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Preliminary Environmental Assessment

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Amendment to the Mineral Ridge Mine Plan of Operations Environmental Assessment

Location:

Esmeralda County

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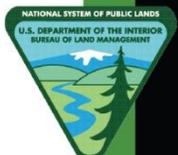


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LIST OF ACRONYMS AND ABBREVIATIONS

§	Character <i>signum sectionis</i> , used to refer to a particular section of a document
ACEC	Area of Critical Environmental Concern
amsl	Above mean sea level
APE	Area of potential effect
APoO	Amended Plan of Operations
ATV	All-Terrain Vehicle
BAPC	Bureau of Air Pollution Control
bgs	Below ground surface
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practice
BMRR	Bureau of Mining Regulation and Reclamation
C.F.R.	Code of Federal Regulations
CEQ	Council of Environmental Quality
CESA	Cumulative Effects Study Area
DOI	Department of the Interior
°F	degrees Fahrenheit
FONSI	Finding of No Significant Impact
E.O.	Executive Order
EA	Environmental Assessment
EIS	Environmental Impact Statement
<i>et al.</i>	Abbreviation for Latin phrase <i>et alii</i> , meaning ‘and others’, as in a list of names
<i>etc.</i>	Abbreviation for Latin phrase <i>et cetera</i> , meaning ‘and the rest’
FLPMA	Federal Land and Policy Management Act
ft	Feet
GIS	Geographic Information System
GPMI	Golden Phoenix Minerals, Inc.
HDPE	high density polyethylene
HMA	Herd Management Area
<i>i.e.</i>	Abbreviation for Latin phrase <i>id est</i> , meaning ‘that is’ or ‘in other words’
in	inches
in/hr	inches per hour
kWh/m ²	Kilowatt hours per square meter
MBTA	Migratory Bird Treaty Act
MDB&M	Mount Diablo Baseline & Meridian
MSHA	Mine Safety and Health Administration
MOU	Memorandum of Understanding
MRG	Mineral Ridge Gold, LLC
MRR	Mineral Ridge Resources, Inc.
MSDS	Material Safety Data Sheet
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory

NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NV	Nevada
OHV	Off-highway vehicle
PMU	Population Management Unit
PVC	Polyvinyl chloride
R	Range
RDF	Rock Disposal Facility
RECO	Renewable Energy Coordination Office
RFFA	Reasonably Foreseeable Future Actions
RMP	Resource Management Plan
RC	Reverse circulation
ROD	Record of Decision
ROW	Right-of-Way
R&PP	Recreation and Public Purposes Act
SHPO	State Historic Preservation Office
T	Township
TBD	To be determined
THPO	Tribal Historic Preservation Officer
U.S.	United States
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
VRM	Visual Resource Management
W/m ²	Watts per square meter
Wh/m ²	Watt hours per square meter
WPCP	Water Pollution Control Permit
WRCC	Western Regional Climate Center

1.0 INTRODUCTION

Mineral Ridge Gold, LLC (MRG) is the operator for the Mineral Ridge Mine authorized under N-73109. The mine is located about five miles northwest of the town of Silver Peak in Esmeralda County, NV. This area is approximately equidistant from Reno to the north and Las Vegas to the south, and is approximately 30 miles southwest of Tonopah and 20 miles from the California border. The general location of the project in relation to Silver Peak is shown on Figure 1. The proposed project is located on private and public lands; the latter area is administered by the Bureau of Land Management (BLM), Tonopah Field Office.

MRG is proposing to amend the *Amended Plan of Operations/Permit for Exploration NVN-73109/Reclamation Permit No. 0103* (Golden Phoenix Minerals Inc. (GPMI) 2003) to include exploration drilling and associated activities. The amended document is *Amendment to the Mineral Ridge Mine Plan of Operations (BLM Case No. NVN-73109 and BMRR Reclamation Permit No. 0103)* (SRK 2010) (APoO). This environmental assessment (EA) analyzes and discloses the potential environmental impacts associated with the proposed exploration activities.

