.81	-8.87	-11.83	-14.90	-14.77	5.10
SVL Report #	W8J0199	W8K0025	W8L0017	W8L0487	W9A0389	W9B0365	W9C0450

APPENDIX F

Wildlife Species List

Nevada Division of Wildlife (Eastern Region)
Wildlife Species List - South Ruby Allotment (Unit 104)

Birds

Order: Podicipediformes
Family: Podicipedidae (Grebes)
Pied-billed Grebe	*Podilymbus podiceps*

Order: Ciconiiformes
Family: Ardeidae (Bitterns, Herons, Egrets)
Great Blue Heron	*Ardea herodias*

Family: Threskiornithidae (Ibises)
White-faced Ibis	*Plegadis chihi*

Family: Cathartidae (New World Vultures)
Turkey Vulture	*Cathartes aura*

Order: Anseriformes
Family: Anatidae (Ducks, Geese, Swans)
Greater White-fronted Goose	*Anser albifrons*
Snow Goose	*Chen caerulescens*
Canada Goose	*Branta canadensis*
Trumpeter Swan	*Cygnus buccinator*
Tundra Swan	*Cygnus columbianus*
Wood Duck	*Aix sponsa*
Gadwall	*Anus strepera*
American Widgeon	*Anus americana*
Mallard	*Anus platyrhynchos*
Cinnamon Teal	*Anus cyanoptera*
Blue-winged Teal	*Anus discors*
Northern Shoveler	*Anus clypeata*
Northern Pintail	*Anus acuta*
Green-winged Teal	*Anus crecca*
Canvasback	*Aythya valisinaria*
Redhead	*Aythya americana*
Ring-necked Duck	*Aythya collaris*
Lesser Scaup	*Aythya affinis*
Bufflehead	*Bucephala albeola*
Common Goldeneye	*Bucephala clangula*
Barrow's Goldeneye	*Bucephala islandica*
Hooded Merganser	*Lophodytes cucullatus*
Common Merganser	*Mergus merganser*
Red-breasted Merganser	*Mergus serrator*
Ruddy Duck	*Oxyura jamaicensis*

Order: Falconiformes
Family: Accipitridae (Hawks, Eagles, Osprey)
Bald Eagle	*Haliaetus leucocephalus*
Northern Harrier	*Circus cyaneus*
Swainson's Hawk	*Buteo swainsoni*
Red-tailed Hawk	*Buteo jamaicensis*
Ferruginous Hawk	*Buteo regalis*
Rough-legged Hawk	*Buteo lagopus*
Golden Eagle	*Aquila chrysaetos*

Family: Falconidae (Falcons)
American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
American Peregrine Falcon	*Falco perigrinus*
Prairie Falcon	*Falco mexicanus*

Order: Galliformes
Family: Phasianidae (Grouse, Partridge)
Chukar	*Alectoris chukar*
Gray Partridge	*Perdix perdix*
Sage Grouse	*Centrocercus urophasianus*

Order: Gruiformes
Family: Rallidae (Rails, Coots)
Sora	*Porzana carolina*
American Coot	*Fulica americana*

Family: Gruidae (Cranes)
Greater Sandhill Crane	*Grus canadansis tabida*

Order: Charadriiformes
Family: Charadriidae (Plovers)
Snowy Plover	*Charadrius alexandrinus*
Killdeer	*Charadrius vociferus*

Family: Recurvirostridae (Avocets)
Black-necked Stilt	*Himantopus mexicanus*
American Avocet	*Recurvirostra americana*

Family: Scolopacidae (Sandpipers, Phalaropes)
Greater Yellowlegs	*Tringa melanoleuca*
Lesser Yellowlegs	*Tringa flavipes*
Willet	*Catoptrophorus semipalmatus*
Long-billed Curlew	*Numenius americanus*
Western Sandpiper	*Calidris mauri*
Least Sandpiper	*Calidris minutilla*
Common Snipe	*Gallinago gallinago*

Family: Laridae (Gulls, Terns)
Franklin's Gull	*Larus pipixcan*
Ring-billed Gull	*Larus delawarensis*
California Gull	*Larus californicus*
Caspian Tern	*Sterna caspia*
Forster's Tern	*Sterna forsteri*

Order: Columbiformes
Family: Columbidae (Doves)
Rock Dove	*Columba livia*
Mourning Dove	*Zenaida macroura*

Order: Strigiformes

Family: Tytonidae (Barn Owls)

Barn Owl	*Tyto alba*

Family: Strigidae (Owls)

Western Screech-Owl	*Otus kennicottii*
Great Horned Owl	*Bubo virginianus*
Burrowing Owl	*Athene cunicularia*
Short-eared Owl	*Asio flammeus*
Northern Saw-whet Owl	*Aegolius acadicus*

Order: Caprimulgiformes

Family: Caprimulgidae (Goatsuckers)

Common Nighthawk	*Chordeiles minor*
Common Poorwill	*Phalaenoptilus nuttallii*

Order: Apodiformes

Family: Trochilidae (Hummingbirds)

Black-chinned Hummingbird	*Archilochus alexandri*
Calliope Hummingbird	*Stellula calliope*
Broad-tailed Hummingbird	*Selasphorus platycercus*
Rufous Hummingbird	*Selasphorus rufus*

Order: Piciformes

Family: Picidae (Woodpeckers)

Red-naped Sapsucker	*Sphyrapicus nuchalis*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Northern Flicker	*Colaptes auratus*

Order: Passeriformes

Family: Tyrannidae (Flycatchers)

Western Wood-Pewee	*Contopus sordidulus*
Willow Flycatcher	*Epidonax traillii*
Gray Flycatcher	*Epidonax wrightii*
Say's Phoebe	*Sayornis saya*
Ash-throated Flycatcher	*Myiarchus cinerascens*
Western Kingbird	*Tyrannus verticalis*

Family: Laniidae (Shrikes)

Loggerhead Shrike	*Lanius ludovicianus*
Northern Shrike	*Lanius excubitor*

Family: Corvidae (Jays)

Western Scrub-Jay	*Aphelocoma californica*
Pinyon Jay	*Gymnorhinus cyanocephalus*
Black-billed Magpie	*Pica pica*
American Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*

Family: Aluididae (Larks)

Horned Lark	*Eremophila alpestris*

Family: Hirundinidae (Swallows)

Tree Swallow	*Tachycineta bicolor*
Violet-green Swallow	*Tachycineta thalassina*
N. Rough-winged Swallow	*Stelgidopteryx serripennis*
Barn Swallow	*Hirundo rustica*

Family: Paridae (Chickadees, Titmice)

Mountain Chickadee	*Poecile gambeli*
Juniper Titmouse	*Baeolophus griseus*

Family: Aegithalidae (Bushtit)

Bushtit	*Psaltriparus minimus*

Family: Troglodytidae (Wrens)

Rock Wren	*Salpinctes obsoletus*
Canyon Wren	*Catherpes mexicanus*
Marsh Wren	*Cistothorus palustris*

Family: Regulidae (Kinglets)

Golden-crowned Kinglet	*Regulus satrapa*
Ruby-crowned Kinglet	*Redulus calendula*

Family: Sylviidae (Gnatcatchers)

Blue-gray Gnatcatcher	*Polioptila caerulea*

Family: Turnidae (Thrushes)

Mountain Bluebird	*Sialia currucoides*
Townsend's Solitaire	*Myadestes townsendi*
American Robin	*Turdus migratorius*

Family: Mimidae (Thrashers, Mockingbirds)

Northern Mockingbird	*Mimus polyglottos*
Sage Thrasher	*Oreoscoptes montanus*

Family: Sturnidae (Starlings)

European Starling	*Sturnus vulgaris*

Family: Motacillidae (Pipits)

American Pipit	*Anthus rubescens*

Family: Parulidae (Warblers)

Yellow Warbler	*Dendroica petechia*
Yellow-rumped Warbler	*Dendroica coronata*
Black-throated Gray Warbler	*Dendroica nigrescens*
Common Yellowthroat	*Geothlypis trichas*

Family: Emberizidae (Sparrows,Towhees,Juncos)

Green-tailed Towhee	*Pipilo chlorurus*
Spotted Towhee	*Pipilo maculatus*
American Tree Sparrow	*Spizella arborea*
Chipping Sparrow	*Spizella passerina*
Brewer's Sparrow	*Spizella breweri*
Vesper Sparrow	*Pooecetes gramineus*

Family: Emberizidae (Sparrows,Towhees,Juncos) (continued)

Lark Sparrow	*Chondestes grammacus*
Black-throated Sparrow	*Amphispiza bileneata*
Sage Sparrow	*Amphispiza belli*
Savannah Sparrow	*Passerculus sandwichensis*
Fox Sparrow	*Passerella iliaca schistacea*
Song Sparrow	*Melospiza melodia*
Lincoln's Sparrow	*Melospiza lincolnii*
White-crowned Sparrow	*Zonotrichia leucophrys*

Dark-eyed Junco *(Oregon)*	*Junco hyemalis therburi*
Dark-eyed Junco *(Gray-headed)*	*Junco hyemalis caniceps*

Family: Cardinalidae (Grosbeaks, Buntings)

Black-headed Grosbeak	*Pheucticus melanocephalus*
Lazuli Bunting	*Passerina amoena*

Family: Icteridae (Blackbirds, Orioles)

Red-winged Blackbird	*Agelaius phoeniceus*
Western Meadowlark	*Sturnella neglecta*
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*
Brewer's Blackbird	*Euphagus cyanocephalus*
Great-tailed Grackle	*Quiscalus mexicanus*
Brown-headed Cowbird	*Molothrus ater*
Bullock's Oriole	*Icterus bullockii*
Scott's Oriole	*Icterus parisorum*

Family: Fringillidae (Finches, Grosbeaks)

Gray-crowned Rosy Finch	*Leucosticte tephrocotis*
Black Rosy Finch	*Leucosticte atrata*
Cassin's Finch	*Carpodacus cassinii*
House Finch	*Carpodacus mexicanus*

Family: Passeridae (Old World Sparrows)

House Sparrow	*Passer domesticus*

Mammals

Order: Insectivora (Insect-Eaters)

Family: Soricidae (Shrews)

Merriam's Shrew	*Sorex meriammi*
Dusky Shrew	*Sorex monticolus*
Vagrant Shrew	*Sorex vagrans*
Water Shrew	*Sorex palustris*
Preble's Shrew	*Sorex preblei*

Order: Chiroptera (Bats)

Family: Vespertilionidae (Plainnose Bats)

California Myotis	*Myotis californicus*
Small-footed Myotis	*Myotis ciliolabrum*
Long-eared Myotis	*Myotis evotis*
Little Brown Bat	*Myotis lucifugus*
Long-legged Myotis	*Myotis volans*
Hoary Bat	*Lasiurus cinereus*
Silver-haired Bat	*Lasionycteris noctivagans*
Western Pipistrelle	*Pipistrellus hesperus*
Big Brown Bat	*Eptesicus fuscus*
Townsend's Big-eared Bat	*Corynorhinus townsendii*
Spotted Bat	*Euderma maculata*
Pallid Bat	*Antrozous pallidus*

Family: Molossidae (Freetail Bats)

Brazilian Free-tailed Bat	*Tadarida brasiliensis*

Order: Lagomorpha (Hares, Pikas, Rabbits)

Family: Leporidae (Hares, Rabbits)

Pygmy Rabbit	*Brachylagus idahoensis*
Mountain Cottontail	*Sylvilagus nuttalli*
Black-tailed Jackrabbit	*Lepus californicus*

Order: Rodentia (Rodents)

Family: Sciuridae (Squirrels)

Least Chipmunk	*Tamias minimus*
Cliff Chipmunk	*Tamias dorsalis*
Whitetail Antelope Squirrel	*Ammospermophilus leucurus*
Townsend Ground Squirrel	*Spermophilus townsendii*
Belding Ground Squirrel	*Spermophilus beldingi*
Rock Squirrel	*Spermophilus variegatus*

Family: Geomyidae (Gophers)

Botta's Pocket Gopher	*Thomomys bottae*
Northern Pocket Gopher	*Thomomys talpoides*
Southern Pocket Gopher	*Thomomys umbrinus*

Family: Heteromyidae (Kangaroo Rodents)

Little Pocket Mouse	*Perognathus longimembris*
Great Basin Pocket Mouse	*Perognathus parvus*
Dark Kangaroo Mouse	*Microdipodops megacephalus*
Ord Kangaroo Rat	*Dipodomys ordii*
Chisel-toothed Kangaroo Rat	*Dipodomys microps*

Family: Cricetidae (Mice, Rats, Voles)

Western Harvest Mouse	*Reithrodontomys megalotis*
Canyon Mouse	*Peromyscus crinitus*
Deer Mouse	*Peromyscus maniculatus*
Pinion Mouse	*Peromyscus truei*
Northern Grasshopper Mouse	*Onychomys leucogaster*
Desert Woodrat	*Neotoma lepida*
Mountain Vole	*Microtus montanus*
Long-tailed Vole	*Microtus longicaudus*
Sagebrush Vole	*Lemmiscus curtatus*
Muskrat	*Ondatra zibethica*

Family: Zapodidae (Jumping Mice)

Western Jumping Mouse	*Zapus princeps*

Family: Erethizontidae (New World Porcupines)

Porcupine	*Erethizon dorsatum*

Order: Carnivora (Flesh-Eaters)

Family: Canidae (Dogs, Wolves, Foxes)

Coyote	*Canis latrans*
Gray Wolf	*Canis lupus (locally extirpated)*
RedFox	*Vulpes vulva*
Kit Fox	*Vulpes macrotis*

Family: Procyonidae (Racoons and Their Kin)

Raccoon	*Procyon lotor*

Family: Mustelidae (Weasels and Their Kin)

Short-tailed Weasel	*Mustela erminae*
Long-tailed Weasel	*Mustela frenata*

Badger *Taxidea taxus*
Striped Skunk *Mephitis mephitis*
Spotted Skunk *Spilogale putorius*

Family: Felidae (Cats)
Mountain Lion *Felix concolor*
Bobcat *Lynx rufus*

Order: Artiodactyla (Hoofed Mammals)
Family: Cervidae (Deer)
Rocky Mountain Elk *Cervus canadensis*
Mule Deer *Odocoileus hemionus*

Family: Antilocapridae (Pronghorn)
Pronghorn *Antilocapra americana*

Reptiles

Order: Squamata (Lizards, Snakes)
Family: Iguanidae (Iguanas and Their Kin)
Long-nosed Leopard Lizard *Gambelia wislizenii*
Desert Spiny Lizard *Sceloporus magister*
Western Fence Lizard *Sceloporus occidentalis*
Sagebrush Lizard *Sceloporus* graciosus
Side-blotched Lizard *Uta stansburiana*
Desert Horned Lizard *Phrynosoma platyrhinos*

Family: Scincidae (Skinks)
Western Skink *Eumeces skiltonianus*

Family: Teiidae (Whiptails)
Western Whiptail *Cnemidophorus tigrus*

Family: Colubridae (Colubrid Snakes)
Ringneck Snake *Diadophis punctatus*
Racer *Coluber constrictor*
Striped Whipsnake *Masticophis taeniatus*
Gopher Snake *Pituophis melanoleucus*
Long-nosed Snake *Rhinocheilus lecontei*
Western Terrestrial Garter *Thamnophis elegans*
Ground Snake *Sonora semiannulata*
Night Snake *Hypsiglena torquata*

Family: Viperidae (Vipers)
Great Basin Rattlesnake *Crotalus viridis lutosus*

Amphibians

Family: Pelobatidae (Spadefoots)
Great Basin Spadefoot Toad *Scaphiopus intermontanus*

Family: Ranidae (True Frogs)
Spotted Frog *Rana pretiosa*
Bullfrog *Rana catesbeiana*

Updated: 1/2002 - Peter V. Bradley - Nevada Division of Wildlife - Elko.

Note: This list is a combination of wildlife sight record data and our best effort to predict what wildlife would exist in this area in all seasons and in optimum habitat conditions.

APPENDIX G

BLM Sensitive Species List

BLM SENSITIVE SPECIES

SENSITIVE SPECIES are taxa that are not already included as BLM Special Status Species under (1) Federally listed, proposed, or candidate species; or (2) State of Nevada listed species. BLM policy is to provide these species with the same level of protection as is provided for candidate species in BLM Manual 6840.06 C, that is to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed". The Sensitive Species designation is normally used for species that occur on Bureau administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. The BLM Manual 6840.06 E provides factors by which a native species may be listed as "sensitive" if it:

1. **Could become endangered or extirpated from a state, or within a significant portion of its range in the foreseeable future;**

2. **Is under status review by the FWS and/or National Marine Fisheries Service;**

3. **Is undergoing significant current or predicted downward trends in: (1) habitat capability that would reduce a species' existing distribution; and/or (2) population or density such that federally listed, proposed, candidate, or State listed status may become necessary.**

4. **Typically consists of small and widely dispersed populations;**

5. **Inhabits ecological refugia, or specialized or unique habitats;**

6. **Is State-listed, but which may be better conserved through application of BLM sensitive species status.**

Scientific Name	Common Name	Factor(s)
Mammals (31 total)		
Antrozous pallidus	pallid bat	4,5
Brachylagus idahoensis	pygmy rabbit	1,2,3,4
Corynorhinus townsendii	Townsend's big-eared bat	4,5
Eptesicus fuscus	big brown bat	4,5
Euderma maculatum	spotted bat	1,2,4,5
Eumops perotis californicus	greater western mastiff bat	4,5
Idionycteris phyllotis	Allen's lappet-browed bat	4,5
Lasionycteris noctivagans	silver-haired bat	4,5
Lasiurus blossevilli	western red bat	4,5
Lasiurus cinereus	hoary bat	4,5
Lontra canadensis	river otter	4,5
Macrotus californicus	California leaf-nosed bat	4,5
Microdipodops megacephalus albiventer	Desert Valley kangaroo mouse	5
Microdipodops megacephalus nasutus	Fletcher dark kangaroo mouse	5
Microtus montanus fucosus	Pahranagat Valley montane vole	5
Microtus montanus nevadensis	Ash Meadows montane vole	5
Myotis californicus	California myotis	4,5
Myotis ciliolabrum	small-footed myotis	4,5
Myotis evotis	long-eared myotis	4,5
Myotis lucifugus	little brown myotis	4,5
Myotis thysanodes	fringed myotis	4,5
Myotis velifer	cave myotis	4,5
Myotis volans	long-legged myotis	4,5
Myotis yumanensis	Yuma myotis	4,5
Nyctinomops macrotis	big free-tailed bat	4,5
Ovis canadensis nelsoni	desert bighorn sheep	3,4,5
Pipistrellus hesperus	western pipistrelle bat	4,5
Sorex preblei	Preble's shrew	4,5
Tadarida braziliensis	Brazilian free-tailed bat	5
Thomomys bottae abstrusus	Fish Spring pocket gopher	5
Thomomys bottae curtatus	San Antonio pocket gopher	5

Birds (33 total)

Accipiter gentilis	**Northern Goshawk**	**3,4,5**
Agelaius tricolor	**Tricolored Blackbird**	**3,4,5**
Aquila chrysaetos	**Golden Eagle**	**4,6**
Asio flammeus	**Short-eared Owl**	**4**
Asio otus	**Long-eared Owl**	**4**
Athene cunicularia	**Burrowing Owl**	**3,4**
Baeolophus griseus	**Juniper Titmouse**	**4,5**
Buteo regalis	**Ferruginous Hawk**	**4,5**
Buteo swainsoni	**Swainson's Hawk**	**4,5**
Centrocercus urophasianus	**Greater Sage-Grouse**	**2,3**
Charadrius alexandrinus	**Snowy Plover**	**3,4**
Chlidonias niger	**Black Tern**	**3,4.5**
Dolichonyx oryzivorus	**Bobolink**	**3,4**
Falco mexicanus	**Prairie Falcon**	**3,4**
Falco peregrinus	**Peregrine falcon**	**3,4,5**
Grus canadensis	**Sandhill Crane**	**5**
Gymnorhinus cyanocephalus	**Pinyon Jay**	**3,5**
Icteria virens	**Yellow-breasted Chat**	**4,5**
Ixobrychus exilis	**Least Bittern**	**5**
Lanius ludovicianus	**Loggerhead Shrike**	**2,3,4**
Leucosticte atrata	**Black Rosy-Finch**	**5**
Melanerpes lewis	**Lewis's Woodpecker3**	
Numenius americanus	**Long-billed Curlew**	**5**
Oreortyx pictus	**Mountain quail**	**3,4,5**
Otus flammeolus	**Flammulated Owl**	**4**
Phainopepla nitens	**Phainopepla**	**5**
Pooecetes gramineus	**Vesper Sparrow**	**3**
Sphyrapicus nuchalis	**Red-naped Sapsucker**	**3**
Toxostoma crissale	**Crissal Thrasher**	**3,5**
Toxostoma lecontei	**LeConte's Thrasher**	**3,5**
Tympanuchus phasianellus columbianus	**Columbian Sharp-tailed Grouse**	**1,3,4**
Vermivora luciae	**Lucy's Warbler**	**3,5**
Vireo vicinior	**Gray Vireo**	**3,5**

Reptiles (6 total)

Elgaria coerulea palmeri	Sierra alligator lizard	5
Eumeces gilberti rubricaudatus	western red-tailed skink	5
Heloderma suspectum	Gila monster	4,5,6
Lampropeltis pyromelana	Sonoran mountain kingsnake	5
Phrynosoma douglassii	short-horned lizard	5
Sauromalus obesus	Chuckwalla	5