The Mineral Ridge Mine was analyzed in the 1996 EA *Mineral Ridge Resources Incorporated Environmental Assessment NV65-EA96-24* (BLM 1996). This EA is tiered to the 1996 EA.

1.1 Purpose and Need for Action and Decision to Be Made (40 C.F.R. § 1502.13)

The BLM's purpose is to consider approval of the APoO for mining in Esmeralda County. The BLM needs to allow mining of resources while avoiding or minimizing impacts to other resources and the environment. Legitimate uses of public lands include the development of mineral resources as authorized under the Federal Land and Policy Management Act of 1976 (FLMPA) or other public land acts which meet the proponent's objective while preventing undue and unnecessary degradation. The BLM is required to comply with the National Environmental Policy Act (NEPA) to analyze the impacts that the Proposed Action and reasonable alternatives would have on the human environment.

The BLM's need, in review of the MRG APoO, is to ascertain whether MRG's Proposed Action would cause any undue or unnecessary degradation to public lands. If the BLM determines that any undue or unnecessary degradation would occur as a result of MRG's actions, the BLM would develop, through this EA, necessary stipulations, conditions of approval, or mitigation to limit or eliminate the potential unnecessary or undue degradation of public lands.

The Tonopah Field Manager's decision determines whether to: 1) approve MRG's APoO as submitted, 2) modify the APoO through necessary stipulations, conditions of approval, or mitigation developed through this EA, or 3) not approve MRG's APoO.

Exploration activities are authorized under the authority of, and in accordance with, Section 302(b) of FLPMA, 43 United States Code (U.S.C.) 1761.

An EA is a NEPA document that provides sufficient information on the potential impacts to the quality of the human environment to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). The EA allows for specialist review of affected resources, even if impacts are not significant, and also provides a mechanism for developing and identifying appropriate mitigation measures.

1.2 Scoping and Issues

An internal BLM specialist scoping meeting was held on April 23, 2010. The substantive issues identified during that discussion focused on potential impacts to wildlife and cultural resources. Potential impacts to cultural resources are addressed under Section 3.2 while potential impacts to wildlife are addressed under sections 3.4, 3.14, and 3.17 of this EA. Scoping included a joint site visit with the BLM staff, representatives of the Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation (NDEP) and the project proponent on May 28, 2010.

1.3 Land Use Plan Conformance Statement

The Proposed Action and the No Action Alternative are in conformance with the Tonopah Resource Management Plan (RMP) and Record of Decision (ROD), approved on October 2, 1997 (BLM 1997). "A total of 6,028,948 acres (99 percent of the Tonopah Planning Area) will be open to the operation of the mining laws," (page 23). The "BLM provides for mineral entry, exploration, location and operations pursuant to the mining laws in a manner that 1) will not unduly hinder the mining activities, and 2) assures that these activities are conducted in a manner which will prevent undue or unnecessary degradation of the public land," (page 35). "A Plan of Operations and a Reclamation Plan are required in situations in which there will be more than five acres of cumulative un-reclaimed surface disturbance in a Project Area," (page 35). "All operations shall comply with all Federal and State laws, including those relating to air quality, water quality, solid waste, fisheries, wildlife and plant habitat, and archeological and paleontological resources," (page 36). A copy of the RMP is available for review at the BLM Tonopah Field Office, 1553 S. Main Street, Tonopah, Nevada.

The BLM is responsible for administering access to mineral rights on certain federal lands as authorized by the General Mining Laws. Under the laws, qualified prospectors are entitled to reasonable access to mineral deposits on public domain lands which have not been withdrawn from mineral entry. The BLM is also responsible to review and approve exploration and mining activities on BLM-administered lands to protect surface resources pursuant to the FLPMA (43 U.S.C. 1701 et seq.) and the attendant regulations for surface management of lands on mining claims under the General Mining Laws (43 CFR 3809). The surface management regulations require the BLM to comply with the NEPA of 1969, as amended (42 U.S.C. 4321 et seq.) and ensure that the operator "conduct all operations in a manner that complies with all pertinent federal and state laws (43 CFR 3809.420) and will not cause undue and unnecessary degradation of the public lands".