Amphibians (3 total)

Bufo microscaphus	Southwestern toad	4,5
Bufo nelsoni	Amargosa toad	3,5
Rana pipiens	northern leopard frog	1,3,5

Fishes (25 total)

Catostomus clarki intermedius	White River desert sucker	5
Catostomus clarki ssp.	Meadow Valley Wash desert sucker	5
Catostomus latipinnis	flannelmouth sucker	3,5
Catostomus sp.	Wall Canyon sucker	3,5
Crenichthys baileyi albivallis	Preston White River springfish	5
Crenichthys baileyi thermophilus	Moorman White River springfish	5
Gila bicolor euchila	Fish Creek Springs tui chub	5
Gila bicolor isolata	Independence Valley tui chub	5
Gila bicolor newarkensis	Newark Valley tui chub	5
Gila bicolor ssp.	Big Smoky Valley tui chub	5
Gila bicolor ssp.	Fish Lake Valley tui chub	5
Gila bicolor ssp.	Hot Creek Valley tui chub	5
Gila bicolor ssp.	Railroad Valley tui chub	3,5
Gila seminuda (Muddy River population only)	Virgin River chub	3,5
Lepidomeda mollispinis mollispinis	Virgin River spinedace	5
Oncorhynchus clarki bouvieri	Yellowstone cutthroat trout	5
Oncorhynchus clarki utah	Bonneville cutthroat trout	5
Oncorhynchus mykiss gairdneri	interior redband trout	5
Relictus solitarius	relict dace	5
Rhinichthys osculus lariversi	Big Smoky Valley speckled dace	5
Rhinichthys osculus moapae	Moapa speckled dace	5
Rhinichthys osculus velifer	Pahranagat speckled dace	3,5

Rhinichthys osculus ssp.	Meadow Valley Wash speckled dace	5
Rhinichthys osculus ssp.	Monitor Valley speckled dace	5
Rhinichthys osculus ssp.	Oasis Valley speckled dace	3,5
Rhinichthys osculus ssp.	White River speckled dace	3,5
Snails (26 total)		
*Oreohelix nevadensis*Sch	ell Creek mountainsnail	5
Pyrgulopsis aloba	Duckwater pyrg	5
Pyrgulopsis anatina	southern Duckwater pyrg	5
Pyrgulopsis augusta	elongate Cain Spring pyrg	5
*Pyrgulopsis basiglans*l	arge-gland Carico pyrg	5
Pyrgulopsis bruesi	Fly Ranch pyrg	5
Pyrgulopsis carinata	carinate Duckwater pyrg	5
Pyrgulopsis cruciglans	transverse gland py rg	5
Pyrgulopsis deaconi	Spring Mountains pyrg	5
Pyrgulopsis dixensis	Dixie Valley pyrg	5
Pyrgulopsis humboldtensis	Humboldt pyrg	5
Pyrgulopsis landeyi	Landyes pyrg	5
Pyrgulopsis limaria	squat Mud Meadows pyrg	5
Pyrgulopsis micrococcus	Oasis Valley pyrg	5
Pyrgulopsis militaris	northern Soldier Meadow pyrg	5
Pyrgulopsis orbiculata	sub-globose Steptoe Ranch pyrg	5
Pyrgulopsis papillata	Big Warm Spring pyrg	5
Pyrgulopsis peculiaris	bifid duct py rg	5
Pyrgulopsis pictilis	ovate Cain Spring pyrg	5
Pyrgulopsis sulcata	southern Steptoe pyrg	5
Pyrgulopsis umbilicata	southern Soldier Meadow pyrg	5
Pyrgulopsis villacampae	Duckwater Warm Springs pyrg	5
Pyrgulopsis vinyardi	Vinyards pyrg	5
Pyrgulopsis wongi	Wongs pyrg	5
Tryonia clathrata	grated tryonia	5
T. variegata	Amargosa tryonia	5
Clams & Mussels (1 total)		
Anodonta californiensis	California floater	4,5

Ants, Wasps, Bees (2 total)

Andrena balsamorhiza	Mojave gypsum bee	5
Perdita meconis	Mojave poppy bee	5

True Bugs (1 total)

Pelocoris shoshone shoshone	Pahranagat naucorid bug	5

Beetles (14 total)

Aegialia crescenta	Crescent Dune aegialian scarab	5
Aegialia hardyi	Hardy's aegialian scarab	5
Aegialia knighti	aegialian scarab beetle	5
Aegialia magnifica	large aegialian scarab	5
Aphodius sp.	Crescent Dune aphodius scarab	5
Aphodius sp	Big Dune aphodius scarab	5
Aphodius sp.	Sand Mountain aphodius scarab	5
Miloderes sp.	Rulien's miloderes weevil	5
Pseudocotalpa giulianii	Giuliani's dune scarab	5
Serica psammobunus	Sand Mountain serican scarab	5
Serica ammomenisco	Crescent Dune serican scarab	5
Serica humboldti	Humboldt serican scarab	5
Stenelmis calida calida	Devils Hole warm spring riffle beetle	5
Stenelmis moapa	Moapa warm spring riffle beetle	5

Butterflies (28 total)

Cercyonis oetus alkalorum	Big Smoky wood nymph	5
Cercyonis oetus pallescens	pallid wood nymph	5
Cercyonis pegala carsonensis	Carson Valley wood nymph	5
Cercyonis pegala pluvialis	White River wood nymph	5
Chlosyne acastus robusta	Spring Mountains acastus checkerspot	5
Euphilotes ancilla giulianii	Giuliani's blue	5
Euphilotes ancilla shieldsi	Shield's blue	5
Euphilotes battoides fusimaculata	fused battoides blue	5
Euphilotes bernadino minuta	Baking Powder Flat blue	5
Euphilotes enoptes primavera	early blue	5
Euphilotes mojave virginensis	northern Mojave blue	5
Euphilotes pallescens arenamontana	Sand Mountain blue	5

Euphilotes pallescens calneva	Honey Lake blue	5
Euphilotes pallescens mattonii	Mattoni's blue	5
Euphilotes pallescens ricei	Rice's blue	5
Euphydryas editha koreti	Koret's checkerspot	5
Euphydryas editha monoensis	Mono checkerspot	5
Hesperia miriamae longaevicola	White Mountains skipper	5
Hesperia uncas fulvapalla	Railroad Valley skipper	5
Hesperia uncas giulianii	Mono Basin skipper	5
Hesperia uncas grandiosa	White River Valley skipper	5
*Hesperopsis gracielae*MacNei	ll sooty wing skipper	5
Phyciodes pascoensis arenacolor	Steptoe Valley crescentspot	5
Philotiella speciosa septentrionalis	Great Basin small blue	5
Polites sabuleti sinemaculata	Denio sandhill skipper	5
Pseudocopaeodes eunus alinea	Ash meadows alkali skipper	5
Speyeria hesperis greyi	Grey's silverspot	5
Speyeria nokomis carsonensis	Carson Valley silverspot	5

Plants (106 total)

Angelica scabrida	rough angelica	5
Antennaria arcuata	meadow pussytoes	5
Arabis bodiensis	Bodie Hills rockcress	5
Arabis falcatoria	Grouse Creek rockcress	5
Arabis falcifructa	Elko rockcress	5
Arctomecon merriamii	white bearpoppy; Merriam b.	3,5
Asclepias eastwoodiana	Eastwood milkweed	4
Astragalus aequalis	Clokey milkvetch; equal m.	5
Astragalus amphioxys var. *musimonum*	Sheep Mountain milkvetch; crescent m.	5
Astragalus anserinus	Goose Creek milkvetch	5
Astragalus eurylobus	Needle Mountains milkvetch; Peck Station m.	5
Astragalus funereus	black woollypod; Funeral milkvetch; black m.; Rhyolite m.	5
Astragalus gilmanii	Gilman milkvetch	5
Astragalus mohavensis var. *hemygyrus*	halfring milkvetch; curvepod Mojave m.; Darwin Mesa m.	5
Astragalus mokiacensis	Mokiak milkvetch	5
Astragalus oophorus var. *lavinii*	Lavin eggvetch	5

Astragalus oophorus var. *lonchocalyx*	long-calyx eggvetch; pink e.	5
Astragalus remotus	Spring Mountains milkvetch	5
Astragalus robbinsii var. *occidentalis*	Lamoille Canyon milkvetch; Ruby m.; Robbin's western m.	5
Astragalus solitarius	lonesome milkvetch; weak m.	5
Astragalus tiehmii	Tiehm milkvetch	5
Astragalus toquimanus	Toquima milkvetch	5
Astragalus uncialis	Currant milkvetch	5
Botrychium crenulatum	dainty moonwort; crenulate m.	5
Calochortus striatus	alkali mariposa lily; striped m. l.	5
Camissonia megalantha	Cane Spring evening-primrose	5
Chrysothamnus eremobius	remote rabbitbrush; Pintwater r.	5
Collomia renacta	Barren Valley collomia	5
Cordylanthus tecopensis	Tecopa birdbeak	5
Cryptantha schoolcraftii	Schoolcraft catseye	5
Cryptantha welshii	White River catseye; Welsh c.	5
Cusickiella quadricostata	Bodie Hills draba; four-rib whitlowgrass	5
Cymopterus goodrichii	Goodrich biscuitroot; G. parsley	5
Cymopterus ripleyi var. *saniculoides*	sanicle biscuitroot; Ripley b.	5
Dermatocarpon luridum	stream stippleback lichen	5
Didymodon nevadensis	Gold Butte moss	5
Enceliopsis argophylla	silverleaf sunray	5
Epilobium nevadense	Nevada willowherb	5
Erigeron latus	broad fleabane	5
Erigeron ovinus	sheep fleabane	5
Eriogonum anemophilum	windloving buckwheat	5
Eriogonum bifurcatum	Pahrump Valley buckwheat; forked b.	5
Eriogonum corymbosum	Las Vegas buckwheat	5
Eriogonum crosbyae	Crosby buckwheat	5
Eriogonum diatomaceum	Churchill Narrows buckwheat	5
Eriogonum heermannii var. *clokeyi*	Clokey buckwheat	5
Eriogonum lewisii	Lewis buckwheat	5
Eriogonum phoeniceum	scarlet buckwheat	5
Eriogonum prociduum	prostrate buckwheat; Austin b.	5
Eriogonum robustum	altered andesite buckwheat; Lobb b.	5
Eriogonum tiehmii	Tiehm buckwheat	5
Eustoma exaltatum	catchfly gentian	5

Galium hilendiae ssp. *kingstonense*	Kingston bedstraw	5
Glossopetalon pungens var. *glabrum*	smooth dwarf greasebush	5
Glossopetalon pungens var. *pungens*	rough dwarf greasebush	5
Ionactis caelestis	Red Rock Canyon aster	5
Ivesia aperta var. *aperta*	Sierra Valley ivesia	5
Ivesia arizonica var. *saxosa*	rock purpusia	5
Ivesia jaegeri	Jaeger ivesia	5
Ivesia pityocharis	Pine Nut Mountains ivesia; P.N.M. mousetails	5
Ivesia rhypara var. *rhypara*	grimy ivesia	5
Jamesia tetrapetala	waxflower	5
Lathyrus grimesii	Grimes vetchling	5
Lepidium davisii	Davis peppergrass	5
Lepidium montanum var. *nevadense*	Pueblo Valley peppergrass	5
Leptodactylon glabrum	Bruneau River prickly phlox; Owyhee p. p.	5
Lotus argyraeus var. *multicaulis*	scrub lotus	5
Lupinus holmgrenianus	Holmgren lupine	5
Mentzelia argillicola	Pioche blazingstar	5
Mentzelia mollis	smooth stickleaf	5
Mentzelia tiehmii	Tiehm blazingstar	5
Oryctes nevadensis	oryctes	5
Parthenium ligulatum	ligulate feverfew	5
Penstemon albomarginatus	white-margined beardtongue	5
Penstemon arenarius	Nevada dune beardtongue	5
Penstemon bicolor ssp. *bicolor*	yellow twotone beardtongue	5
Penstemon bicolor ssp. *roseus*	rosy twotone beardtongue	5
Penstemon concinnus	Tunnel Springs beardtongue	5
Penstemon floribundus	Cordelia beardtongue	5
Penstemon fruticiformis ssp. *amargosae*	Death Valley beardtongue; Amargosa bush penstemon	5
Penstemon pahutensis	Pahute Mesa beardtongue	5
Penstemon palmeri var. *macranthus*	Lahontan beardtongue	5
Penstemon pudicus	bashful beardtongue	5
Penstemon tiehmii	Tiehm beardtongue	5
Phacelia beatleyae	Beatley scorpion plant	5
Phacelia filiae	overlooked phacelia; Clarke phacelia	5

Phacelia inundata	playa phacelia	5
Phacelia minutissima	least phacelia; dwarf phacelia	5
Phacelia monoensis	Mono phacelia	5
Phacelia parishii	Parish phacelia; playa p.	5
Pinus washoensis	Washoe pine	5
Plagiobothrys glomeratus	altered andesite popcornflower	5
Porophyllum pygmaeum	pygmy poreleaf	5
Potentilla cottamii	Cottam cinquefoil	5
Salvia dorrii var. *clokeyi*	Clokey mountain sage; C. purple sage	5
Sclerocactus blainei	Blaine pincushion; B. fishhook cactus	5
Sclerocactus nyensis	Nye pincushion	5
Sclerocactus schlesseri	Schlesser pincushion; S. fishhook cactus	5
Silene nachlingerae	Jan's catchfly; Nachlinger catchfly	5
Sphaeralcea caespitosa var. *williamsiae*	Railroad Valley globemallow	5
Streptanthus oliganthus	Masonic Mountain jewelflower; M. M. twistflower	5
Stroganowia tiehmii	Tiehm stroganowia	5
Tonestus graniticus	Lone Mountain tonestus	5
Townsendia jonesii var. *tumulosa*	Charleston grounddaisy	5
Trifolium andinum var. *podocephalum*	Currant Summit clover	5
Trifolium leibergii	Leiberg clover	5
Viola lithion	rock violet	5

APPROVED BY

Signed by:
Robert V. Abbey
State Director, Nevada
U.S. Bureau of Land Management
07-01-03
Date

Signed by:
R. Michael Turnipseed, P.E.
Director, Nevada Department of Conservation and Natural Resources
07-10-03
Date

Signed by:
Terry R. Crawforth
Director, Nevada Department of Wildlife
07-14-03
Date

APPENDIX H

Air Quality Modeling Report

BARRICK GOLD U.S., INC.
BALD MOUNTAIN MINE
WHITE PINE COUNTY, NEVADA

AIR QUALITY IMPACT ASSESSMENT REPORT

February 2008

Prepared for

Barrick Gold U.S., Inc.
Bald Mountain Mine
P.O. Box 2706
Elko, Nevada 89503

Prepared by

Enviroscientists, Inc.
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BARRICK GOLD U.S., INC.
BALD MOUNTAIN MINE
WHITE PINE COUNTY, NEVADA

AIR QUALITY IMPACT ASSESSMENT REPORT

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BARRICK GOLD U.S., INC.
BALD MOUNTAIN MINE
WHITE PINE COUNTY, NEVADA

AIR QUALITY IMPACT ASSESSMENT REPORT

1. INTRODUCTION

Barrick Gold U.S., Inc. (BGI) has proposed to combine the Bald Mountain Mine (BMM) and the Mooney Basin Plan areas into one Plan of Operations boundary called the North Operations Area (Proposed Action). The Proposed Action has several components described in BGI Amendment to Plans of Operations (Plan) (PDI 2006). This analysis considers the impacts from the operation of stationary and mobile equipment that constitute a part of the regular activities of the mining process. The purpose of the Proposed Action is to continue to extract gold from mined ore within the BMM and Mooney Basin areas (Project Area). The Proposed Action is designed to optimize the development of gold mineralization with the existing processing facilities. It includes the expansion and/or development of the North Operations Area boundary by 3,738 acres to encompass a total boundary of 16,465 acres. Within the BMM Plan boundary area the Proposed Action includes the following: expansion of the North Pit 1, North Pit 2, North Pit 3, Rat Pit, Top/Sage Pit Complex, and the BMM No. 2/3 Heap Leach Pad; expansion of the Rock Disposal Areas (RDAs) including North 1, North 4, Rat West, South Water Canyon, and East Sage; and development of RDAs North 2, North 3, North 5, and Sage Flat. The Proposed Action within the Mooney Basin Plan boundary will include the following: expansion of the East Bida Pit, Belmont Pit 2, Sage Pit, and Mooney Heap Leach Pad; and development of Belmont Pit 3 and new Mooney process facilities and ponds. The Proposed Action also entails the expansions and new construction of haul roads, expansion of interpit areas, and development of growth media stockpiles within the Project Area. The development and expansion of the Project Area would result in up to an additional 12 years of mining and processing.

1.1. Purpose

The purpose of this Air Quality Impact Assessment Report (Report) is to assess the potential impacts to air quality resulting from the Proposed Action. This assessment has been prepared by Enviroscientists, Inc. (Enviroscientists) for use in the Bald Mountain North Operations Area EIS (EIS) and the methodologies used are consistent with National Environmental Policy Act (NEPA) guidelines developed by the Council on Environmental Quality (CEQ) and the Bureau of Land Management (BLM), the federal lead agency for the preparation of the EIS.