On April 3, 1985, the Esmeralda County Board of Commissioners adopted a county policy plan for public lands under the Nevada Statewide Policy Plan for Public Lands authorized by Nevada Senate Bill 40. Nevada Senate Bill 40 directs the State Land Use Planning Agency to work together with local planning entities to prepare local plans and policy statements

regarding the use of federal land in Nevada. A revised plan for Esmeralda County is currently in draft form.

The BLM has prepared this EA in conformance with the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1500-1508) and the BLM NEPA Handbook H-1790-1. This EA: describes the Proposed Action, No Action Alternatives, and the Affected Environment; analyzes the environmental consequences of implementing the Proposed and No Action Alternatives; and includes mitigation measures to eliminate or reduce the expected consequences.

1.4 Relationship to Other Statutes, Regulations, and Plans

FLPMA was passed to authorize BLM's management of public lands. MRG proposes to undertake exploration drilling under the authority of FLPMA (43 U.S.C. §302(b)).

Relationships to other federal statutes, regulations, Executive Orders (E.O.) and plans include:

- American Indian Religious Freedom Act 1978 (42 U.S.C. 1996);
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa to 47011);
- Clean Air Act, as amended (42 U.S.C. 7401 *et seq.*);
- Clean Water Act of 1977 (33 U.S.C. 1251 *et seq.*);
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. 9615);
- Council on Environmental Quality (40 C.F.R. §1500);
- Eagle Protection Act (16 USC §668-668d);
- E.O. 11988, as amended, Floodplain Management, May 24, 1977;
- E.O. 11990, Protection of Wetlands, May 24, 1977;
- E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994;
- E.O. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001;
- Endangered Species Act of 1973, as amended (16 U.S.C. 1531);
- Magnuson-Stevens Act Provision: Essential Fish Habitat: Final Rule (50 CFR Part 600; 67 FR 2376, January 17, 2002)
- Migratory Bird Treaty Act of 1918, as amended (16 U.S.C 703 *et seq.*);
- National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*);
- National Historic Preservation Act, as amended (16 U.S.C. 470);
- Public Rangelands Improvement Act of 1978;
- Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901 *et seq.*);
- Safe Drinking Water Act, as amended (42 U.S.C. 300f *et seq.*);

- Surface Management (43 C.F.R. §3809 *et seq.*);
- Wild and Scenic Rivers Act as amended (16 U.S.C. 1271); and
- Wilderness Act of 1964 (16 U.S.C. 1131 *et seq.*).

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Location of the Proposed Action

The Project Area is accessed by traveling south on State Highway 265 to Silver Peak. Truck traffic to and from the Project Area uses a county road from State Route 264 via Fish Lake Valley (Hot Springs Road N-54397 and Rhyolite Ridge Road N-54403) and a county road from Silver Peak via the Blair town site (East Canyon Road N-51529). Light vehicles utilize the Coyote Road (N-62084) in addition to the two truck routes (Figures 1 and 2).

The proposed exploration activities depicted on Figure 3 would be located within the Project Area which includes portions of:

- T1S, R39E, SW¼ of Section 31;
- T1S, R38E, S½ of Section 36;
- T2S, R38E, all quarter sections of Section 1, E½ of Section 2, and N½ of Section 12; and
- T2S, R39E, all quarter sections of Section 6.

2.2 Description of Proposed Action and Alternatives (40 C.F.R. § 1502.12)

2.2.1 History

Mining began in the Mineral Ridge area in 1865 and has since experienced periods of exploration and mining as well as periods of inactivity. In July of 1993, Cornucopia Resources Ltd. (Cornucopia) entered into a mining lease on the Mary and Drinkwater claims with the Mary Mining Trust and in May, 1995 entered into an option agreement with Benguet Corp. USA on the Oromonte claims. From July, 1993, Cornucopia conducted extensive exploration and development programs on the Mineral Ridge Property through its wholly-owned subsidiary Mineral Ridge Resources Inc. (MRRI).