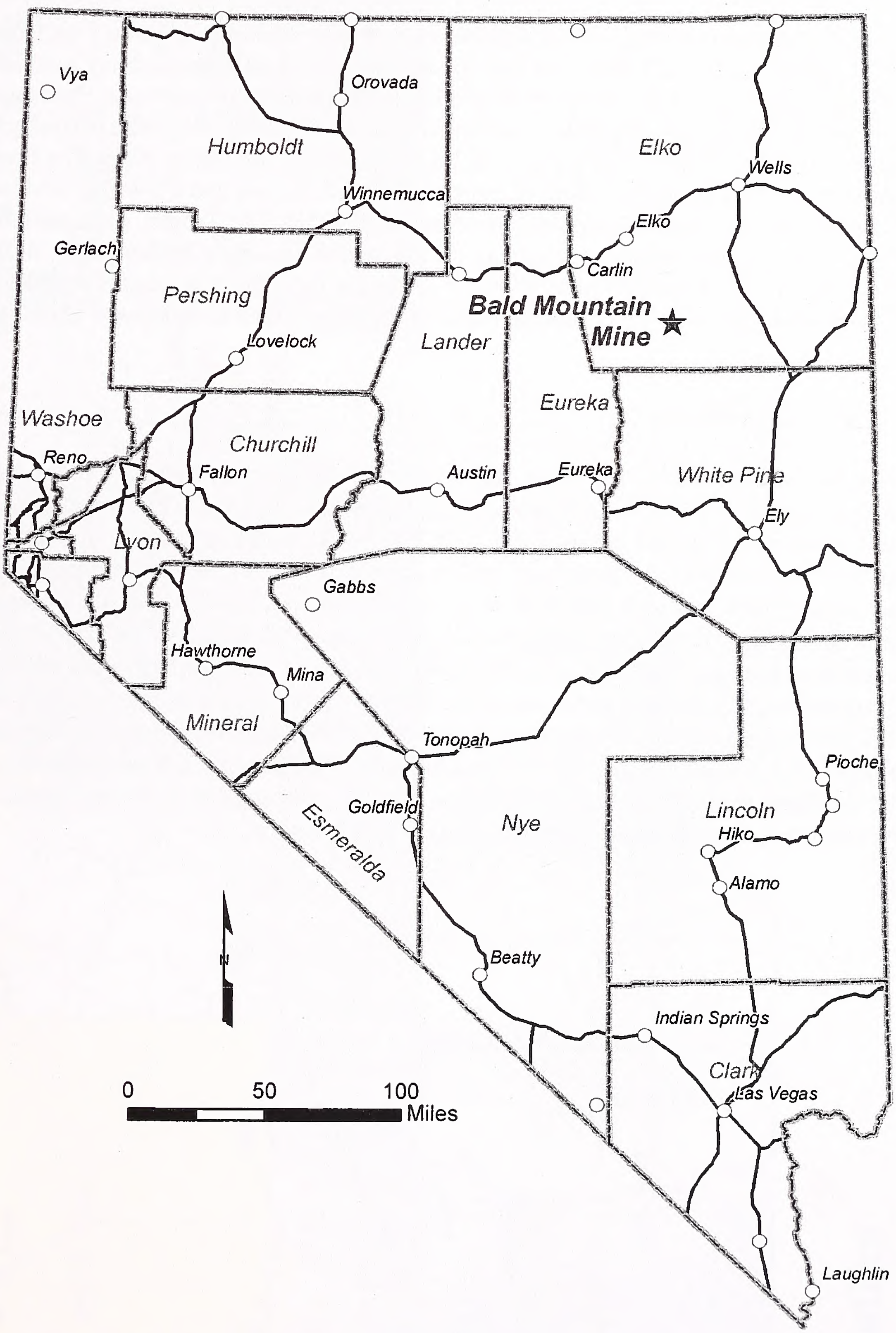


Figure 1.1. General Location Map

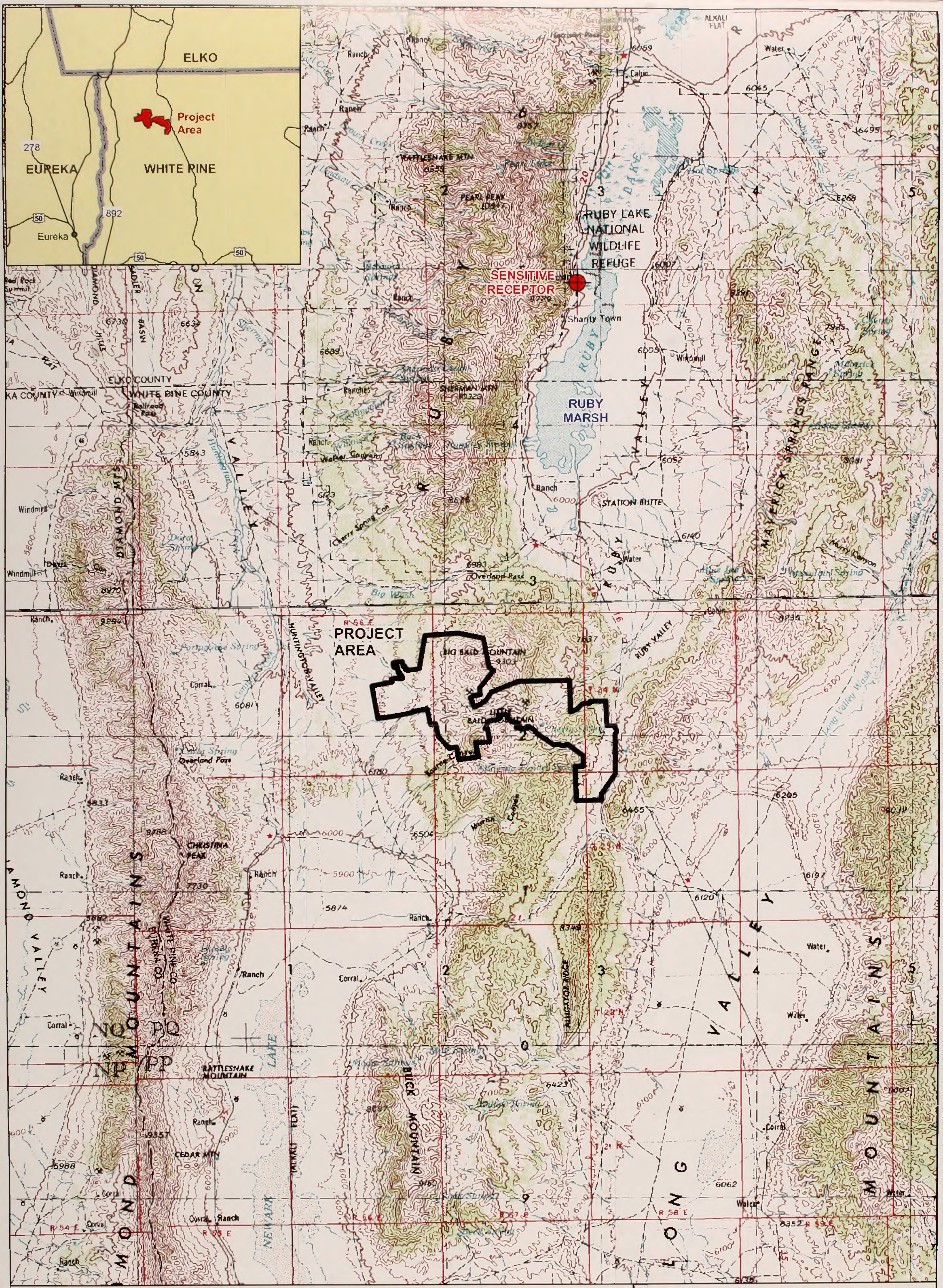
1804GeneralLocationMap.mxd

1.2. Project Location

The Project is located approximately 65 miles northwest of Ely, Nevada, in White Pine County (Figure 1.1). The Project can be reached from four different access routes. Directions are as follows: from Elko, Nevada, State Highway 228 (Jiggs Highway) south; from Eureka, Nevada, Highway 50 to State Highway 892 (Strawberry Highway); and from Ely, State Highway 50 to State Highway 892 (Strawberry Highway); or alternatively using State Highway 50 to Long Valley Road. The Project Area is located within Township 24 North, Ranges 56, 57, and 58 East and Township 23 North, Ranges 57 and 58, Mount Diablo Base and Meridian (MDB&M). The Project Area comprises approximately 16,465 acres of unpatented mining claims owned, leased, or controlled by BGI on BLM administered public or private land. Figure 1.2 depicts the Project's primary operational centers along the southern Ruby Mountains in portions of Ruby, Newark, Long, and Huntington Valleys.

1.3. Project Description

The Proposed Action is the unification of the BMM and Mooney Basin operations into the North Operations Area. (Figure 1.3). The total proposed disturbance is 7,968 acres, which includes 3,808 acres of new disturbance primarily in the BMM area. The activities associated with the Proposed Action that have a potential to impact air quality consist of the following: expansion and development of the BMM area open pits with its associated heap leach and RDAs; the expansion of the Mooney Basin plan area open pits and associated RDAs, heap leach facilities, and the refinery processing facilities. Based on the Plan, an optimum operating scenario of the two larger open pits, North and Top/Sage Complex, are considered under the Proposed Action. The daily mining rate in the North Pit will average 95,000 tons per day while the Top/Sage complex open pit will average 125,000 tons per day. Figure 1.3 depicts the various Project components. The associated in-pit handling, ore handling, waste handling, heap leaching, refinery, crushing circuit, storage tanks, and a related operational sources of emissions are addressed in this report.



Explanation

- Sensitive Receptor
- Proposed BMM 2006 PoO Boundary

0 2.5 5 7.5 10 Kilometers

0 2 4 6 8 Miles

1:225,000

Projection: NAD 27, UTM Zone 11

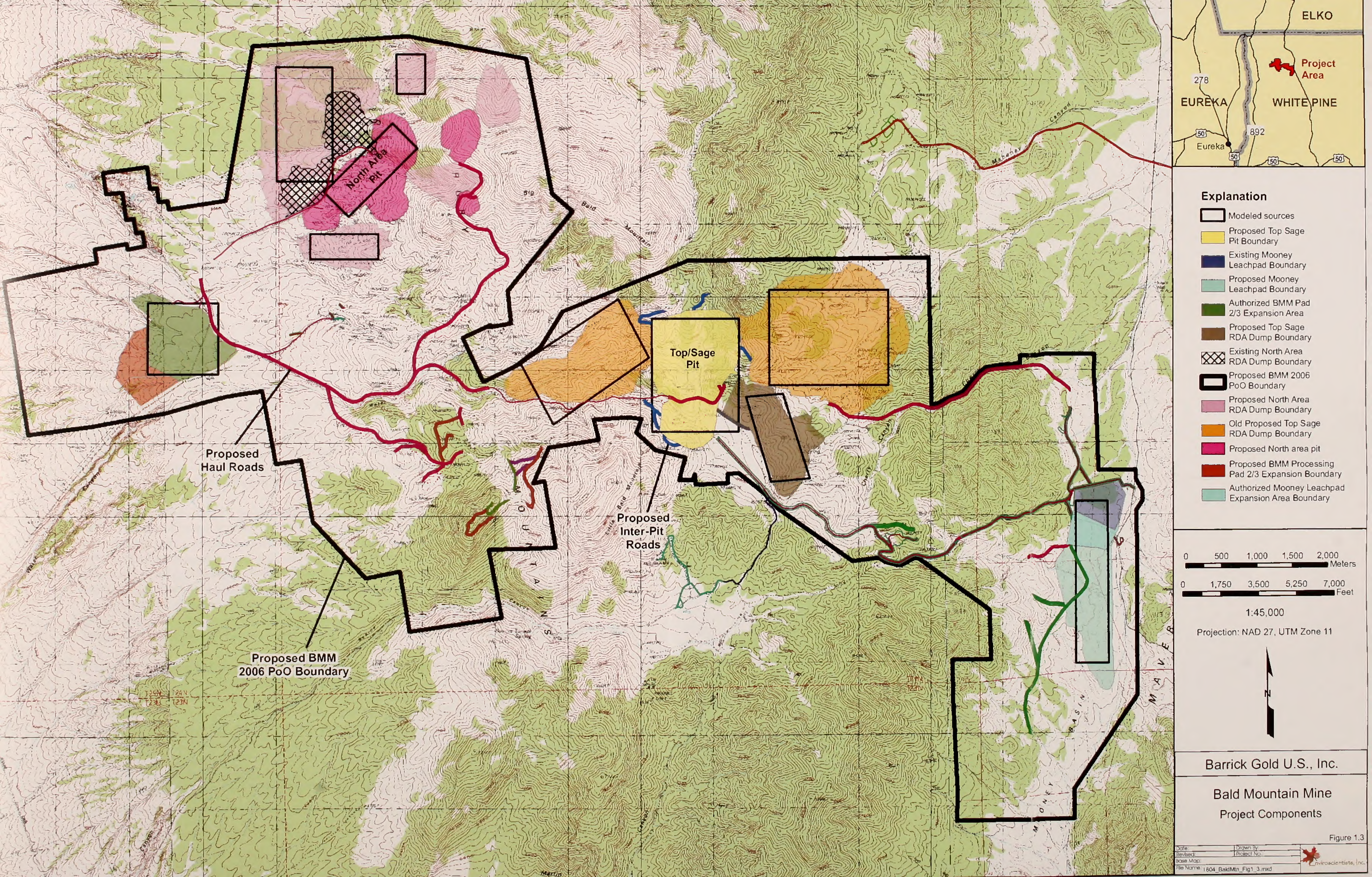
Barrick Gold U.S., Inc.

Bald Mountain Mine
Combined Operations

Figure 1.2

Date:	Drawn By:
Revised:	Project No.
Base Map:	
File Name: 1804_BaldMtn_Fig1_2	

enviroscientists, Inc.



ELKO
Project Area
278
EUREKA
WHITE PINE
50
892
Eureka
50
50
50
North Area Pit
Top/Sage Pit
Proposed Haul Roads
Proposed Inter-Pit Roads
Proposed BMM 2006 PoO Boundary
Explanation
Modeled sources
Proposed Top Sage Pit Boundary
Existing Mooney Leachpad Boundary
Proposed Mooney Leachpad Boundary
Authorized BMM Pad 2/3 Expansion Area
Proposed Top Sage RDA Dump Boundary
Existing North Area RDA Dump Boundary
Proposed BMM 2006 PoO Boundary
Proposed North Area RDA Dump Boundary
Old Proposed Top Sage RDA Dump Boundary
Proposed North area pit
Proposed BMM Processing Pad 2/3 Expansion Boundary
Authorized Mooney Leachpad Expansion Area Boundary
0 500 1,000 1,500 2,000 Meters
0 1,750 3,500 5,250 7,000 Feet
1:45,000
Projection: NAD 27, UTM Zone 11
N
Barrick Gold U.S., Inc.
Bald Mountain Mine
Project Components
Figure 1.3
Date:
Drawn By:
Revised:
Project No.:
Base Map:
File Name: 1804_BaldMtn_Fig1_3.mxd

2. REGULATORY FRAMEWORK

Ambient air quality and the emission of air pollutants are regulated under both federal and State of Nevada laws and regulations. The following is a discussion of these requirements.

2.1. Federal Clean Air Act

The Federal Clean Air Act (CAA), and the subsequent Federal Clean Air Act Amendments of 1990 (CAAA), require the Environmental Protection Agency (EPA) to identify national ambient air quality standards (NAAQSs) to protect public health and welfare. The CAA and the CAAA established NAAQSs for seven pollutants, known as "criteria" pollutants because the ambient standards set for these pollutants satisfy "criteria" specified in the CAA. A list of the criteria pollutants regulated by the CAA, and their currently applicable NAAQSs set by the EPA for each, are listed in Table 2.1.

The list of criteria pollutants was amended by the EPA on July 18, 1997, to include two new standards for particulate matter of aerodynamic diameter less than 2.5 micrometers ($PM_{2.5}$), and to revise the standards for PM_{10} and O_3 (see 62 *Federal Register* 38652-38760 [$PM_{2.5}$ and PM_{10}]; 62 *Federal Register* 38856-38896 [O_3]). In April 2005, EPA published a final list of $PM_{2.5}$ nonattainment areas (70 *Federal Register* 19844). Local regulatory agencies were allowed three years to submit an implementation plan for those areas designated as nonattainment of the $PM_{2.5}$ standard (70 *Federal Register* 65983-66067). No areas in Nevada were designated as nonattainment of the $PM_{2.5}$ standard. Currently, the EPA is considering revising the particulate standards (71 *Federal Register* 2620). If revised, the new particulate standards may not be implemented until 2020. Since there is a lack of sufficient data to develop a comprehensive emissions inventory, the $PM_{2.5}$ standard will not be addressed in this document.

Pursuant to the CAA, the EPA has developed classifications for distinct geographic regions known as Air Pollution Control Regions (APCRs). In Nevada, the APCRs are largely coincident with hydrographic basins. Under these classifications, for each federal criteria pollutant, an area (an APCR or portion there of) is classified as in "attainment", if the area has "attained" compliance with (that is, not exceeded) the adopted NAAQS for that pollutant, is classified as "non-attainment" if the levels of ambient air pollution exceed the NAAQS for that pollutant, or is classified as "maintenance" if the monitored pollutants have fallen from non-attainment levels to attainment levels. Areas for which sufficient ambient monitoring data are not available are designated as "attainment, unclassifiable" for those particular pollutants.

In addition to the designations relative to attainment of conformance with the NAAQS, the CAA requires the EPA to place selected areas within the United States into one of three classes, which are designed to limit the deterioration of air quality when it is "better than" the NAAQS. "Class I" is the most restrictive air quality category, and was created by Congress to prevent further deterioration of air quality in National Parks and Wilderness Areas of a given size, which were in existence prior to 1977, or those additional areas that have since been designated Class I under federal regulations (40 Code of Federal Register (CFR) 52.21). All remaining areas outside of the designated Class I boundaries were designated Class II areas, which allow a relatively greater deterioration of air quality, although still below NAAQSs. No Class III areas have been designated.

Table 2.1: Federal and State Ambient Air Quality Standards for Criteria Pollutants

Criteria Pollutant	Averaging Period	Nevada Standards	Federal Standards	
		Concentration[a]	Primary[a]	Secondary[a]
Ozone (O_3)	1-Hour	120 ppbv (235 μg/m^3)	120 ppbv (235 μg/m^3)	Same as Primary Standards
	8-Hour	---	80 ppbv (157 μg/m^3)	
Carbon Monoxide (CO)	8-Hour (<5,000') [b]	9 ppmv (10 mg/m^3)	9 ppmv (10 mg/m^3)	---
	8-Hour (≥5,000') [b]	6 ppmv (6.67 mg/m^3)	9 ppmv (10 mg/m^3)	
	1-Hour [b]	35 ppmv (23 mg/m^3)	35 ppmv (40 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual	100 μg/m^3 (53 ppbv)	100 μg/m^3 (53 ppbv)	Same as Primary Standards
Sulfur Dioxide (SO_2)	Annual	80 μg/m^3 (30 ppbv)	80 μg/m^3 (30 ppbv)	---
	24-Hour [b]	365 μg/m^3 (140 ppbv)	365 μg/m^3 (140 ppbv)	---
	3-Hour [b]	1,300 μg/m^3 (500 ppbv)	---	1,300 μg/m^3 (500 ppbv)
Particulate Matter ≤ 10 Microns in Aerodynamic Diameter (PM_{10})	24-Hour [b]	150 μg/m^3	150 μg/m^3	Same as Primary Standards
	24-Hour (Based on the 99th Percentile Averaged over Three Years)	---	150 μg/m^3	
	Annual Arithmetic Mean	50 μg/m^3	50 μg/m^3	
Particulate Matter ≤ 2.5 Microns in Aerodynamic Diameter ($PM_{2.5}$)	24-Hour (Based on the 98th Percentile Averaged over Three Years)	---	65 μg/m^3	
	Annual Arithmetic Mean Averaged Over Three Years	---	15 μg/m^3	
Lead (Pb)	Calendar Quarter	1.5 μg/m^3	1.5 μg/m^3	Same as Primary Standards

a Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm mercury. Measurements of air quality are corrected to a reference temperature of 25°C and a reference pressure of 760 mm mercury (1,013.2 millibar); ppmv and ppbv in this table refer to parts per million by volume and parts per billion by volume, respectively, or micro-moles of pollutant per mole of gas. μg/m^3 ≡ micrograms per cubic meter.

b A violation of the federal standard occurs on the second exceedence during a calendar year; a violation of the State of Nevada standard occurs on the first exceedence during a calendar year.

Federal Prevention of Significant Deterioration (PSD) regulations limit the maximum allowable increase in ambient particulate matter in a Class I area resulting from a major or minor stationary source to five μg/m^3 (annual geometric mean) and ten μg/m^3 (24-hour average). Increases in other criteria pollutants are similarly limited. Specific types of "listed facilities" that emit, or have the potential to emit, 100 tons per year or more of PM, PM_{10}, or other criteria air pollutants, or any facility that emits, or has the potential to emit, 250 tons per year or more of PM, PM_{10}, or other criteria air pollutants, is considered a major stationary source. However, fugitive emissions are not counted as part of the determination of major source status for PSD for non-listed facilities, such as gold mines. Major stationary sources are required to notify federal land managers of Class I areas within 100 kilometers of the major stationary source. There are no Class I areas within 100 kilometers of the Project Area. The nearest Class I planning area to the Project Area, the Jarbidge Wilderness Area, is located approximately 130 miles (210 kilometers) north of the Project Area. Neither the existing BMM project air pollutant emission sources, nor the Proposed Action emission sources, are major stationary sources subject to PSD regulatory requirements.

The Class II pollution concentration limits are triggered for a planning area when an application for a major source affecting that planning area has been deemed complete by the regulatory authority (40 CFR 52.21[b][14]). The closest triggered Class II planning area (APCR 179) is located approximately 25 miles (40 kilometers) east of the Facility. The planning area in which the Facility is located has not been triggered for any pollutant.

New Source Performance Standards (NSPSs), also required under the CAA, are set by the EPA for specific types of new or modified stationary sources. NSPSs set fixed emission limits for classes of sources to prevent deterioration of air quality from the construction of new sources and to reduce control costs by building pollution controls into the initial design of sources. In establishing NSPSs, the EPA is required to consider cost, non-air impacts, and energy requirements. Certain Project units used to process metallic minerals are subject to the NSPSs found in 40 CFR Part 60, Subpart LL (Standards of Performance for Metallic Mineral Processing Plants).

The CAAA introduced a new a facility-wide permitting program known as the Federal Operating Permit, or "Title V", program, that requires facilities with the potential to emit more than 100 tons per year (tpy) of any regulated pollutant (excluding PM), ten tpy of any single hazardous air pollutant (HAP), or 25 tpy or more of any combination of HAPs, sources of air pollutants submit a Federal Operating Permit application.

The CAA directs the EPA to delegate primary responsibility for air pollution control to state governments, which comply with certain minimum requirements. State governments, in turn, often delegate this responsibility to local or regional governmental organizations. The State Implementation Plan (SIP) was originally the mechanism by which a state set emission limits and allocated pollution control responsibility to meet the NAAQSs. The function of a SIP broadened after passage of the CAAA, and now includes the implementation of specific technology-based emission standards, permitting of sources, collection of fees, coordination of air quality planning, and prevention of significant deterioration of air quality within regional planning areas and statewide. Section 176 of the CAA, as amended, requires that federal agencies must not engage in, approve, or support in any way any action that does not conform to a SIP for the purpose of attaining ambient air quality standards (Wooley 1998).

2.2. Nevada State Air Quality Program

The Bureau of Air Pollution Control (BAPC) is the agency in the State of Nevada that has been delegated the responsibility for implementing a SIP (excluding Washoe and Clark Counties, which have their own SIP). Included in the SIP are the State of Nevada air quality permit programs (NAC 445B.001 through 445B.3497, inclusive). Also part of the SIP are the Nevada State Ambient Air Quality Standards (NSAAQSs). The NSAAQSs are generally identical to the NAAQSs, with the exception of the following: (a) an additional standard for carbon monoxide (CO) in areas with an elevation in excess of 5,000 feet above sea level; (b) the recently promulgated NAAQSs for $PM_{2.5}$ (Nevada has yet to adopt the new standards); (c) the revised NAAQS for particulate matter of aerodynamic diameter less than ten microns (PM_{10}); (d) ozone (O_3) (Nevada has yet to adopt the new and revised standards); and (e) a violation of a state standard occurs with the first annual exceedance of an ambient standard, while federal standards are generally not violated until the second annual exceedance. In addition to establishing the NSAAQSs, the BAPC is responsible for permit and enforcement activities throughout the State of Nevada.

The Project Area is located in White Pine County, Nevada. The regulatory authority for air quality within White Pine County is the BAPC. Before any construction of a potential source of air pollution can occur, an air quality permit must be obtained from the BAPC.

The BAPC permitting program implements the Title V federal operating permitting program, as well as the minor source permitting program for facilities that emit less than 100 tons per year of all criteria pollutants and are not a major source of HAP. BMM's current operations are regulated by three air quality operating permits. Operations at the BMM are permitted under BAPC's minor source permitting program via air quality operating permit AP1041-1362. The crushing circuit located at the BMM project area is permitted under permit AP1611-2227 for a temporary sand and gravel processing. The Mooney Basin project operations were permitted under a Class III air quality operating permit AP1041-1336.

BMM, in concert with the BAPC, the EPA, and three other mining companies participated in the Voluntary Mercury Reduction Program from 2001 to 2005. Using the data collected from that program, the BAPC implemented the Mercury Control Program (MCP) in March 2006. The MCP is designed to control mercury emissions from thermal units located at precious metal mines and mills. In the initial phase of the MCP, data on thermal units and their controls are being collected throughout Nevada. This will be followed by the development of Maximum Achievable Control Technology (MACT) standards for each type of thermal unit. The installation of MACT control devices will be the minimum requirement of the ensuing mercury permitting program under the MCP.

3. EXISTING CONDITIONS

3.1. Meteorological Setting

The Project Area is a high desert environment characterized by arid to semiarid conditions with bright sunshine, low annual precipitation, and large daily ranges in temperatures. The climate is controlled primarily by rugged and varied topography to the west, and specifically the Sierra Nevada Mountain Range. Prevailing westerly winds move warm, moist Pacific air over the western slopes of the Sierra Nevada Mountain Range where the air cools, condensation takes place, and most of the moisture falls as precipitation. As the air descends the eastern slopes of the Sierra Nevada Mountain Range, compressional warming takes place, resulting in minimal rainfall.

Meteorological information for the BMM was taken from data collected by the National Weather Service (NWS) at Elko, Nevada, (station KEKO-725825 - elevation 1548.4 meters) that is located 59 miles (95 kilometers) northwest of the Project Area (Figure 1.1). The meteorological data files were provided by the BAPC. Based on meteorological monitoring data collected from the NWS Elko station during 2005, the average temperature was 46.9 degrees Fahrenheit (°F), with temperatures ranging from 100°F to minus 6°F. Annual precipitation during the same period ranged from 0.33 to 1.10 inches.

Atmospheric dispersion is influenced by several parameters, including wind speed, temperature inversions (mixing heights), and atmospheric stability. Prevailing winds at the NWS Elko Station, based on the 2005 meteorological data, were from the southwest with average annual wind speeds at 8.3 miles per hour (mph). Month-to-month variations were small, with average wind speeds ranging from 3.2 to 6.7 mph. These wind speeds tend to promote atmospheric mixing, and generally transport locally generated air emissions away from the area.

Inversions restrict vertical movement of the air in the lower atmosphere, thereby preventing atmospheric pollutants from mixing with the air above the inversion layer. Efficient mixing is affected by seasonal and diurnal variations. In a regional pollution study, typical seasonal patterns in Winnemucca, Nevada, northwest of the Project Area and within the same climate zone, have fall and winter mixing heights ranging from 300 meters to 900 meters on average (USDA-FS 2003). The lower mixing heights during the winter pose less of a concern due to lower temperatures and night steered surface level winds that promote circulation and dispersal of pollutants. Average spring and summer mixing heights ranged between 1,800 meters and 2,400 meters. The high mixing heights can be attributed to inland continental warming in conjunction with diurnal patterns that promote air movement.

Atmospheric stability is expressed in terms of Pasquill-Gifford categories, which range from Class A (very unstable) to Class F (very stable). These categories describe the degree of atmospheric turbulence, which leads to atmospheric mixing and the dispersion of pollutants. The greater the atmospheric instability, the greater the tendency to disperse emitted air pollutants. Meteorological data from the NWS Elko station indicate that good dispersion conditions (Class A through Class D) occurred 74 percent of the time during the year 2005, and are believed to be representative of conditions at the Project Area.

3.2. Existing Air Quality

Air quality in the Project Area is governed by pollutant emissions and meteorological conditions. As discussed in Section 3.1, wind speeds, inversions, mixing heights, and stability all affect the circulation and dilution of pollutant emissions in the area.

The Project Area is located within four planning areas. The areas include Huntington Valley, Ruby Valley, Long Valley, and Newark Valley Planning Areas. All areas are currently unclassified or designated as attainment for all pollutants having a federal air quality standard (40 CFR 81.329). No NO_2 or lead nonattainment areas are located within the State of Nevada. Washoe County, Nevada, (within which the city of Reno is located) is the PM_{10}, and CO, O_3 nonattainment area located closest to the Project Area, although it is situated more than 100 miles (167 kilometers) to the northwest. With the reclassification of Steptoe Valley nonattainment area to attainment for SO_2, there are no SO_2 nonattainment areas located in Nevada. Washoe County was designated as a marginal O_3 nonattainment area for the one-hour standard. However, the EPA classified Washoe County as attainment for the eight-hour standard. The only eight-hour O_3 nonattainment area in Nevada is a portion of Clark County.

4. AIR QUALITY ASSESSMENT

4.1. Air Quality Assessment Methodology

Dispersion modeling is an accepted method of assessing potential impacts from proposed pollutant sources. The methods used in this air quality assessment are for a worst case scenario which includes impacts from the operations associated with the North Pit and Top/Sage Complex open pits, RDAs, heap leaching, and roads. Average operational times of one, three, eight, 24, and 8,760 hours, were utilized to appropriately demonstrate compliance with the NAAQSs and NSAAQSs.

4.1.1. Model Selection and Options

The EPA's designation of AERMOD as the preferred air dispersion model became effective on December 9, 2005. Therefore, AERMOD (version 07026) was selected for this analysis. The Trinity Consultants' BREEZE AERMOD v6.1.29 modeling manager was utilized to prepare the input files and manage the processing.

Dispersion models use mathematical equations to simulate the transport and diffusion of emitted pollutants within the atmosphere, and can calculate air pollutant concentrations at any discrete location. Air pollutant emissions may be from point sources (such as stacks or vents); volume sources (such as buildings or elevated conveyors); area sources (regions with a distinct square footage and little or no vertical velocity, such as a lagoon or heap); or open pit sources (below-grade operations such as an open pit mine). Non-reactive gasses, or particles such as PM_{10}, which behave like gases, emitted from these sources are modeled based on a Gaussian distribution, which is a relatively good mathematical approximation of plume behavior (Schulze 1991).

According to the Guideline on Air Quality Models (as revised) (40 CFR 51, Appendix W), the AERMOD Model is approved for use in calculating ambient air pollutant concentrations resulting from the emissions of sources such as those within the Project Area and with terrain similar to that found within and adjacent to the Project Area. The AERMOD model used in this analysis (version 07026) includes the Plume RIse Model Enhancement (PRIME) downwash algorithms that are used to calculate plume downwash from stack emission caused by wind flowing over and around nearby buildings.

The dispersion modeling used the EPA's regulatory default model options as outlined in Appendix A of the Guideline on Air Quality Models (as revised).

The following additional model options were used:

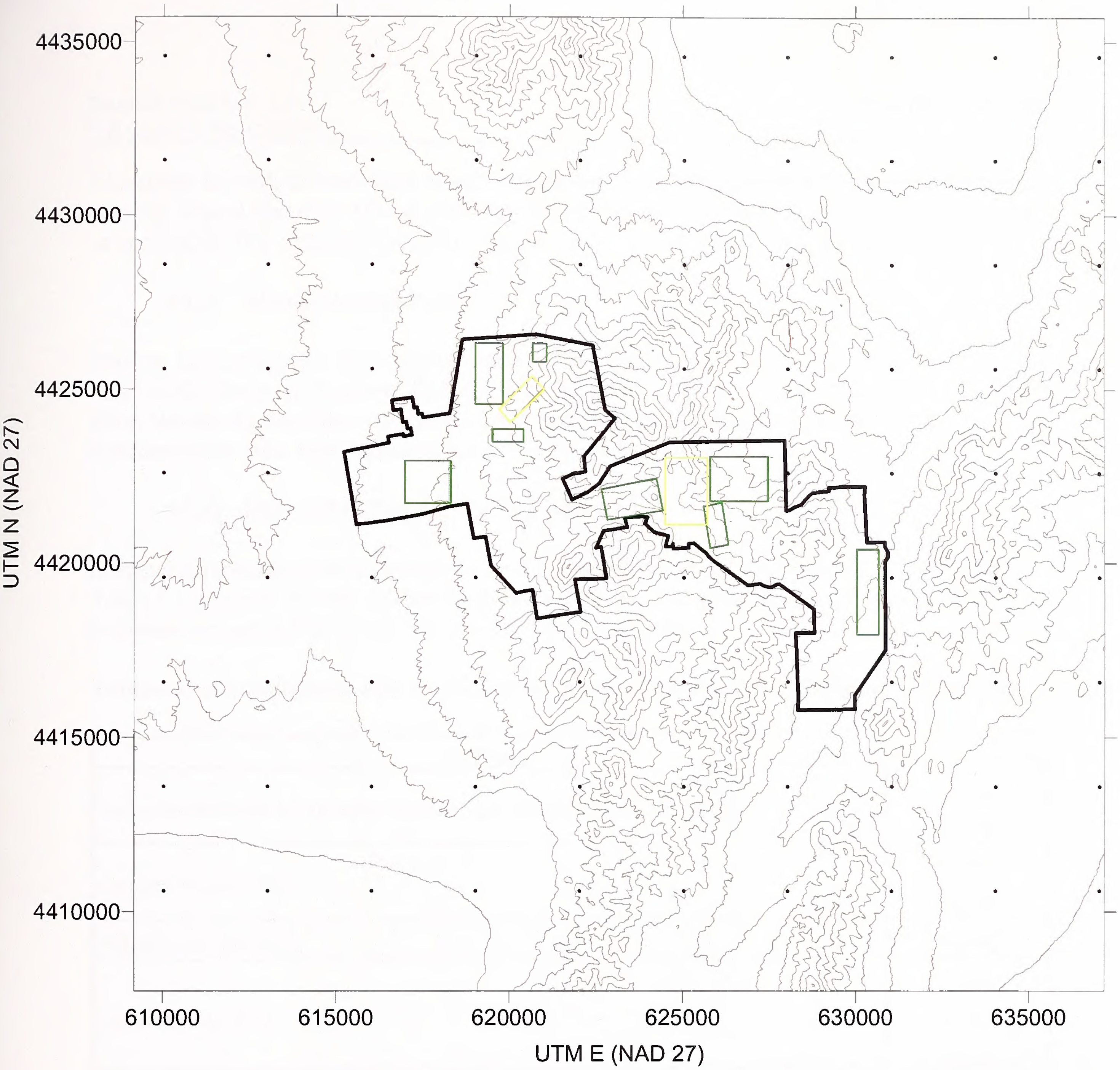
- Rural dispersion parameters; and
- Concentration values calculated for elevated terrain and surface-based receptors (no flagpole receptors).

4.1.2. Receptors

Three different classes of receptors were used in the final modeling. The first class was a discrete, "fenceline" receptor set, consisting of individual receptors placed at 100-meter intervals along the Plan boundary. The Plan boundary represents the Project Area not accessible to the public (generally fenced areas or where other features prevented public access). The second class of receptors consisted of receptor "grids," the size and spacing of which were designed to cover the entire Project Area and a larger area outside of the Project Area, which was potentially accessible to the public. A large Cartesian receptor grid was utilized, with receptors spaced at 3,000 meter intervals, extending out approximately 23 kilometers (km) to the north, 21 km to the east, 50 km to the south and 62 km to the east from all stationary sources. The receptor grid was approximately 102 km by 72 km with an additional rectangular extension to the northeast of 39 km by 12 km to capture additional receptors.

AERMOD requires preprocessing of the receptors through the AERMAP subprogram. AERMAP evaluates local topography in the vicinity of each receptor and assigns additional attributes to each one that allows AERMOD to better calculate terrain effects.

The third class of receptor was defined as a discrete receptor point used to assess the potential impact of the Project on the Ruby Lake National Wildlife Refuge, a specific sensitive receptor. For the purpose of this assessment, a receptor was chosen at the Gallagher State Fish Hatchery, as an area in close proximity that is frequently visited by the public and has nearby residences. The elevation for the receptor was obtained from the appropriate 30-meter DEMs represented by a single modeling point.



EXPLANATION
Green Rectangles are Area Sources,
Tan Rectangles are Open Pit Sources, and
Volume are Red.
Black Points Represent Receptors.

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Date: 2/07/08
Reviewed By: AMD, RFD

Modeled Sources

Figure 4.1

Elevations for each of these three classes of receptors were taken from the U.S. Geological Survey (USGS) Digital Elevation Model (30-meter DEM) data for 7.5 minute series (topographic) maps, as applicable. The complete list of DEM quadrangles utilized can be found in Appendix C.

4.1.3. Meteorological Data

Surface meteorological data representative of the Project Area is a required input dataset for AERMOD. One year (January 2005 through December 2005) of processed met data collected in Elko, Nevada, by the NWS was chosen because of its high quality and surface station location. The meteorological data was recommended and provided by the BAPC.

4.1.4. Modeled Pollutants and Assumptions

Dispersion modeling was conducted for four of the criteria air pollutants PM_{10}, CO, NO_2, and SO_2. Table 4.1 presents all four pollutants, for all applicable averaging times, and for a total of eight pollutant-averaging time combinations that were considered.

Table 4.1: Air Pollutants and Applicable Averaging Times for the Air Quality Modeling

Pollutant	Averaging Time
Particulate Matter of Aerodynamic Diameter less than 10 Micrometers (PM_{10})	24-Hour Annual
Carbon Monoxide (CO)	1-Hour 8-Hour
Nitrogen Dioxide (NO_2)	Annual
Sulfur Dioxide (SO_2)	3-Hour 24-Hour Annual

Dispersion modeling was actually performed for oxides of nitrogen (NOx), rather than nitrogen dioxide (NO_2), the pollutant for which ambient standards have been adopted. In general, NOx consists of NO_2 and other oxides of nitrogen; thus, an assessment using NOx results is a conservative assessment which tends to over predict the anticipated ambient concentrations of NO_2 resulting from the facility.

A screening model was employed for O_3 (ozone). The Scheffe screening model (Scheffe 1988) was used to evaluate the Facility's potential to contribute to low-level O_3 concentrations, and to demonstrate compliance with the one-hour O_3 standard. The Facility does not directly produce O_3. O_3 is produced by photo-chemical reactions involving certain volatile organic compounds (VOCs) and NOx. The emission of these compounds can be calculated and used in the Scheffe screening model to evaluate potential O_3 generation.

Modeling was not performed for the criteria pollutants $PM_{2.5}$, lead (Pb), or O_3 (for the eight-hour standard). Lead emissions from the Project are considered to be negligible; therefore, no analyses were performed with respect to Pb. At the time of the preparation of this Report, BAPC has not implemented the $PM_{2.5}$ standard or the eight-hour O_3 standard. Only the one-hour O_3 standard was considered.

4.1.5. Background Concentrations

To assess the impact of the Project on the ambient air quality, it was necessary to also account for existing, or background, levels for each pollutant. BAPC guidance (http://ndep.nv.gov/bapc/qa/model.html) recommends using appropriate annual average PM_{10} concentrations as a suitable background value to approximate pre-existing PM_{10} concentrations. No monitoring station is located in close proximity to the BMM; therefore, PM_{10} emissions concentrations consistent with BAPC guidance for facilities in rural settings is utilized. A background concentration of 10.2 $\mu g/m^3$ was added to the 24-hour PM_{10} model results, and 9.0 $\mu g/m^3$ was added to the modeled annual PM_{10} emissions.

In addition, no monitoring has been performed in proximity to the BMM for ambient concentrations of CO, NO_2, O_3, or SO_2, nor does the BAPC specify background concentrations for these pollutants. However, background values are used for the purpose of NEPA analysis. Most air pollutant monitoring is undertaken in locations with relatively high population density where high pollutant levels might be expected. Almost all of the monitoring conducted by the State of Nevada is done in the Reno/Carson City or Las Vegas areas. Monitoring data from throughout the United States is available at the EPA Air Data web site (http://www.epa.gov/air/data/index.html). Monitoring data from most of the western states were reviewed, and the most suitable surrogates considered for each pollutant. Not all monitoring sites monitor all of the criteria pollutants. Table 4.2 lists the pollutant, timeframe, monitor location, years of data reviewed, and assumed background value based on the first-high value from the years reviewed. The first-high value from the monitoring data was used rather than the second-high value because the state of Nevada uses the more stringent first-high value to determine compliance with the ambient standards (see Table 2.1, footnote b).

Trona, California was chosen for background values for SO_2 and NO_2. Trona is a small desert town in southern California. Unfortunately, the monitoring at Trona does not include CO. Barstow, California, was chosen for CO, although this southern California town is located at the junction of two interstates and is a major railroad center. Monitored combustion emissions would be expected to be higher in Barstow than in Crescent Valley. All O_3 monitoring in southern California record very high ozone values. These values probably reflect local combustion sources, down-wind transport of pollutants from the Los Angeles basin, and persistent warm, sunny weather ideal for the creation of ozone. Craters of the Moon National Monument in Idaho was chosen for the background value for the one-hour O_3 standard. The monument is remote, and in a sagebrush dominated landscape similar to Crescent Valley.

Table 4.2: Background Values for Criteria Pollutants.

Pollutant and Averaging Time	Monitor Location	Years of Data Reviewed	Standard ($\mu g/m^3$)	Background Value ($\mu g/m^3$)
PM_{10} 24-Hour	*BAPC Default Value*	N/A	150	9.0
PM_{10} Annual	*BAPC Default Value*	N/A	50	10.2
CO One-Hour	Barstow, CA	2002-2005	10,000	3,771
CO Eight-Hour	Barstow, CA	2002-2005	10,000	1,666
NO_2 Annual	Trona, CA	2002-2005	100	9.43
SO_2 Three-Hour	Trona, CA	2002-2005	1,300	28.6
SO_2 24-Hour	Trona, CA	2002-2005	365	18.3
SO_2 Annual	Trona, CA	2002-2005	80	5.3
O_3 One-Hour	Craters of the Moon Nat'l Monument	2002-2005	235	141

4.2. Air Pollution Emission Sources and Emission Inventory

The existing facilities and the Project contain numerous sources of air pollutants. In order to analyze the impacts of the Proposed Action, assumptions had to be made in many different areas, including facility configuration, future haul road locations, and the quantities of material processed and/or handled at certain locations (such as how much material is transported per day to the BMM 2/3 leach pad, how much is transported to the RDAs, etc.). This report has quantified the emissions of the applicable criteria pollutants from the Proposed Action directly related to the processing of ore from the Project. Air emission estimates were made based on the following factors: 1) maximum material throughput; 2) EPA-approved emission factors obtained from EPA's "Compilation of Air Pollution Emission Factors" (5th edition), otherwise known as EPA AP-42; 3) existing air quality permits and past air quality permit applications for both the Bald Mountain Mine project and the Mooney Basin; 4) facility descriptions (PDI 2006); and 5) information provided by BMM. A comprehensive list of identified individual potential sources of Project air pollutant emissions (emission units), organized into "emission groups" of similar activities (such as in-pit handling, heap leaching, etc.), are presented in Appendix A. In all, 113 activities and sources were considered for their pollutant emission potential. Appendix B contains the emission inventory of the Proposed Action for the 24-hour modeling period. Emission inventories for other periods are provided on CD in Appendix C.

Calculated air pollution emissions from the Proposed Action were based on the Project's daily maximum mining rate of 95,000 tpd in the BMM North pit for most pollutants. Emissions from processing ore at the Top/Sage pit are based on the proposed daily average processing rate of 125,000 tpd.

4.3. Air Quality Dispersion Modeling Analysis

4.3.1. Ambient Air Quality Standard Modeling

For the purpose of modeling the fugitive and combustion emissions from haul road traffic, the road network was divided into segments (Figure 1.3). The segments were determined by stretches of haul road with similar traffic loads. The usage of each of the segments differs by the various combinations of modeled haulage routes, based on different origins and destinations of the ore and waste. Appendices B and C contain general road segment data showing which segments were used by the different ore and waste haulage routes.

The modeled road segments that begin or end on rock disposal areas, leach pads, or in the open pit are modeled to approximately the center of these features. In order to model each of the roads effectively, some of these individual emission sources are modeled as part of the open pit model source, and others are modeled as part of the respective haul end-points (RDAs or leach pads).

Model emission rates for each of the individual model sources were calculated using the emission estimates presented in Appendix C. The dispersion model calculates ambient concentrations for each hour of the modeled time period, and thus appropriate hourly emission rates must be calculated for each modeled source for each modeled time period. For all sources that operate (or are assumed to operate) at a flat rate for the modeled time period, the appropriate hourly emission rate is the flat rate. However, the emission rate for any modeled source, which operates intermittently over the modeled time period must be "scaled" to avoid an inappropriate over estimation of the modeled ambient concentrations. Scaling allocates the total of all of the emissions from a source during the modeled time period (i.e., eight-hour, 24-hour, annual, etc.) equally over all of the hours in the modeled time period. For example, the BMM process facility emergency generators' maximum hourly NO_2 emissions are estimated to be 19.4 lbs/hour. The annual NO_2 emissions are limited by the air quality permit to operate a maximum of 500 hours per year. The scaled hourly emission rate can then be calculated by multiplying by the number of operating hours during the modeled time period and dividing by the number of total hours during the modeled time period:

$$\left(19.4\ \frac{lbs}{hr}\right)\left(\frac{\frac{500\ hours}{year}}{\frac{8{,}760\ hours}{year}}\right) = 1.11\ \frac{lbs}{hr} \quad \text{(Scaled Hourly } PM_{10} \text{ Emission Rate)}$$

Finally, the scaled hourly emission rate is converted from pounds per hour to grams per second for use in the model:

$$\left(1.11\ \frac{lbs}{hr}\right)\left(\frac{1\ hour}{3{,}600\ seconds}\right)\left(\frac{453.6\ grams}{1\ pound}\right) = 1.40 \times 10^{-1}\ \frac{g}{s} \quad \text{(Modeled Emission Rate)}$$

The above methodology was used to calculate modeled emission rates for all sources for each of the model averaging times.