The property was acquired by Vista Gold in 1998. The general operating plan is assumed to have included increased placement of ore on the pads, albeit at a somewhat lower grade, and mining of both ore and waste with large equipment. The Vista operation ran less than a year and failed, reportedly from a combination of excessive ore dilution, improperly sized equipment, and lack of capital.

GPMI purchased the property in 2000 from the Vista Chapter 11 bankruptcy trustee. GPMI began operations in January, 2004 and operated the mine through December, 2004. Drain down and rinsing of the heap ran into 2005. The site was in temporary closure from 2005 until February, 2011 when crushing of oversized ore left on the pad by previous operators commenced. Leaching of the ore and carbon column operations resumed in March, 2011. Mining of new ore began on June 1, 2011.

2.2.2 Existing Authorizations

The Project Area consists of about 1,040 acres of which 546 acres are privately owned by MRG and 494 acres are public land administered by the BLM. Facilities associated with the project include:

- five open pits (Mary North, Mary South, Drinkwater, Wedge B, and Brodie);
- two underground workings (Wilson Decline and Mary Portal);
- eight rock disposal facilities (RDF) (WD-1, WD-2, WD-3, WD-4, WD-5, WD-7, WD-8, and WD-9);
- crushing and agglomeration facilities;
- heap leaching facilities including barren and pregnant solution ponds;
- haul and access roads;
- one clay and soil borrow pit;
- a utility corridor; and
- office, shop, warehouse, and ancillary facilities including water supply wells and pipelines, ore stockpiles, a fuel farm, a 69-kilovolt (kV) power line and substation, step-down transformers, site distribution electrical lines, a ready line, stormwater diversions and controls, a septic system, explosives storage area, and a Class III waived landfill.

Three of the five open pits (Drinkwater, Wedge B, and Brodie) were operated between 1996 and 1999. The Wedge B open pit is now partially backfilled and used as the crusher stockpile area; however, additional ore remains in the highwalls. Figure 2 illustrates the area of operations, facility layout, and current disturbance. Table 1 presents the authorized surface disturbance for the Mineral Ridge Mine.

Table 1: Authorized Disturbance

Description	Public (BLM)	Private	Total
Crusher/Conveyor	0.88	3.09	3.97
Diversion Ditches	0.14	0.10	0.24
Growth Med. Stockpiles	2.42	1.94	4.36
Haul Roads "Large"	9.14	13.52	22.66
Roads "Light Duty"	6.73	2.9	9.63
Laydown Areas	7.02	11.76	18.78
Leach Pad	23.91	14.45	38.36
Borrow Pit	2.99	0.52	3.51

Description	Public (BLM)	Private	Total
Pits	0.74	86.13	86.87
Plant Site	0.00	3.77	3.77
Security Areas	1.23	0.00	1.23
Sediment Traps	0.06	0.06	0.12
Solution Pond	2.93	0.35	3.28
Stockpile (existing)	0.00	4.86	4.86
Substation	0.00	0.08	0.08
WD-1	28.71	11.22	39.93
WD-2 & -3	0.00	0.00	0.00
WD 4	1.82	6.58	8.4
WD-5 & -9	0.04	21.03	21.07
WD-7	10.14	7.87	18.01
WD-8	0.00	6.94	6.94
Water Option "A"	0.00	0.23	0.23
Water Option "B"	0.23	0.00	2.23
Total	99.13	197.4	296.53

Source: Reclamation Permit No. 0103, May 1, 2003

Authorizing documents for the existing activities and facilities are:

- *Mineral Ridge Resources Incorporated Environmental Assessment*. NV65-EA96-24. Mineral Ridge Mine. June 18, 1996. Casefile # N65-96-001P; and
- *Finding of No Significant Impact and Decision Record for Mineral Ridge Project, Esmeralda County*. Environmental Assessment NV65-EA96-024. Casefile # N65-96-001P;
- *Mary Drinkwater Exploration Project Reclamation Permit*. Casefile #N-0034; and
- *Mineral Ridge Mine Reclamation Permit*. Casefile #N-0103.