The dispersion modeling assumed an operational and facility configuration that simulated a realistic operational maximum scenario. In addition to the assumptions made to calculate the applicable emission rates (i.e., the BMM North pit was in full production of 95,000 tons mined per day), the heap leach pads and rock disposal areas were assumed to be built to their full proposed heights, the open pits were assumed to be at their full depth, which results in the maximum potential emissions from the haul trucks.

Emissions from those emission units located within one of the large area/open pit sources (leach pads, RDAs, and open pit mines) were combined with the larger emission source for the modeling. For example, emissions from dozers and haul trucks operating on the Mooney heap leach pad, as well as the haul road emissions on the leach pad, were added to the Mooney heap leach pad fugitive emissions to represent the total emissions from the Mooney heap leach pad.

The open pit source was used to model fugitive emissions from the activities in the two open pit mines included in the model. This source can only be used for particulate emissions. An area source was used to model gaseous emissions from vehicle operations and blasting in the open pit mines.

Model runs were conducted as follows for the Proposed Action. One separate model run was conducted for each combination of pollutant for the Proposed Action for appropriate averaging periods. One separate model run based upon four averaging periods of annual, 24-hour, one and 8-hour (CO only) and a three-hour (SO_2 only) was conducted for the Plan Boundary receptors and sensitive receptor at Gallagher State Fish Hatchery. Each model run calculated pollutant concentrations from a single source group consisting of all of the appropriate emission units. All emission parameters for each of the emission units were modeled as presented in the spreadsheets provided in Appendices B and C.

The Scheffe Screening model inputs and results can be found in Appendix C. The results cannot be applied to specific geographic locations, so the O_3 impacts are not considered for the Sensitive Receptors.

The results of the dispersion modeling for the Proposed Action are presented in Tables 4.3 for the modeled concentrations and the modeled concentration plus the background concentration. The tables shows the highest modeled results at any point of public access for all eight pollutant-averaging time combinations, the location (in UTM NAD 27 coordinates) of the highest modeled public access receptor, and the lowest applicable standard (NSAAQS or NAAQS) for each of the eight pollutant-averaging time combinations. Table 4.3 demonstrates that for all pollutant-averaging time combinations, the Proposed Action modeled ambient concentrations are below the applicable ambient standards and will not cause or contribute to a violation of a NSAAQS or NAAQS for PM_{10}, SO_2, CO, NO_2, or O_3 even with the addition of background concentrations.

Table 4.3: Highest Modeled Air Pollutant Concentrations from the Proposed Action

Pollutant	Averaging Time	Highest Modeled Receptor Point			Lowest Applicable Ambient Standard (μg/m³)
		Receptor Location[1]		Dispersion Modeling Results (μg/m³)[2]	
		UTM East (m)	UTM North (m)		
Particulate Matter of Aerodynamic diameter less than 10 micrometers (PM_{10})	24-Hour	630,964	4,420,316	79.6	150
	Annual	630,964	4,420,266	16.1	50
Sulfur Dioxide (SO_2)	3-Hour	630,886	4,418,190	487.9	1,300
	24-Hour	630,885	4,418,340	116.14	365
	Annual	623,571	4,421,339	8.47	80
Carbon Monoxide (CO)	1-Hour	620,362	4,426,563	7,966	40,000
	8-Hour (< 5,000')	626,482	4,423,522	5,255	10,000
	8-Hour (≥ 5,000')	626,482	4,423,522	5,255	6,667
Ozone (O_3)	1-Hour	-	-	197	235
Nitrogen Dioxide (NO_2)	Annual	623,571	4,421,339	77.3	100

[1] All coordinates in UTM projection, North American Datum 1927.
[2] Background values, as listed in Table 4.2 are included.

4.3.2. Plan Boundary Modeling

Model runs were conducted for the four averaging periods of annual, 24-hour, one and 8-hour (CO only) and a three-hour (SO_2 only) for the defined Plan Boundary receptors as discussed in Section 4.1.2. Each model run calculated pollutant concentrations from the source groups consisting of all of the appropriate emission units. The modeling results for the plan boundary receptors for the Proposed Action are presented in Table 4.4.The modeled concentrations in Table 4.4 do not include any background values.

The highest modeled 24-hour PM_{10} concentration from the Project emissions on the defined Plan Boundary receptor was 70.59 μg/m³. The highest annual PM_{10} concentration from the Project emissions on the sensitive receptor was 5.90 μg/m³.

Table 4.4: Highest Modeled Air Pollutant Concentration Impacts from the Proposed Action at the Defined Plan Boundary Receptors

Pollutant	Averaging Time	Highest Modeled Receptor Point			Lowest Applicable Ambient Standard ($\mu g/m^3$)
		Plan Boundary Receptor Location[1]		Dispersion Modeling Results ($\mu g/m^3$)	
		UTM East (m)	UTM North (m)		
Particulate Matter of Aerodynamic diameter less than 10 micrometers (PM_{10})	24-Hour	630,964	4,420,316	70.59	150
	Annual	630,964	4,420,266	5.90	50
Sulfur Dioxide (SO_2)	3-Hour	630,886	4,418,190	459.28	1,300
	24-Hour	630,885	4,418,340	97.84	365
	Annual	623,571	4,421,339	3.17	80
Carbon Monoxide (CO)	1-Hour	620,363	4,426,563	7,825	40,000
	8-Hour (< 5,000')	626,481	4,423,522	3,589	10,000
	8-Hour (≥ 5,000')	626,481	4,423,522	3,589	6,667
Ozone (O_3)	1-Hour	-	-	197	235
Nitrogen Dioxide (NO_2)	Annual	623,571	4,421,339	67.9	100

[1] All coordinates in UTM projection, North American Datum 1927.

4.3.3. Sensitive Receptor Modeling

As discussed in Section 4.1.2, an assessment was also made to estimate the potential impact of the Proposed Action on the selected sensitive receptor within the Ruby National Wildlife Refuge at the Gallagher State Fish Hatchery. Separate model runs were made for each of the averaging time periods with the eight pollutant combinations using only the defined sensitive receptors and the same dispersion modeling inputs used for the modeling previously discussed. The results of the modeling for the sensitive receptor for the Proposed Action are presented in Table 4.5. The modeled concentrations in Table 4.5 do not include any background values.

The highest modeled 24-hour PM_{10} concentration from the Project emissions on the defined sensitive receptor was 1.88 $\mu g/m^3$. The highest annual PM_{10} concentration from the Project emissions on the sensitive receptor was 0.048 $\mu g/m^3$.

Table 4.5: Highest Modeled Air Pollutant Concentration Impacts from the Proposed Action at the Defined Sensitive Receptor.

Pollutant	Averaging Time	Highest Modeled Concentration Gallagher State Fish Hatchery	Lowest Applicable Ambient Standard
Particulate Matter of Aerodynamic Diameter of less than 10 Micrometers (PM_{10})	24-Hour	1.88	150 μg/m^3
	Annual	0.048	50 μg/m^3
Carbon Monoxide (CO)	1-Hour	486.92	40,000 μg/m^3
	8-Hour (< 5,000')	128.71	10,000 μg/m^3
	8-Hour (≥ 5,000')	128.71	6,667 μg/m^3
Nitrogen Dioxide (NO_2)	Annual	0.491	100 μg/m^3
Sulfur Dioxide (SO_2)	3-Hour	2.60	1,300 μg/m^3
	24-Hour	0.346	365 μg/m^3
	Annual	0.023	80 μg/m^3

Modeling was also performed to determine the concentrations of the gaseous pollutant emissions (SO_2, CO, and NO_2) from the Proposed Action on the defined sensitive receptors. The highest modeled concentration for each modeled air pollutant at the sensitive receptor for each applicable averaging time is also presented in Table 4.5. In all instances, the modeled concentrations are less than the applicable ambient air quality standard(s). Thus, further analyses for these pollutants are not warranted.

5. REFERENCES

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APPENDIX A

List of Sources Analyzed for the North Operations Area

Barrick Gold U.S., Inc. Bald Mountain Mine Amendment to PoO
North Operations Area: Bald Mountain/Mooney Basin
White Pine County, Nevada

Air Pollution Emission Inventory

Master List of All Modeled Sources and Pollutants

Emission Unit No.	Emission Unit Description	Pollutants
	Emission Unit Group 1: In- Pit Handling	
1.001	Drilling - Ore	PM_{10}
1.002	Drilling - Waste	PM_{10}
1.003	Ammonium Nitrate Prill Silo Loading	PM_{10}
1.004	Ammonium Nitrate Prill Silo Unloading	PM_{10}
1.005	Blasting - Ore	PM_{10}
1.006	Blasting -Waste	PM_{10}
1.007	Explosive Detonation - Ore Blasting	CO, SO_2, NOx
1.008	Explosive Detonation - Waste Blasting	CO, SO_2, NOx
1.009	Loading - Ore	PM_{10}
1.010	Loading - Waste	PM_{10}
1.011	Loaders (Pit) - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
1.012	Hydraulic Shovel - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
1.013	Rotary Drills - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
1.014	Motor Grader - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
1.015	Blasting Trucks - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
1.016	Excavator- ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
1.017	Water Trucks - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
1.018	Water Trucks - Fugitive Emissions	PM_{10}
	Emission Unit Group 2: Ore Handling	
2.001	Hauling of Ore - North Pit to BMM 2/3 Heap Leach Pad	PM_{10}
2.002	Hauling of Ore - Top/Sage Pit to BMM 2/3 Heap Leach Pad	PM_{10}
2.003	Hauling of Ore- Top/ Sage Pit to Mooney Heap Leach Pad	PM_{10}
2.004	Hauling of Ore - North Pit to BMM 2/3 Heap Leach Pad- ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
2.005	Hauling of Ore - Top/Sage Pit to BMM 2/3 Heap Leach Pad- ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
2.006	Hauling of Ore- Top/ Sage Pit to Mooney Heap Leach Pad- ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx

Emission Unit Group 3: Waste Handling		
3.001	Hauling of Waste to Sage Flat RDA	PM_{10}
3.002	Hauling of Waste to East Sage RDA	PM_{10}
3.003	Hauling of Waste to South Water Canyon RDA	PM_{10}
3.004	Hauling of Waste to North 1RDA	PM_{10}
3.005	Hauling of Waste to North 2 RDA	PM_{10}
3.006	Hauling of Waste to North 5 RDA	PM_{10}
3.007	Hauling of Waste to Sage Flat RDA - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
3.008	Hauling of Waste to East Sage RDA -***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
3.009	Hauling of Waste to South Water Canyon RDA - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
3.010	Hauling of Waste to North 1RDA - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
3.011	Hauling of Waste to North 2 RDA - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
3.012	Hauling of Waste to North 5 RDA - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
3.013	Wind Erosion- RDAs	
3.014	Waste Unloading	PM_{10}
3.015	Waste Dozing	PM_{10}
3.016	Waste Dozing - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
Emission Unit Group 4: Heap Leaching		
4.001	Unloading Ore - BMM 2/3 Leach Pad	PM_{10}
4.002	Unloading Ore - Mooney Leach Pad	PM_{10}
4.003	Ore Dozing - BMM 2/3 Leach Pad	PM_{10}
4.004	Ore Dozing - Mooney Leach Pad	PM_{10}
4.005	Ore Dozing (BMM 2/3 Leach Pad)- ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
4.006	Ore Dozing (Mooney Leach Pad)- ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
4.007	Wind Erosion - BMM 2/3 Leach Pad	PM_{10}
4.008	Wind Erosion - Mooney Leach Pad	PM_{10}
Emission Unit Group 5: Refinery		
5.001	Carbon Reactivation Kiln (North)- Carbon throughput	PM_{10}
5.002	Carbon Reactivation Kiln (Mooney)- Carbon throughput	PM_{10}
5.003	Mercury Retort (North)- Throughput	Hg
5.004	Mercury Retort (Mooney)- Throughput	Hg
5.005	Bullion Furnance (North)- Throughput	PM_{10}
5.006	Bullion Furnance (North)- Combustion 0.85MMBtu	CO, PM_{10}, VOCs, SO_2, NOx
5.007	Bullion Furnance (Mooney)- Throughput	PM_{10}
5.008	Bullion Furnance (Mooney)- Combustion 0.85MMBtu	CO, PM_{10}, VOCs, SO_2, NOx

Emission Unit Group 6: Storage Tanks (Diesel, Propane, Gasoline, Ethylene Glycol)		
6.001	Diesel Fuel Tank 1- 5140 Gal	VOCs
6.002	Diesel Fuel Tank 2- 2500 Gal	VOCs
6.003	Diesel Fuel Tank 3- 5240 Gal	VOCs
6.004	Diesel Fuel Tank 4- 1300 Gal	VOCs
6.005	Gasoline Tank- 2900 Gal	VOCs
6.006	Methanol Tank- 4940 Gal	VOCs
6.007	Waste Antifreeze Tank- 1500 Gal	VOCs
Emission Unit Group 7: Standby Generators		
7.001	#888-810 HP Generator 1(BMM process facility)	CO, PM_{10}, VOCs, SO_2, NOx
7.002	#888-810 HPGenerator 2 (Mooney process facility)	CO, PM_{10}, VOCs, SO_2, NOx
7.003	Generator 3 (Admin building)	CO, PM_{10}, VOCs, SO_2, NOx
7.004	Generator 4 (truck shop)	CO, PM_{10}, VOCs, SO_2, NOx
7.005	Generator 5 (truck shop)	CO, PM_{10}, VOCs, SO_2, NOx
Emission Unit Group 8: Portable Crushing System		
8.001	Loader (Crusher) - ***Combustion***	CO, PM_{10}, VOCs, SO_2, NOx
8.002	Loader Transfer to Grizzly Feeder	PM_{10}
8.003	Grizzly Feeder transfer to Jaw Crusher	PM_{10}
8.004	Jaw Crusher	PM_{10}
8.005	Jaw Crusher transfer to Underjaw Conveyor	PM_{10}
8.006	Underjaw conveyor transfer to Primary Screen Feed Conveyor	PM_{10}
8.007	Primary Screen Feed Conveyor transfer to Primary Screen	PM_{10}
8.008	Primary Screen	PM_{10}
8.009	Primary Screen transfer to Under Screen Belt #1	PM_{10}
8.010	Primary Screen transfer to Stowe Cross Belt #1	PM_{10}
8.011	Under Screen Belt #1 transfer to Transfer Conv #1	PM_{10}
8.012	Transfer Conveyor #1 transfer to Reject Sand Stacker	PM_{10}
8.013	Reject Sand Stacker transfer to Reject Stockpile	PM_{10}
8.014	Stowe Cross Belt #1 transfer to Finish Screen Feed Belt	PM_{10}
8.015	Return Belt transfer to Finish Screen Feed Belt	PM_{10}
8.016	Finish Screen Feed Belt transfer to Screen #2	PM_{10}
8.017	Finish Screen #2	PM_{10}
8.018	Screen #2 transfer to Under Screen Belt #2	PM_{10}
8.019	Screen #2 transfer to Stowe Cross Belt #1	PM_{10}
8.020	Stowe Cross Belt #1 transfer to Cone Feed Conveyor	PM_{10}
8.021	Cone Feed Conveyor transfer to Cedar Rapids Cone	PM_{10}
8.022	Cedar Rapids Cone	PM_{10}
8.023	Cedar Rapids Cone transfer to Cone Return Belt	PM_{10}
8.024	UnderScreen Belt #2 transfer to Type II Transfer Belt	PM_{10}
8.025	Type II Transfer Belt transfer to Product Stacker	PM_{10}
8.026	Product Stacker transfer to Finish Stockpile	PM_{10}
8.027	Wind Erosion- Finish Stockpile	PM_{10}

Emission Unit Group 9: Other Sources		
9.001	Waste oil heater (250,000Btu)	CO, PM_{10}, VOCs, SO_2, NOx
9.002	Heap leach lime silo loading	PM_{10}
9.003	Heap leach lime silo discharge to lime conveyor	PM_{10}
9.004	Heap leach lime conveyor transfer to dosing hopper	PM_{10}
9.005	Dosing Hopper transfer to truck	PM_{10}
9.006	Propane Refinery Boiler (2.5 million Btu)	CO, PM_{10}, VOCs, SO_2, NOx
9.007	Light Plant #1	CO, PM_{10}, VOCs, SO_2, NOx
9.008	Light Plant #2	CO, PM_{10}, VOCs, SO_2, NOx
9.009	Light Plant #3	CO, PM_{10}, VOCs, SO_2, NOx
9.010	Light Plant #4	CO, PM_{10}, VOCs, SO_2, NOx
9.011	Light Plant #5	CO, PM_{10}, VOCs, SO_2, NOx
9.012	Light Plant #6	CO, PM_{10}, VOCs, SO_2, NOx
9.013	Light Plant #7	CO, PM_{10}, VOCs, SO_2, NOx
9.014	Light Plant #8	CO, PM_{10}, VOCs, SO_2, NOx
9.015	Light Plant #9	CO, PM_{10}, VOCs, SO_2, NOx
9.016	Light Plant #10	CO, PM_{10}, VOCs, SO_2, NOx
9.017	Light Plant #11	CO, PM_{10}, VOCs, SO_2, NOx
9.018	Light Plant #12	CO, PM_{10}, VOCs, SO_2, NOx

APPENDIX B

24-Hour Emission Inventory for the Proposed Action

Barrick Gold U.S., Inc- Bald Mountain Mine Amendment to PoO				
North Operations Area: Bald Mountain/ Mooney Basin				
Air Pollutant Emission Inventory - Daily (24-Hr) Operation				
Project Information				
	General Mine Data	Value	Units	Source
	Material moisture content (M) - Ore	4.0	%	BMM
	Material moisture content (M) - Waste Rock	3.5	%	BMM
	Material moisture content (M) - Lime	3.0	%	BMM
	Surfaca material moisture content (M) - Roads	10.0	%	Enviroscientists Estimate
	Material silt content (s) - Ore	4.0	%	BMM
	Material silt content (s) - Waste Rock	4.0	%	BMM
	Material silt content (s) - Lime	5.0	%	BMM
	Silt content of road surface material (s) - Project Roads	7.0	%	BMM
	Vehicle Speed in Pits, Dumps, and Leach Areas	8	mph	BMM
	Average Speed of Haul Trucks	12	mph	BMM
	Sulfur Content of Gas Burned (S) - LPG	1.0	gr/100 ft^3 (gas vapor)	Enviroscientists Estimate
	North Pits Mine Data			
	Mined Material - North Pits	95,000	tons/day	
	Mined Material - North Pits	95,000	tons/time	Calc - Material Mined * Modeling Period/hours/day
	Waste to Ora Ratio	5	1	BMM
	Blast holes drilled	175	day	BMM
	Mined Ore	19,000	tons/time	Calc. - Percentage Ore * Material Mined
	Percentage Ore	20.0%		BMM
	Mined Waste	76,000	tons/time	Calc. - Percentage Waste * Material Mined
	Parcentage Waste	80.0%		BMM
	Average Ore per Blast	18,000	tons	BMM
	Average Waste per Blast	75,000	tons	BMM
	Ore Haul Truck Load Size	240	tons/load	BMM
	Loads of Ore/Unit Time	79.17	loads/time	Calc. - Mined Ore / tons/load
	Waste Rock Haul Truck Load Size	240	tons/load	BMM
	Loads of Waste Rock/Unit Time	316.67	loads/time	Calc. - Mined Waste / tons/load
	Percentage of North Pits Ore to BMM 2/3 Leach Pad	100.00	%	BMM
	Parcentage of North Pits Ore to Moonay Leach Pad	80.00	%	BMM
	Size of North 1RDA	808	acres	Enviroscientists Estimate
	Size of North 2 RDA	90	acres	Enviroscientists Estimate
	Size of North 5 RDA	141	acres	Enviroscientists Estimate
	Active Portion, North 1 RDA	35	acres	BMM
	Active Portion, North 2 RDA	10	acres	BMM
	Active Portion, North 3 RDA	10	acres	BMM
	Active Portion, North 4 RDA	5	acres	BMM
	Active Portion, North 5 RDA	10	acres	BMM
	Maximum Size of Non-reclaimed Surface Area of RDAs	220	acres	BMM
	Size of BMM 2/3 Heap Leach Facility	350	acres	BMM
	Size of Mooney Heap Leach Facility	410		BMM
	Heap Leach Facilities - Max. Acres Under Leach	10	acres	BMM
	Heap Leach Facilities - Max. Acres Fresh Ore	15	acres	BMM
	Average Usage of Ammonium Nitrate	40,000	lbs / day	BMM
	Average Usage of Ammonium Nitrate	40,000	lbs / time	Calculated
	North Pits Operational Hours	355	days/yr	BMM
	North Pits Operational Hours	18	hrs/day	BMM

	Top/ Sage Mine Data			
	Mined Material - Top/ Sage	125,000	tons/day	BMM
	Mined Material - Top/Sage	125,000	tons/time	Calc - Material Mined * Modeling Period/hours/day
	Waste to Ore Ratio	7	1	BMM
	Blast holes drilled	230	day	BMM
	Mined Ore	18,750	tons/time	Calc. - Percentage Ore * Material Mined
	Percentage Ore	15.0%		BMM
	Mined Waste	106,250	tons/time	Calc. - Percentage Waste * Material Mined
	Percentage Waste	85.0%		BMM
	Average Ore per Blast	10,000	tons	BMM
	Average Waste per Blast	107,000	tons	BMM
	Ore Haul Truck Load Size	240	tons/load	BMM
	Loads of Ore/Unit Time	78	loads/time	Calc. - Mined Ore / tons/load
	Waste Rock Haul Truck Load Size	240	tons/load	BMM
	Loads of Waste Rock/Unit Time	443	loads/time	Calc. - Mined Waste / tons/load
	Percentage of Top/Sage Ore to BMM 2/3 leach pad	20	%	BMM
	Percentage of Top/Sage Ore to Mooney leach pad	80	%	BMM
	Size of South Water Canyon RDA	63	acres	Enviroscientists Estimate
	Size of East Sage RDA	839	acres	Enviroscientists Estimate
	Size of Sage RDA	259	acres	Enviroscientists Estimate
	Active Portion, South Water Canyon RDA	25	acres	BMM
	Actvie Portion, East Sage RDA	60	acres	BMM
	Active Portion, Sage RDA	25	acres	BMM
	Maximum Size of Non-reclaimed Surface Area of RDAs	290	acres	BMM
	Size of BMM 2/3 Heap Leach Facility	350	acres	BMM
	Size of Mooney Heap Leach Facility	410		BMM
	Heap Leach Facilities - Max. Acres Under Leach	12	acres	BMM
	Heap Leach Facilities - Max. Acres Fresh Ore	15	acres	BMM
	Average Usage of Ammonium Nitrate	40,000	lbs / day	BMM
	Average Usage of Ammonium Nitrate	33,333	lbs / time	Calculated
	Top/ Sage Operational Hours	355	days/yr	BMM
	Top/ Sage Operational Hours	20	hrs/day	BMM
General Information				
	Factor	**Value**	**Units**	**Source**
	Mean wind speed (U) inside pit	4.13	MPH	Calc. from Met Data (1/2 of surface value)
	Mean wind speed (U)	8.25	MPH	Calc. from Elko 2005 Met Data
	% of time Avg. windspeed greater than 5.4 m/s (f)	9.85	%	Calc. from Elko Met Data, 2005 hourly averages
	Number of days per year with precipitation >0.01 inches	62.00	Days/year	Calc. from Elko 2005 Met Data
	Sulfur Content of fuel Burned (S) - Diesel	0.05	%	EPA Limits S content to 500 ppm starting (6/2007)
	Diesel Fuel Heating Value	0.133936	mmBTU/gal	AP-42
	Fuel Oil No. 2 Heating Value	0.140000	mmBTU/gal	AP-42
	Propane Heating Value	0.090500	mmBTU/gal	AP-42
	Days/Unit Time	1	days/time	BMM
	Hours/Unit Time	24	hours/time	BMM

	Placer Dome U.S. Bald Mountain Mine Amendment to PoO			
	North Operations Area: Bald Mountain/Mooney Basin			
Air Pollutant Emission Inventory - Daily (24-Hr) Operation				
Emission Unit Specific Information				
	Factor	**Value**	**Units**	**Source**
Emission Unit Group 1: In-Pit Handling				
1.001	***Drilling - Ore***			
	Total Average Number of Holes Drilled per time	175	holes/time	BMM
	Percentage Ore in Blasted Material	20	%	Project Information
	Holes Drilled/Unit Time	35	holes/time	Calc. - holes/time * Percentage Ore
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.002	***Drilling - Waste***			
	Total Average Number of Holes Drilled per Day	175	holes/time	BMM
	Percentage Wasta in Blasted Material	80	%	Project Information
	Holes Drilled/Unit Time	140	holes/time	Calc. - holes/time * Percentage Waste
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.003	***Ammonium Nitrate Prill Silo Loading***			
	Tons/Delivery	20	tons/delivery	BMM
	Delivaries/Unit Time	1	deliveries/time	
	Tons/Unit Time	20.0	tons/time	Calc. - tons/delivery * delivery/time
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.004	***Ammonlum Nitrate Prill Silo Unloading***			
	Pounds Used/Hole	229	lbs/hole	Calc. Ammonium Nitrate used/holes drilled
	Tons Used/Unit Time	20.0	tons/time	Calc. - holes drilled per day * lbs/hole / 2,000
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.005	***Blasting - Ore***			
	Horizontal Area of Blast (A)	90,000	sq.ft.	BMM
	Drilled Holes/Blast	225	holes/blast	BMM
	Blasts/Unit Time	0.20	blasts/time	Calc. - Fraction of Ore Material from Blast
				(from Project Information)
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.006	***Blasting -Waste***			
	Horizontal Area of Blast (A)	140,000	sq.ft.	BMM
	Drilled Holes/Blast	225	holes/blast	BMM
	Blasts/Unit Time	0.80	blasts/time	Calc. - Fraction of Waste Material from Blast
				(from Project Information)
	Emission Control Factor (ECF)	0%	Uncontrolled	

1.007	***Explosive Detonation - Ore Blasting***			
	Ammonium Nitrate Used Per Hole (Primary Explosive)	229	lbs/hole	Calc. Ammonium Nitrate used/holes drilled
	PETN Used Per Hole (Booster)	1	lbs/hole	BMM
	Drilled Holes/Blast	225	holes/blast	BMM
	Blasts/Unit Time	1.00	blasts/time	Enviroscientists Assumption
	Percentage Ore Obtained from Blast	19	%	Project Information
	Ammonium Nitrate Used Per Unit Time	4.98	tons/time (ANFO)	Calc. - [ANFO (lbs/hole)*(holes/blast)
				(blasts/time)(Percentage Ore)]/2000
	PETN Used Per Unit Time	0.02	tons/time (PETN)	Calc. - [PETN (lbs/hole)*(holes/blast)
				(blasts/time)(Percentage Ore)]/2000
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.008	***Explosive Detonation - Waste Blasting***			
	Ammonium Nitrate Used Per Hole (Primary Explosive)	229	lbs/hole	Calc. Ammonium Nitrate used/holes drilled
	PETN Used Per Hole (Booster)	2	lbs/hole	
	Drilled Holes/Blast	225	holes/blast	
	Blasts/Unit Time	1.00	blasts/time	Enviroscientists Assumption
	Percentage Waste Obtained from Blast	81	%	Project Information
	Ammonium Nitrate Used Per Unit Time	20.74	tons/time (ANFO)	Calc. - [ANFO (lbs/hole)*(holes/blast)
				(blasts/time)(Percentage Waste)]/2000
	PETN Used Per Unit Time	0.18	tons/time (PETN)	Calc. - [PETN (lbs/hole)*(holes/blast)
				(blasts/time)(Percentage Waste)]/2000
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.009	***Loading - Ore***			
	Tons Ore/Unit Time	19,000	tons/time	Project Information
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.010	***Loading - Waste***			
	Tons Waste Rock/Unit Time	76,000	tons/time	Project Information
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.011	***Loaders (Pit) - Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	2	hours	BMM
	Individual Unit Hours Used/Unit Time	2.0	hrs/time	Calc. - % availability * %utilization * hours/time
	No. Units	2	Unit	BMM
	Average Horsepower	1,500	hp	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.012	***Hydraulic Shovel - Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	17	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	2,600	hp	BMM
	No. Units	2	Unit	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	

1.013	***Rotary Drills - Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	14	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	650	hp	BMM
	No. Units	4	Unit	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.014	***Motor Grader - Combustion***			
	Availability of Individual Units	100%		
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	10	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	275	hp	BMM
	No. Units	3	Unit	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.015	***Blasting Trucks - Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	5	hours	BMM
	Individual Unit Hours Used/Unit Time	4.0	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	200	hp	BMM
	No. Units	2	Unit	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.016	***Excavator- Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	8	hours	BMM
	Individual Unit Hours Used/Unit Time	4.0	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	270	hp	BMM
	No. Units	1	Unit	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	
1.017	***Water Trucks - Combustion***			
	Availability of Individual Units	100%		
	Utilization of Individual Units	80%		
	Maximum Daily Hours of Operation	8	hours	
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	1,000	hp	
	No. Units	3	Unit	
	Emission Control Factor (ECF)	0%	Uncontrolled	

1.018	***Water Trucks - Fugitive Emissions***			
	Vehicle Speed (S) - Watering	5	MPH	Enviroscientists Assumption
	Vehicle Speed (S) - Not Watering	12	MPH	
	Total Miles of Haul Roads	30.55	miles	Enviroscientists Calculation
	Maximum Daily Hours of Operation	8	hours	
	Loaded Vehicle Weight	184	tons	CGM - Weighted Average
	Empty Vehicle Weight	92	tons	CGM - Weighted Average
	Average Vehichle Weight	138	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	
	Hours to Travel All Haul Roads	8.66	hours	Calc. - (Miles of Haul Roads/Watering Vehicle
				Speed)+ (Miles of Haul Roads/Not Watering
				Vehicle Speed)
	Vehicle Miles Travelled Per Vehicle Per Day	28	miles	Calc. - (hours/day / hours to travel all haul roads)
				*Total Miles of Haul Road
	Number of Units	3		
	Total Vehicle Miles Travelled Per Day	85	miles	Calc. - (Vehicle Miles Travelled Per Vehicle
	Total Time travel for all vehicles	24		Per Day)*Number of Units
	Emission Control Factor (ECF)	50%	Watering	
	Emission Unit Group 2: Ore Handling			
2.001	***Hauling of Ore - North Pit to BMM 2/3 Heap Leach Pad***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	BMM
	Empty Vehicle Weight	220	tons	BMM
	Average Vehichle Weight	340	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	
	Vehicle Miles Traveled/Load	10.97	VMT/load	Enviroscientists Calculation
	Daily Average Material to Leach Pad	19000	tons/time	Calc. - %Ore to BMM Leach * tons ore mined/day
	Average Weight per Load	240	tons/load	
	Loads/Unit Time	79	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	868.09	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	
2.002	***Hauling of Ore - Top/Sage Pit to BMM 2/3 Heap Leach Pad***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	BMM
	Empty Vehicle Weight	220	tons	BMM
	Average Vehichle Weight	340	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	BMM
	Vehicle Miles Traveled/Load	28.88	VMT/load	Enviroscientists Calculation
	Daily Average Material to Leach Pad	3750	tons/time	Calc. - %Ore to BMM Leach * tons ore mined/day
	Average Weight per Load	240	tons/load	
	Loads/Unit Time	16	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	451.17	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	
2.003	***Hauling of Ore- Top/ Sage Pit to Mooney Heap Leach Pad***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	BMM
	Empty Vehicle Weight	220	tons	BMM
	Average Vehichle Weight	340	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	BMM
	Vehicle Miles Traveled/Load	22.86	VMT/load	Enviroscientists Calculation
	Daily Average Material to Leach Pad	15000	tons/time	Calc. - %Ore to Mooney Leach * tons ore mined/day
	Average Weight per Load	240	tons/load	
	Loads/Unit Time	63	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	1428.46	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	

2.004	***Hauling of Ore - North Pit to BMM 2/3 Heap Leach Pad- Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	10.97	VMT/load	Enviroscientists Calculation
	Average Horsepower	3,500	hp	BMM
	Loads/Unit Time	79.17	loads/time	
	Average Material to BMM 2/3 Leach	19000	tons/time	
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	
	Time to Move Ore	72.3	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	
2.005	***Hauling of Ore - Top/Sage Pit to BMM 2/3 Heap Leach Pad- Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	28.88	VMT/load	Enviroscientists Calculation
	Average Horsepower	3,500	hp	BMM
	Loads/Unit Time	15.63	loads/time	
	Average Material to BMM 2/3 Leach	3750	tons/time	
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	
	Time to Move Ore	37.6	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	
2.006	**Hauling of Ore- Top/ Sage Pit to Mooney Heap Leach Pad- Combustion**			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	22.86	VMT/load	Enviroscientists Calculation
	Average Horsepower	3,500	hp	BMM
	Loads/Unit Time	62.50	loads/time	
	Average Material to Mooney Leach	15000	tons/time	
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	
	Time to Move Ore	119.0	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	
	Emission Unit Group 3: Waste Handling			
3.001	***Hauling of Waste to Sage Flat RDA***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	
	Empty Vehicle Weight	220	tons	
	Average Vehicle Weight	340	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	
	Vehicle Miles Traveled/Load	1.60	VMT/load	Enviroscientists Calculation
	Average Material to RDA	106,250	tons/time	Project Information
	Average Weight per load	240	tons/load	
	Loads/Unit Time	443	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	708.33	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	

3.002	***Hauling of Waste to East Sage RDA***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	
	Empty Vehicle Weight	220	tons	
	Average Vehicle Weight	340	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	
	Vehicle Miles Traveled/Load	1.60	VMT/load	Enviroscientists Calculation
	Average Material to RDA	106,250	tons/time	Project Information
	Average Weight per load	240	tons/load	
	Loads/Unit Time	443	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	708.33	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	
3.003	***Hauling of Waste to South Water Canyon RDA***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	
	Empty Vehicle Weight	220	tons	
	Average Vehicle Weight	340	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	
	Vehicle Miles Traveled/Load	1.60	VMT/load	Enviroscientists Calculation
	Average Material to RDA	106,250	tons/time	Project Information
	Average Weight per load	240	tons/load	
	Loads/Unit Time	443	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	708.33	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	
3.004	***Hauling of Waste to North 1RDA***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	
	Empty Vehicle Weight	220	tons	
	Average Vehicle Weight	340	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	
	Vehicle Miles Traveled/Load	1.00	VMT/load	Enviroscientists Calculation
	Average Material to RDA	76,000	tons/time	Project Information
	Average Weight per load	240	tons/load	
	Loads/Unit Time	317	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	316.67	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	
3.005	***Hauling of Waste to North 2 RDA***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	
	Empty Vehicle Weight	220	tons	
	Average Vehicle Weight	340	tons	Calc - Average of loaded and unloaded truck
	Mean Number of Wheels (w)	6	wheels	
	Vehicle Miles Traveled/Load	1.00	VMT/load	Enviroscientists Calculation
	Average Material to RDA	76,000	tons/time	Project Information
	Average Weight per load	240	tons/load	
	Loads/Unit Time	317	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	316.67	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	

3.006	***Hauling of Waste to North 5 RDA***			
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Loaded Vehicle Weight	460	tons	
	Empty Vehicle Weight	220	tons	
	Average Vehicle Weight	340	tons	Calc - Average of loadad and unloaded truck
	Mean Number of Wheels (w)	6	wheels	
	Vahicle Miles Traveled/Load	1.00	VMT/load	Enviroscientists Calculation
	Avarage Material to RDA	76,000	tons/time	Project Information
	Average Weight per load	240	tons/load	
	Loads/Unit Time	317	loads/time	Calc. - tons/time / loads/time
	Vehicle Miles Traveled/Unit Time	316.67	VMT/time	Calc. - VMT/load * loads/time
	Emission Control Factor (ECF)	50%	Watering	
3.007	***Hauling of Waste to Sage Flat RDA -Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	1.60	VMT/load	Enviroscientists Calculation
	Avarage Horsepower	3,500	hp	BMM
	Loads/Unit Time	443	loads/time	
	Average Material to RDA	76,000	tons/time	
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Time to Move Waste Rock	59.0	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	
3.008	***Hauling of Waste to East Sage RDA -Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	1.60	VMT/load	Enviroscientists Calculation
	Average Horsepower	3,500	hp	BMM
	Loads/Unit Time	443	loads/time	
	Average Matarial to RDA	106,250	tons/time	
	Average Vehicla Speed (S) - Loaded and Empty	12	MPH	Project Information
	Time to Move Waste Rock	59.0	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	
3.009	***Hauling of Waste to South Water Canyon RDA -Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Oparation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	1.60	VMT/load	Enviroscientists Calculation
	Average Horsepower	3,500	hp	BMM
	Loads/Unit Time	443	loads/time	
	Average Material to RDA	106,250	tons/time	
	Average Vehicle Spaed (S) - Loaded and Empty	12	MPH	Project Information
	Time to Move Waste Rock	59.0	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	

3.010	***Hauling of Waste to North 1RDA -Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	1.00	VMT/load	Enviroscientists Calculation
	Average Horsepower	3,500	hp	BMM
	Loads/Unit Time	317	loads/time	
	Average Material to RDA	76,000	tons/time	
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Time to Move Waste Rock	26.4	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	
3.011	***Hauling of Waste to North 2 RDA -Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	1	VMT/load	Enviroscientists Calculation
	Average Horsepower	3,500	hp	BMM
	Loads/Unit Time	317	loads/time	
	Average Material to RDA	76,000	tons/time	
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Time to Move Waste Rock	26	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	
3.012	***Hauling of Waste to North 5 RDA -Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	20	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Vehicle Miles Traveled/Load	1	VMT/load	Enviroscientists Calculation
	Average Horsepower	3,500	hp	BMM
	Loads/Unit Time	317	loads/time	
	Average Material to RDA	76,000	tons/time	
	Average Vehicle Speed (S) - Loaded and Empty	12	MPH	Project Information
	Time to Move Waste Rock	26	hours	Calc. - VMT * Number of Trips / Vehicle Speed
	Emission Control Factor (ECF)	0%	Uncontrolled	
3.013	***Wind Erosion- RDAs***			
	Size of Active RDAs	290	acres	Project Information
	Emission Control Factor (ECF)	0%	Uncontrolled	
3.014	***Waste Unloading***			
	Tons Waste Rock/Unit Time	106,250	tons/time	Project Information
	Emission Control Factor (ECF)	0%	Uncontrolled	
3.015	***Waste Dozing***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	10	hours	BMM
	Hours Dozing/Unit Time	10	hours/time	Calc. - % availability * %utilization * hours/time
	No. Units	5	Unit	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	

3.016	***Waste Dozing - Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	10	hours	BMM
	Hours Dozing/Unit Time	10	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	600	hp	BMM
	No. Units	5	Unit	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	
	Emission Unit Group 4: Heap Leaching			
4.001	***Unloading Ore - BMM 2/3 Leach Pad***			
	Tons Ore Unloaded/Unit Time	22,750	tons/time	Calc. - Ore Mined per Day @ Leach
	Emission Control Factor (ECF)	0%	Uncontrolled	
4.002	***Unloading Ore - Mooney Leach Pad***			
	Tons Ore Unloaded/Unit Time	30,200	tons/time	Calc. - Ore Mined per Day @ Leach
	Emission Control Factor (ECF)	0%	Uncontrolled	
4.003	***Ore Dozing - BMM 2/3 Leach Pad***			
	Hours Dozing/Unit Time	0.5	hours/time	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	
4.004	***Ore Dozing - Mooney Leach Pad***			
	Hours Dozing/Unit Time	0.5	hours/time	BMM
	Emission Control Factor (ECF)	0%	Uncontrolled	
4.005	***Ore Dozing (BMM 2/3 Leach Pad)- Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	10	hours	BMM
	Individual Unit Hours Used/Unit Time	8.0	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	600	hp	BMM
	No. Units	1	Unit	
	Emission Control Factor (ECF)	0%	Uncontrolled	
4.006	***Ore Dozing (Mooney Leach Pad)- Combustion***			
	Availability of Individual Units	100%		BMM
	Utilization of Individual Units	80%		BMM
	Maximum Daily Hours of Operation	10	hours	BMM
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	600	hp	BMM
	No. Units	1	Unit	
	Emission Control Factor (ECF)	0%	Uncontrolled	
4.007	***Wind Erosion - BMM 2/3 Leach Pad***			
	Size of Leach Pad Under Leach	10	acres	
	Size of Leach Pad with Fresh Ore	15	acres	
	Emission Control Factor - Non-Leach (ECF)	0%	Uncontrolled	
	Emission Control Factor - Leach Area (ECF)	95%	Leachate	

4.008	***Wind Erosion - Mooney Leach Pad***			
	Size of Leach Pad Under Leach	12	acres	
	Size of Leach Pad with Fresh Ore	15	acres	
	Emission Control Factor - Non-Leach (ECF)	0%	Uncontrolled	
	Emission Control Factor - Leach Area (ECF)	95%	Leachate	
	Emission Unit Group 5: Refinery			
5.001	***Carbon Reactivation Kiln (North)- Carbon throughput***			
	Hourly Throughput	0.1250	tons/hour	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Tons Processed / Unit Time	3.0	tons/time	Calc. - tons/hour * hours
	Emission Control Factor (ECF)	0%	Uncontrolled	
5.002	***Carbon Reactivation Kiln (Mooney)- Carbon throughput***			
	Hourly Throughput	0.1250	tons/hour	
	Hours of Operation / Unit Time	24	hours/time	
	Tons Processed / Unit Time	3.0	tons/time	Calc. - tons/hour * hours
	Emission Control Factor (ECF)	0%	Uncontrolled	
5.003	***Mercury Retort (North)- Throughput***			
	Hourly Throughput	0.2	tons/hour	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Tons Processed / Unit Time	4.8	tons/time	Calc. - tons/hour * hours
	Emission Control Factor (ECF)	0%	Uncontrolled	
5.004	***Mercury Retort (Mooney)- Throughput***			
	Hourly Throughput	0.2	tons/hour	
	Hours of Operation / Unit Time	24	hours/time	
	Tons Processed / Unit Time	4.8	tons/time	Calc. - tons/hour * hours
	Emission Control Factor (ECF)	0%	Uncontrolled	
5.005	***Bullion Furnance (North)- Throughput***			
	Hourly Throughput	0.05	tons/hour	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Tons Processed / Unit Time	1.2	tons/time	Calc. - tons/hour * hours
	Emission Control Factor (ECF)	99%	Baghouse	
5.006	***Bullion Furnance (North)- Combustion 0.85MMBtu***			
	Heat Input	0.85	mmBtu/hour	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Propane Heating Value	0.09	mmBtu/gal	Project Information
	Fuel Consumption / Hour	9.29	gal/hour	Air Quality Permit No. AP1041-1362
	Fuel Consumption / Unit Time	223	gal/time	Calc. - gal/hour * hours/time
	Emission Control Factor (ECF)	99%	Baghouse	
5.007	***Bullion Furnance (Mooney)- Throughput***			
	Hourly Throughput	0.05	tons/hour	
	Hours of Operation / Unit Time	24	hours/time	
	Tons Processed / Unit Time	1.2	tons/time	Calc. - tons/hour * hours
	Emission Control Factor (ECF)	99%	Baghouse	

5.008	***Bullion Furnance (Mooney)- Combustion 0.85MMBtu***			
	Heat Input	0.85	mmBtu/hour	
	Hours of Operation / Unit Time	24	hours/time	
	Propane Heating Value	0.09	mmBtu/gal	Project Information
	Fuel Consumption / Hour	9.29	gal/hour	
	Fuel Consumption / Unit Time	223	gal/time	Calc. - gal/hour * hours/time
	Emission Control Factor (ECF)	99%	Baghouse	
	Emission Unit Group 7: Standby Generators			
7.001	***#888-810 HP Generator 1(BMM process facility)***			
	Engine Rating	810	HP	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Emission Control Factor (ECF)	0%	Uncontrolled	
7.002	***#888-810 HPGenerator 2 (Mooney process facility)***			
	Engine Rating	810	HP	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Emission Control Factor (ECF)	0%	Uncontrolled	
7.003	***Generator 3 (Admin building)***			
	Engine Rating	100	HP	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Emission Control Factor (ECF)	0%	Uncontrolled	
7.004	***Generator 4 (truck shop)***			
	Engine Rating	60	HP	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Emission Control Factor (ECF)	0%	Uncontrolled	
7.005	***Generator 5 (truck shop)***			
	Engine Rating	120	HP	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Emission Control Factor (ECF)	0%	Uncontrolled	
	Emission Unit Group 8: Portable Crushing System			
8.001	***Loader (Crusher) - Combustion***			
	Availability of Individual Units	100%		
	Utilization of Individual Units	80%		
	Maximum Daily Hours of Operation	24	hours	
	Individual Unit Hours Used/Unit Time	19.2	hrs/time	Calc. - % availability * %utilization * hours/time
	Average Horsepower	800	hp	
	No. Units	1	Unit	
	Emission Control Factor (ECF)	0%	Uncontrolled	
8.002	***Loader Transfer to Grizzly Feeder***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	

8.003	***Grizzly Feeder transfer to Jaw Crusher***			
	Hourly Throughput	300	tons/hour	Enviroscientists Estimate
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.004	***Jaw Crusher***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	75%	Water Sprays	Air Quality Permit No. AP1611-2227
8.005	***Jaw Crusher transfer to Underjaw Conveyor***			
	Hourly Throughput	300	tons/hour	Enviroscientists Estimate
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.006	***Underjaw conveyor transfer to Primary Screen Feed Conveyor***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	75%	Water Sprays	Air Quality Permit No. AP1611-2227
8.007	***Primary Screen Feed Conveyor transfer to Primary Screen***			
	Hourly Throughput	300	tons/hour	Enviroscientists Estimate
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.008	***Primary Screen***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.009	***Primary Screen transfer to Under Screen Belt #1***			
	Hourly Throughput	100	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.010	***Primary Screen transfer to Stowe Cross Belt #1***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.011	***Under Screen Belt #1 transfer to Transfer Conv #1***			
	Hourly Throughput	100	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	75%	Water Sprays	Air Quality Permit No. AP1611-2227

8.012	***Transfer Conveyor #1 transfer to Reject Sand Stacker***			
	Hourly Throughput	100	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	
8.013	***Reject Sand Stacker transfer to Reject Stockpile***			
	Hourly Throughput	100	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.014	***Stowe Cross Belt #1 transfer to Finish Screen Feed Belt***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	75%	Water Sprays	Air Quality Permit No. AP1611-2227
8.015	***Return Belt transfer to Finish Screen Feed Belt***			
	Hourly Throughput	175	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,750	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	75%	Water Sprays	Air Quality Permit No. AP1611-2227
8.016	***Finish Screen Feed Belt transfer to Screen #2***			
	Hourly Throughput	475	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	4,750	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.017	***Finish Screen #2***			
	Hourly Throughput	475	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	4,750	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	75%	Water Sprays	Air Quality Permit No. AP1611-2227
8.018	***Screen #2 transfer to Under Screen Belt #2***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.019	***Screen #2 transfer to Stowe Cross Belt #1***			
	Hourly Throughput	175	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,750	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.020	***Stowe Cross Belt #1 transfer to Cone Feed Conveyor***			
	Hourly Throughput	175	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,750	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227

8.021	***Cone Feed Conveyor transfer to Cedar Rapids Cone***			
	Hourly Throughput	175	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,750	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.022	***Cedar Rapids Cone***			
	Hourly Throughput	175	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,750	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	75%	Water Sprays	Air Quality Permit No. AP1611-2227
8.023	***Cedar Rapids Cone transfer to Cone Return Belt***			
	Hourly Throughput	175	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	1,750	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.024	***UnderScreen Belt #2 transfer to Type II Transfer Belt***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	75%	Water Sprays	Air Quality Permit No. AP1611-2227
8.025	***Type II Transfer Belt transfer to Product Stacker***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.026	***Product Stacker transfer to Finish Stockpile***			
	Hourly Throughput	300	tons/hour	Air Quality Permit No. AP1611-2227
	Hours of Operation / Unit Time	10	hours/time	Air Quality Permit No. AP1611-2227
	Tons Processed / Unit Time	3,000	tons/time	Calc. - tons/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1611-2227
8.027	***Wind Erosion- Finish Stockpile***			
	Size of Ore Stockpile	2.0	acres	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
Emission Unit Group 9: Other Sources				
9.001	***Waste oil heater (250,000Btu)***			
	Heat Input	0.25	mmBtu/hour	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Propane Heating Value	0.09	mmBtu/gal	Project Information
	Fuel Consumption / Hour	2.8	gal/hour	
	Fuel Consumption / Unit Time	66	gal/time	Calc. - gal/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.002	***Heap leach lime silo loading***			
	Hourly Throughput	50	tons/hour	Air Quality Permit No. AP1041-1336
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1336
	Tons Processed / Unit Time	1,200	tons/time	
	Emission Control Factor (ECF)	90%	Bin vent	Air Quality Permit No. AP1041-1336

9.003	***Heap leach lime silo discharge to lime conveyor***			
	Hourly Throughput	20	tons/hour	Air Quality Permit No. AP1041-1336
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1336
	Tons Processed / Unit Time	480	tons/time	
	Emission Control Factor (ECF)	50%	enclosure	Air Quality Permit No. AP1041-1336
9.004	***Heap leach lime conveyor transfer to dosing hopper***			
	Hourly Throughput	20	tons/hour	Air Quality Permit No. AP1041-1336
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1336
	Tons Processed / Unit Time	480	tons/time	
	Emission Control Factor (ECF)	50%	enclosure	Air Quality Permit No. AP1041-1336
9.005	***Dosing Hopper transfer to truck***			
	Hourly Throughput	20	tons/hour	Air Quality Permit No. AP1041-1336
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1336
	Tons Processed / Unit Time	480	tons/time	
	Emission Control Factor (ECF)	0%	Uncontrolled	Air Quality Permit No. AP1041-1336
9.006	***Propane Refinery Boiler (2.5 million Btu)***			
	Boiler Rating	2.50	mmBtu/hour	Air Quality Permit No. AP1041-1362
	Hours of Operation / Unit Time	24	hours/time	Air Quality Permit No. AP1041-1362
	Propane Heating Value	0.09	mmBtu/gal	Project Information
	Fuel Consumption / Hour	53.8	gal/hour	
	Fuel Consumption / Unit Time	1,291	gal/tima	Calc. - gal/hour * hours/time
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.007	***Light Plant #1***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.008	***Light Plant #2***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Tima	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.009	***Light Plant #3***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.010	***Light Plant #4***			
	Numbar of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.011	***Light Plant #5***			
	Numbar of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	

9.012	***Light Plant #6***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.013	***Light Plant #7***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.014	***Light Plant #8***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.015	***Light Plant #9***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.016	***Light Plant #10***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.017	***Light Plant #11***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	
9.018	***Light Plant #12***			
	Number of Units	1		
	Size of Light Plants	30	HP	
	Hours of Operation / Unit Time	12	hours/time	Enviroscientists Estimate
	Emission Control Factor (ECF)	0%	Uncontrolled	

APPENDIX C

AERMOD Model Input and Output Files, Digital Emission Inventories, and DEM Quadrangles

APPENDIX I

Visual Resource Information

View to the east from KOP 1, existing conditions.

View to the southwest from KOP 2, existing conditions.

Figure I-1

View to the southwest from KOP 3, existing conditions.

View to the southwest from KOP 4, existing conditions.

Figure I-2


View from KOP 2, existing conditions.


Simulated view of North Area RDA from KOP 2 during active mining.


Simulated view from KOP 2 after successful reclamation.

Figure I-3

View from KOP 3, existing conditions.

Simulated view of expanded East Sage RDA from KOP 3 during active mining.

Simulated view from KOP 3 after successful reclamation.

Figure I-4

View from KOP 4, existing conditions.

Simulated view of expanded Mooney Leach Pad from KOP 4 during active mining.

Simulated view from KOP 4 after successful reclamation.

Figure I-5

Visual Contrast Rating Worksheets

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA – Proposed Action and Alternatives A and B	**KOP Location**
Key Observation Point	KOP 1, View to E During active mining	UTM Zone 11, NAD83
VRM Class	III and IV	E 0607680 N 4422822

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Tan, gray-green, dark green	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Light tan	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	3	2	4
Line	3	2	4
Color	2	2	4
Texture	2	2	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. During active mining, elements of the Proposed Action such as RDAs and leach pads would create additional areas of contrast with surrounding undisturbed landforms and vegetation. This contrast would be moderate because of the existing disturbance that is visible and the distance of the disturbance from the observer. VRM Class III and IV allow for moderate contrast.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA – Proposed Action and Alternatives A and B	**KOP Location**
Key Observation Point	KOP 1, View to E Following reclamation	UTM Zone 11, NAD83
VRM Class	III and IV	E 0607680 N 4422822

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Tan, gray-green, dark green	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Light tan	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	3	3	4
Line	3	3	4
Color	3	3	4
Texture	3	3	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. Following successful reclamation, the degree of contrast from reclaimed areas would be weak and project elements would tend to blend in with the surroundings.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA – Proposed Action and Alternatives A and B	**KOP Location**
Key Observation Point	KOP 2, View to SW During active mining	UTM Zone 11, NAD83
VRM Class	IV	E 0623503 N 4431354

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Gray-green, dark green	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Tan	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	3	2	4
Line	3	2	4
Color	2	2	4
Texture	2	2	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. During active mining the North Area RDA would contrast with surrounding undisturbed landforms and vegetation. The contrast would be moderate because of the distance from the observer and relatively small portion of the view affected. Class IV allows for moderate contrast.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA – Proposed Action and Alternatives A and B	**KOP Location**
Key Observation Point	KOP 2, View to SW Following reclamation	UTM Zone 11, NAD83
VRM Class	IV	E 0623503 N 4431354

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Gray-green, dark green	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Tan	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	3	3	4
Line	3	3	4
Color	3	3	4
Texture	3	3	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. Following successful reclamation, the degree of contrast would be weak and the North Area RDA would tend to blend in with the surrounding area.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA – Proposed Action and Alternatives A and B	**KOP Location**
Key Observation Point	KOP 3, View to SW During active mining	UTM Zone 11, NAD83
VRM Class	III	E 0631057 N 4424899

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Gray-green, dark green	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Tan	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	3	1	4
Line	3	1	4
Color	1	1	4
Texture	1	1	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? No. During active mining the East Sage RDA would contrast with surrounding undisturbed landforms and vegetation. The contrast would be strong because of the large portion of the view affected.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA – Proposed Action and Alternatives A and B	**KOP Location**
Key Observation Point	KOP 3, View to SW Following reclamation	UTM Zone 11, NAD83
VRM Class	III	E 0631057 N 4424899

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Gray-green, dark green	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	None
Line	Horizontal and diagonal	Complex	None
Color	Tan	Gray-green, dark green	None
Texture	Coarse, rough	Smooth, gradational	None

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	3	2	4
Line	3	2	4
Color	2	2	4
Texture	2	2	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. Following successful reclamation, the degree of contrast of the East Sage RDA would be moderate because of the distance and the similarity to the color and texture of surrounding land. The RDA would tend to blend in with the existing hills. Management objectives for VRM Class III allow for moderate contrast.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA – Proposed Action and Alternative A	**KOP Location**
Key Observation Point	KOP 4, View to SW During active mining	UTM Zone 11, NAD83
VRM Class	III	E 0630734
		N 4420006

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	Irregular (power poles)
Line	Horizontal and diagonal	Complex	Vertical
Color	Tan, gray-green, dark green	Gray-green, dark green	Dark brown
Texture	Coarse, rough	Smooth, gradational/abrupt	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Indistinct, irregular	Irregular
Line	Horizontal	Complex	Vertical
Color	Tan, gray-green	Gray-green	Dark brown
Texture	Smooth	Abrupt	Smooth

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	1	1	4
Line	1	1	4
Color	1	1	4
Texture	1	1	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? No. During active mining the leach pad would contrast with surrounding undisturbed landforms and vegetation. The contrast would be strong because of the scale and marked differences in color and texture.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA – Proposed Action and Alternative A	**KOP Location**
Key Observation Point	KOP 4, View to SW Following reclamation	UTM Zone 11, NAD83
VRM Class	III	E 0630734
		N 4420006

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	Irregular (power poles)
Line	Horizontal and diagonal	Complex	Vertical
Color	Tan, gray-green, dark green	Gray-green, dark green	Dark brown
Texture	Coarse, rough	Smooth, gradational/abrupt	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Indistinct, irregular	Irregular
Line	Horizontal	Complex	Vertical
Color	Tan, gray-green	Gray-green	Dark brown
Texture	Smooth	Abrupt	Smooth

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	2	2	4
Line	2	2	4
Color	2	2	4
Texture	2	2	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. Following successful reclamation the degree of contrast would be moderate. The color and texture of the reclaimed leach pad would blend more with surrounding landforms and vegetation but the form would likely not appear entirely natural. Management objectives for VRM Class III allow for moderate contrast.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA –Alternative B	**KOP Location**
Key Observation Point	KOP 4, View to SW During active mining	UTM Zone 11, NAD83
VRM Class	III	E 0630734
		N 4420006

Section B. Characteristic Landscape Description

	Land/Water	**Vegetation**	**Structures**
Form	Flat to rolling terrain	Indistinct, irregular	Irregular (power poles)
Line	Horizontal and diagonal	Complex	Vertical
Color	Tan, gray-green, dark green	Gray-green, dark green	Dark brown
Texture	Coarse, rough	Smooth, gradational/abrupt	Smooth

Section C. Proposed Activity Description

	Land/Water	**Vegetation**	**Structures**
Form	Flat terrain	Indistinct, irregular	Irregular
Line	Horizontal	Complex	Vertical
Color	Tan, gray-green	Gray-green	Dark brown
Texture	Smooth	Abrupt	Smooth

Section D. Contrast Rating

	Land/Water	**Vegetation**	**Structures**
Form	1	1	4
Line	1	1	4
Color	1	1	4
Texture	1	1	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? No. During active mining the leach pad, although smaller than the Proposed Action and Alternative A, would still contrast with surrounding undisturbed landforms and vegetation. The contrast would be strong because of the scale and marked differences in color and texture.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

Visual Contrast Rating Worksheet

Section A. Project Information

Project Name	Bald Mountain Mine NOA –Alternative B	**KOP Location**
Key Observation Point	KOP 4, View to SW Following reclamation	UTM Zone 11, NAD83
VRM Class	III	E 0630734 N 4420006

Section B. Characteristic Landscape Description

	Land/Water	Vegetation	Structures
Form	Flat to rolling terrain	Indistinct, irregular	Irregular (power poles)
Line	Horizontal and diagonal	Complex	Vertical
Color	Tan, gray-green, dark green	Gray-green, dark green	Dark brown
Texture	Coarse, rough	Smooth, gradational/abrupt	Smooth

Section C. Proposed Activity Description

	Land/Water	Vegetation	Structures
Form	Flat terrain	Indistinct, irregular	Irregular
Line	Horizontal	Complex	Vertical
Color	Tan, gray-green	Gray-green	Dark brown
Texture	Smooth	Abrupt	Smooth

Section D. Contrast Rating

	Land/Water	Vegetation	Structures
Form	2	2	4
Line	2	2	4
Color	2	2	4
Texture	2	2	4

Notes: Degree of Contrast: 1 = Strong; 2 = Moderate; 3 = Weak; 4 = None

Does project design meet visual resource management objectives? Yes. Following successful reclamation, the degree of contrast would be moderate. The color and texture of the reclaimed leach pad would blend more with surrounding landforms and vegetation but the form would likely not appear entirely natural. Management objectives for VRM Class III allow for moderate contrast.

Additional mitigating measures recommended. None.

Evaluator: R. Duncan, JBR Environmental Consultants
Date: July 2007, revised February 2009

APPENDIX J

Programmatic Agreement

PROGRAMMATIC AGREEMENT

AMONG THE BUREAU OF LAND MANAGEMENT, ELY DISTRICT, NEVADA NEVADA STATE HISTORIC PRESERVATION OFFICE, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE TREATMENT OF HISTORIC PROPERTIES DURING MINERAL DEVELOPMENT IN THE BALD MOUNTAIN MINING DISTRICT BY BALD MOUNTAIN MINE

WHEREAS, the Bureau of Land Management, Ely District, ("BLM") has determined that mineral development in the Bald Mountain Mining District ("BMMD") by Bald Mountain Mine ("BMM"), situated in White Pine County, Nevada, may have an effect upon properties eligible for inclusion in the National Register of Historic Places, and has consulted with the Nevada State Historic Preservation Officer ("SHPO") and the Advisory Council on Historic Preservation ("COUNCIL") pursuant to Section 800.13 of the regulations (36 CFR 800) implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470(f)), and

WHEREAS, BMM, the operator of several mines within the BMMD, participated in the consultation and has been invited to concur in this Programmatic Agreement, and

WHEREAS, this Programmatic Agreement is intended to cover all aspects of mineral development in the BMMD which is controlled or operated by BMM, and

WHEREAS, the definitions given in the Programmatic Agreement of August, 1990 among the Bureau of Land Management, Nevada State Office, Nevada State Historic Preservation Office, and the Advisory Council on Historic Preservation Regarding the Identification, Evaluation and Treatment of Historic Properties Throughout the State of Nevada on Lands Managed by the Bureau of Land Management, Nevada State Office (BLM Statewide Agreement) are applicable throughout this Agreement;

NOW THEREFORE, the parties agree that mineral development in the BMMD shall be administered in accordance with the following stipulations to satisfy the BLM's Section 106 responsibilities for all individual projects undertaken within the BMMD.

PURPOSE

BMM proposes to explore for mineral deposits and to conduct mineral extraction activities ("Undertaking") in the BMMD which are multi-year in scope and located on public lands with interspersed patented (private) land. Cultural inventories have identified historic properties in the area of the undertaking which are eligible to the National Register of Historic Places (NRHP). Other historic properties have been identified in the area of the undertaking that may be determined to be eligible after further evaluation.

The purpose of this Programmatic Agreement is to establish an understanding between the BLM, the COUNCIL, the SHPO, and BMM as to how the consultation process under Section 106 of the National Historic Preservation Act will be implemented with regard to the Undertaking.

The Programmatic Agreement ("Agreement") defines general and specific measures that will be undertaken by all parties to ensure that the mutual objectives and individual requirements of the National Historic Preservation Act are fulfilled.

INTENT

Subject to the limitations found in the BLM Statewide Agreement and guidelines in Stipulation A.3. of this Agreement, historic properties will be treated in such a way that effects are avoided or mitigated to the extent practicable, regardless of surface ownership.

AREA DESCRIPTIONS

The cultural resources review area for this undertaking is the Bald Mountain Mining District (BMMD) as defined in Appendix A.

Prior to conducting activities in the BMMD related to proposed mineral exploration or extraction on lands that have not been disturbed by the existing mining operations or within areas of known historic properties (regardless of ownership), BMM shall submit to the BLM plans of operation or amendments to existing plans as appropriate for BLMs review under this agreement.

STIPULATIONS

The BLM shall ensure that the following stipulations are implemented:

A. <u>Identification</u>

1. Upon receipt of BMMs proposed mine development plan of operations or any amendments to existing plans of operations, BLM shall seek to identify interested persons pursuant to 36 CFR 800.1(c)(2) and 36 CFR 800.4(a)(1)(iii).

2. The BLM shall ensure that appropriate cultural resource inventory of the Area of Potential Effect (APE) of all activity areas or portions thereof, not previously inventoried is completed, and that appropriate reports are prepared.

3. The BLM shall ensure that an inventory of the APE of any activity area is completed in a manner consistent with stipulation A.2. of this agreement, the BLM Statewide Agreement and the BLMs *Cultural Resources Inventory General Guidelines* (4th edition, January 1990) or any subsequent edition issued by the BLM.

4. The BLM shall ensure that the inventory is conducted by BMM in consultation with the BLM, and that an inventory report is submitted to the BLM by BMM for the BLMs approval. The approved inventory report shall be submitted by the BLM to the SHPO, and interested persons as appropriate, for review and comment. BLM shall consult with the SHPO to resolve the eligibility of identified cultural resources per 36 CFR 800.4(c).

5. The BLM shall ensure that the level, intensity and methods of recording cultural resources conform to the standards identified in Stipulation A.3.

B. Resolving Eligibility

1. The BLM, in consultation with the SHPO, shall ensure that all cultural resources located within the APE of an activity area are evaluated for eligibility to the NRHP prior to the initiation of activities that may affect historic properties.

2. Information gathered by the inventory process may be inadequate to allow determination of a cultural resource's eligibility for the NRHP. In such case, the BLM may, after obtaining SHPOs concurrence on an evaluation plan which may include subsurface testing, authorize the plan under the mandates of the Archeological Resources Protection Act (16 U.S.C. 470aa *et seq.*).

3. In developing a subsurface evaluation plan for SHPO concurrence, the BLM shall ensure that any testing is limited to defining the nature, density and distribution of materials in potential historic properties. Subsurface testing is intended to provide the minimum data necessary to make final evaluations of NRHP eligibility and to devise treatment options responsive to the information potential of the historic properties.

4. Documentation of inventory and evaluation results, including eligibility recommendations, shall be reviewed by the BLM. Upon approval, the BLM shall forward this documentation to the SHPO for review and comment per Stipulation A.4.

5. If the SHPO and the BLM disagree regarding the eligibility of properties for listing on the NRHP, the BLM shall seek a formal determination of eligibility from the Keeper of the National Register in accordance with 36 CFR 800.4. The Keeper's determination will be considered final. BMM will be kept informed of the progress in a timely manner.

C. Treatment

1. In developing treatment plans, the BLM in consultation with SHPO and interested persons, shall determine the precise nature of effects that can be anticipated to the values of historic properties identified in the APE in accordance with 36 CFR 800.5. BLM shall ensure that BMM seeks to avoid properties eligible for inclusion in the NRHP through design of project facilities, relocation of facilities, or by other means, to the extent practicable.

2. Recognizing that avoidance may not be feasible or prudent, the BLM, in consultation with SHPO, BMM and interested persons, shall ensure that BMM develops an appropriate treatment plan designed to lessen or mitigate project-related effects to archaeological resources. For properties eligible under criteria *a* through c (36 CFR 60.4) other forms of mitigation may be considered in the treatment plan in lieu of or in addition to data recovery (*e.g.* oral history, historic markers, exhibits, interpretive brochures or publications).

3. When archaeological data recovery is the preferred treatment option for an eligible property or properties, the BLM shall ensure that BMM develops a plan for the recovery of archaeological data based on an appropriate research design and that the plan is submitted to the SHPO and COUNCIL as stipulated in H.2., for a concurrent 30-day review and comment period. Such data recovery plans and historic or architectural documentation (for historic properties eligible under criterion *d*) shall be consistent with the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-37) and shall conform to Stipulation A.3.

4. If the SHPO, COUNCIL or an interested person objects to all or part of the proposed treatment plan, the BLM shall attempt to resolve the objection pursuant to Stipulation J. Upon completion of the consultation process, the BLM shall ensure that the treatment plan and any modifications to it resulting from the negotiations are implemented.

   a. The BLM shall ensure that any human remains and grave-related artifacts encountered during data recovery are treated with the respect due such evidence and according to federal law, and, to the extent not inconsistent with federal law, state laws and local ordinances.

   b. The BLM shall ensure that all records and materials resulting from identification and treatment efforts are curated in accordance with 36 CFR 79 by a BLM-approved facility in Nevada, and that all materials to be returned to their owners will be maintained in accordance with 36 CFR 79 until the materials analysis is complete and the materials are returned.

      (1) Unless otherwise negotiated all materials must be curated or returned to their owners when the final report is accepted by the BLM.

      (2) The BLM shall hold a surety bond from BMM as specified in Stipulation I until curation is complete.

   c. The BLM shall ensure that all final archeological reports resulting from actions pursuant to this Agreement will be provided to the SHPO and COUNCIL, and made available to other interested parties, and to the National Technical Information Service (NTIS). The BLM shall ensure that all such reports are responsive to contemporary professional standards, and to the Department of the Interior's *Formal Standards for Final Reports of Data Recovery Program* (42 FR 5377-79).

      (1) Precise locational data may be provided only in a separate appendix if it appears that release of locational data could jeopardize historic properties.

      (2) A draft final report shall be due as stated in Stipulation H.3. unless otherwise negotiated.

D. Discovery Situations

1. Cultural resources, not previously identified, which are discovered while conducting mining activities shall be subject to this Agreement. If such cultural resources are discovered, or if known historic properties are being affected in an unanticipated manner, mining related activities within the general vicinity of the discovered resources will cease immediately and BMM shall notify the BLM authorized officer.

2. The BLM shall notify the SHPO and COUNCIL and consider SHPOs initial comments on the discovery. The COUNCIL may offer comments within two days of notification if it chooses. Within two working days of notification to the SHPO and COUNCIL, the BLM shall notify BMM, SHPO and interested persons, as appropriate, of the BLMs decision whether to allow mining related activities to proceed or to seek mitigative measures for the discovered cultural resources per 36 CFR 800.11.

3. If, in consultation with the SHPO, BLM determines that mitigation is appropriate, the BLM shall notify the COUNCIL of the proposed mitigative measures, and request comments from the SHPO and interested persons, as appropriate, on means of mitigating such properties. Any comments offered by the SHPO and interested persons will be documented and made available for public inspection. The SHPO and other interested persons as appropriate will provide BLM with comments in two working days so that they can be considered and the BLM can make a decision regarding the nature and extent of mitigative efforts within seven working days of BLMs notification to BMM of the need for mitigation. The BLM shall notify the SHPO, COUNCIL and interested persons of its decision and shall ensure that such mitigative actions are implemented

4. In the event an objection arises from the SHPO or interested persons, regarding a discovery or the means by which it will be treated, the BLM shall attempt to resolve the objection in accordance with Stipulation J.

5. The BLM shall ensure that reports of mitigation efforts for discovery situations are completed in a timely manner and conform to the Department of the Interior's Formal Standards for *Final Reports of Data Recovery Program* (42 FR 5377-79). Drafts of such reports shall be submitted to the SHPO for a 30-day review and comment as stipulated in H.2. Final reports shall be submitted to the SHPO, COUNCIL and interested persons for informational purposes.

6. Mining activity in the area of the discovery or affected site will be halted until BMM is notified by the BLM Authorized Officer that mitigation is complete and activities can resume.

E. Other Considerations

1. The BLM shall ensure that all stipulations of this Agreement are carried out by the BLM,

BMM, and all of its contractors or other personnel. Non-conformance to the stipulations of this Agreement shall invoke the non-compliance provisions of 43 CFR 3809 and may result in a letter of non-compliance or other litigative actions.

2. The BLM shall ensure that historic, architectural, and archaeological work conducted pursuant to this Agreement is carried out by, or under the direct supervision of persons meeting qualifications set forth in the Secretary of the Interior's *Professional Qualification Standards* (36 CFR 61) and acceptable to the BLM to conduct an inventory and report the results to the BLM.

3. BMM, in cooperation with the BLM and the SHPO, shall ensure that all its personnel, and all the personnel of its contractors, are directed not to engage in the illegal collection of historic and prehistoric materials. BMM shall cooperate with the BLM to ensure compliance with the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa *et seq.*).

4. BMM shall bear the expense of identification, evaluation, and treatment of all historic properties directly or indirectly affected by BMM-related activity to the extent that such properties are situated on land owned or controlled by BMM as shown in Appendix A. Such costs shall include, but not be limited to, pre-field planning, field work, post-fieldwork analysis, research and report preparation, interim and summary report preparation, public interpretation, and costs associated with the curation of project documentation and artifact collections.

F. Reports and Monitoring

The BLM, the SHPO, and the COUNCIL may monitor actions carried out pursuant to this Agreement, and the COUNCIL shall review such actions when so requested. The BLM shall submit a monitoring report to the SHPO and the COUNCIL at least every 12 months. This report will assist the SHPO and the COUNCIL in monitoring actions carried out under this Agreement and provide a basis for review. The reporting year shall conform to the federal fiscal year and the report will be submitted to the SHPO and the COUNCIL by June 1st of the year following the fiscal year under review.

G. Notices to Proceed

Notices to Proceed (NTP) may be issued by the BLM to BMM under any of the following conditions:

1. the APE has been inventoried and BLM and SHPO have determined that there are no historic properties within the APE;

2. evaluation of potentially eligible sites has been conducted and BLM and SHPO have determined that the site(s) are not eligible;

3. a treatment option for historic properties affected by the activity has been approved by the BLM after consultation with the SHPO and interested persons. If the treatment option selected for a historic property requires fieldwork to be performed, the BLM may authorize BMM to proceed with the specific mining activities that would affect the historic property after:

   a. the fieldwork phase of the treatment option has been completed; and,

   b. the BLM has accepted a summary description of the fieldwork performed and a reporting schedule for that work; and,

   c. BMM has posted a surety acceptable to the BLM as stipulated in I. below for post-fieldwork costs of the treatment plan.

H. Time Frames

1. Inventory: The BLM shall review and comment on the results of any cultural resources inventory submitted by BMM within the time frames indicated in the BLMs *Cultural Resources Inventory General Guidelines* (4th edition, January 1990) or any subsequent edition issued by the BLM.

2. Consultation: The BLM shall submit the results of all identification and evaluation efforts, including discovery situations, and treatment plans to the SHPO, COUNCIL and interested persons for a 30-day concurrent review and comment period. If the SHPO, COUNCIL or interested persons do not respond to the BLM within 30 days of receipt of a submittal, the BLM shall presume concurrence with the BLMs findings and recommendations as detailed in the submittal. The concurring party, BMM, will be apprised by the BLM as to the status of these efforts.

3. Reports: A draft final report of all identification, evaluation, treatment or other mitigative activities will be due to the BLM within 9 months after the completion of the fieldwork associated with the activity, unless otherwise negotiated. The concurring party, BMM, will be apprised by the BLM as to the status of the draft reviews.

4. Curation: All records, photographs, maps, field notes, artifacts, and other materials collected or developed for any identification, evaluation, or treatment activities will be curated in a facility approved by the BLM at the time the final report associated with that activity is accepted by the BLM, unless materials and artifacts must be returned to the owner.

I. Surety Bonds

1. BMM will post a surety with the BLM in an amount sufficient to cover all post-fieldwork costs associated with implementing a treatment plan or other mitigative activities, as negotiated by BMM where they contract for services in support of this Agreement. Such costs may include, but are not limited to post-field analyses, research and report preparation, interim and summary reports preparation, public interpretation, and the curation of project documentation and artifact collections in a BLM-approved curation facility. The surety shall be posted prior to BLM issuing a notice to proceed.

2. The surety posted shall be subject to forfeiture if the post-fieldwork tasks are not completed within the time period established by the treatment option selected; provided, however, that the BLM and BMM may agree to extend any such time periods. The BLM shall notify BMM that the surety is subject to forfeiture and shall allow BMM 15 days to respond before action is taken to forfeit the surety.

3. The surety shall be released, in whole or in part, as specific post-fieldwork tasks are completed and accepted by the BLM.

J. Dispute Resolution

1. If the SHPO issues an objection regarding a matter submitted by the BLM for review, the BLM shall consult with the SHPO to resolve the objection. If then, either party determines that the objection cannot be resolved, the BLM shall request the comments of the COUNCIL. The COUNCIL shall provide its comments, if any, within 30 days after receipt of the request from the BLM. Any COUNCIL comment provided in response to such a request will be taken into account by the BLM and the BLM will notify the COUNCIL and SHPO of its decision. The BLMs responsibility to carry out all actions under this Agreement that are not the subject of the dispute will remain unchanged.

2. If an objection is raised by a representative of local government, or a member of the public, the BLM shall take the objection into account and consult as needed with the objecting party and the SHPO in an attempt to resolve the objection. If the BLM determines that the objection cannot be resolved, it shall request the comments of the COUNCIL. The COUNCIL shall provide its comments, if any, within 30 days after receipt of the request from the BLM. Any COUNCIL comment provided in response to such a request will be taken into account by the BLM and the BLM will notify the COUNCIL, SHPO and objecting party of its decision. The BLMs responsibility to carry out all actions under this Agreement that are not the subject of the dispute will remain unchanged.

K. Amendment

Any party to this Agreement may request that this Agreement be amended, whereupon the parties will consult in accordance with 36 CFR 800.13 to consider such amendment.

L. Termination

Any party to this Agreement may terminate the Agreement by providing thirty (30) days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of a termination, the BLM will comply with 36 CFR 800.4 through 800.6 with regard to individual actions covered by this Agreement.

M. Execution

1. Execution and implementation of this Agreement evidences that the BLM has afforded the COUNCIL a reasonable opportunity to comment on the Undertaking and its effects on historic properties and that BLM has satisfied its Section 106 responsibilities for all individual actions associated with the development of the Bald Mountain Mine District.

2. In the event that the BLM does not carry out the requirements of this Agreement, the BLM shall comply with 36 CFR 800.4 through 800.6 with regard to individual actions covered by this agreement.

3. This agreement shall become effective on the date of the last signature below, and shall remain effective, unless earlier terminated as provided in Stipulation L, until the later of a date of 10 years from the effective date or until the development of the Bald Mountain Mine District, including all exploration, mining, and reclamation, is complete.

CONSULTING PARTIES:

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: Robert D. Bush Date: 12/15/95

Title: Executive Director

BUREAU OF LAND MANAGEMENT

By: ________________ Date: 10/19/95

Title: Ely District Manager

NEVADA STATE HISTORIC PRESERVATION OFFICER

By: Alice M Baldrica, deputy for Date : 11/21/95

Title: State Historic Preservation Officer

CONCURRING PARTY:

PLACER DOME U.S., INC

By: ________________ Date : 10/16/95

Title: Manager

APPENDIX A

Bald Mountain Mining District

The Bald Mountain Mining District comprises the cultural resource review area for the purposes of this Programmatic Agreement. The cultural resource review area consists of all lands within the boundaries depicted on the attached Figure 1. The parties agree that Figure 1 shall be amended from time to time as may be necessary to include any additional properties or mining interests BMM may acquire for development of mineral resources within the Bald Mountain Mining District.

The parties acknowledge the property owned or controlled by BMM is comprised of scattered patented mining claims within contiguous and noncontiguous unpatented mining and mill site claims on public land administered by the BLM. These claim areas comprise the Bald Mountain Mining District as depicted on Figure 1.

APPENDIX B

Sequential Planning

The Area of Potential Effect (APE) encompasses identified historic properties, not all of which need to be dealt with immediately upon the initiation of a specific mineral development project. Therefore, for those identified historic properties, a general schedule of events for evaluating and treating those properties is outlined. Timing of appropriate evaluation and treatment of historic properties will occur in advance of proposed development activities and future exploration activities as described in the BLM-approved BMM Plans of Operations (POOs).

A. For BMM POOs exploration and development activities occurring on lands (regardless of surface ownership) within the BMMD that have been previously inventoried:

1. BMM shall notify the BLM prior to initiating activities which may affect a property or properties determined eligible or potentially eligible for the NRHP. Potential effects to properties will be determined by the BLM.

2. Upon receipt of a notification regarding potentially eligible properties, BLM will require that an evaluation program, which may include subsurface testing, be approved by the BLM and implemented by BMM, and that a report assessing eligibility be prepared. Eligibility recommendations presented in the report shall be reviewed by the BLM, in consultation with the SHPO to determine eligibility.

3. Upon receipt of a notification regarding properties that have already been determined to be eligible, the BLM will, in consultation with the SHPO, interested persons and BMM, select a treatment option.

4. Where fieldwork is required by the treatment plan, BLM may issue BMM a Notice to Proceed (NTP) with mining operations in the activity area after:

    a. the fieldwork phase of the treatment plan has been completed;

    b. a summary of the fieldwork has been accepted by BLM; and,

    c. BMM has provided a surety for post-fieldwork costs acceptable by BLM as stipulated in I.

B. For activities amended to BMM POOs, proposed to occur on lands (regardless of ownership) within the BMMD that have not been previously inventoried:

1. BMM shall retain a qualified archaeologist, historian or architectural historian meeting the Secretary of the Interior's *Professional Qualification Standards* (36 CFR 61) and acceptable to the BLM to conduct an inventory and report the results to the BLM.

2. The BLM, in consultation with the SHPO, shall review the inventory report for the APE of an activity area and shall determine if it contains cultural resources eligible for inclusion in the NRHP (36 CFR 800.4).

3. If no cultural resources are identified, the BLM may authorize BMM to proceed in the APE of the activity area and notify SHPO and any interested persons of BLMs decision to authorize the activity per 36 CFR 800.4(d).

4. If, after consultation with the SHPO, the cultural resources in the APE of an activity area are determined not eligible for inclusion on the NRHP, the BLM may authorize BMM to proceed in the APE of that activity area per 36 CFR 800.4(d).

5. For any historic properties identified in the APE of the activity area that are determined to be eligible to the NRHP, the procedures outlined in A.1 through 4 above will be followed.

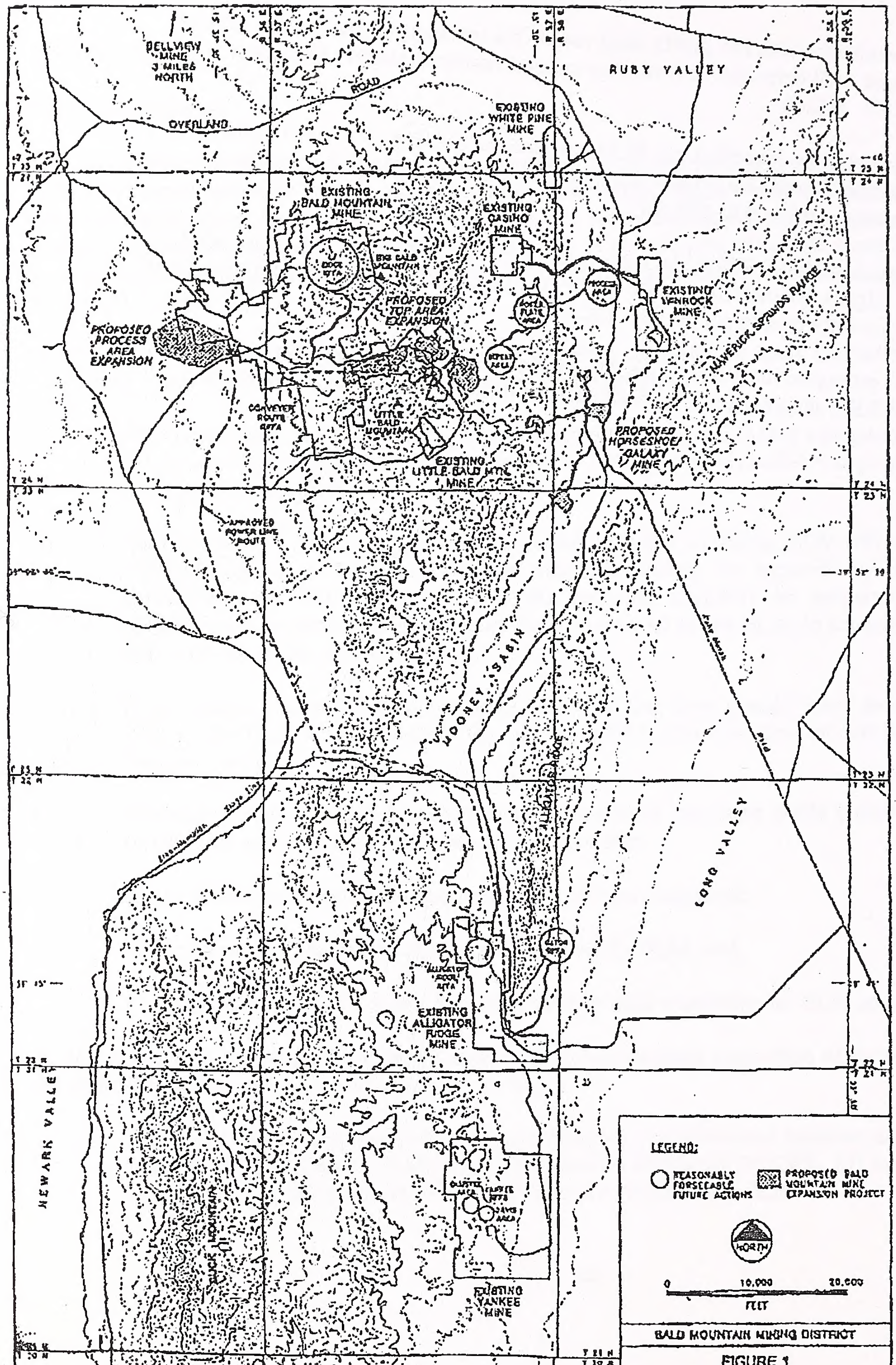

FIGURE 1
EXISTING, PROPOSED,