2.2.3 Proposed Action

MRG proposes to undertake the following activities as part of the APoO:

- Create up to 35 acres of exploration activity surface disturbance primarily on public lands including constructing drill roads and pads;
- Install a cellular phone extender system;

- Install vadose zone monitoring wells;
- Update the fuel farm;
- Expand the existing laboratory; and
- Relocate a portion of power line.

Exploration activity proposed by MRG consists of a drilling program primarily on public land within the existing Project Area. A total of up to 330 drill holes are proposed within five main centers of exploration: Bluelite; Custer; Echo-Eagle Canyon; Northwest Brodie; and Solberry. Of these, 79 sites would be located on existing bonded disturbance. Up to 35 additional acres would be disturbed equaling approximately three percent of the Project Area. Under previous authorizations approximately 297 acres of disturbance were approved. The total disturbance area, including previously authorized and the currently proposed, would be approximately 332 acres or approximately 32 percent of the Project Area. The proposed activities are shown on Figure 3.

If initial drilling in an area does not indicate the presence of economic gold reserves, exploration activities would be suspended; as such, not all the holes would be drilled. Table 2 summarizes the proposed drilling activity.

Because exploration is an iterative endeavor, the exact number of drill sites and the precise locations within each area for each of the drill roads and drill sites, are not known at this time. Drill holes may be located at wider spacings initially, and depending on the results, more closely spaced holes may be drilled. Future locations for drill sites would be selected in response to the results obtained from previous exploration efforts and with consideration for protected resources and consultation with the BLM.

Table 2: Summary of Drilling Activity

Area	Number of Holes	Approximate Hole Spacing (feet)
Bluelite	138	50
Custer	31	150
Echo-Eagle	60	50 and 100
Northwest Brodie	94 ¹	50
Solberry	7	150

¹ Includes four holes on private land

Reverse circulation (RC) and diamond core drill rigs would be utilized. Drill rigs would be track-mounted, truck-mounted, and buggy-mounted depending on the access and terrain of the site. Drill hole depths may reach up to 1,000 feet below ground surface (ft bgs), and rod sizes used could include HQ sizes 2.5, 4.5, and 5.58 inches. Drill pads for track- and buggy-mounted rigs would be approximately 100 feet by 30 feet (0.07 acre) while truck-mounted drill rigs would be approximately 100 feet by 50 feet (0.11 acre).

Two drill rigs would be operated at one time supported by a 2,000-gallon water truck, a D-8 class dozer as needed, a service truck, a track hoe such as a 225-335 size, and a light vehicle. Other equipment may be used as necessary. A 2,000-gallon high density polyethylene (HDPE) tank and plastic pipe would be used to provide water to the drill rigs to prevent water trucks from having to access steep roads; this tank and piping would be supplied by the

drilling contractor. Sumps measuring approximately ten feet by four feet with a depth of five feet (for an approximate volume of 0.005 acre-feet) or smaller would be constructed within the footprint of the drill pad. Final sump dimensions would be designed to meet the estimated required capacity of drill fluids and cuttings with one foot of freeboard. Sumps would be fenced until backfilled after completion of drilling. Casings would be pulled, and the holes closed as described below. Up to four holes (three RC and one core hole) may be left open at a time to facilitate the movement of equipment between holes for sampling purposes. Holes would be closed within 60 days according to NAC 534.4371.

Water would be supplied by the mine's production wells. Well PW-1 is the production well currently in use under permit number 60036. Wells WW94001 and WW94003 (permit number 60034 for both), are located approximately 1.2 miles from the mine area in Clayton Valley and may be used as production wells if needed. MRG also currently holds permit number 60035 which is assigned to a non-existent well located in Township 1 South, Range 39 East, Section 29. Existing well locations are shown on Figure 4.

Drill pads located on previously disturbed areas have not been calculated as disturbance and drill pads located partially on previously disturbed areas have been calculated to disturb half of their original size. Disturbance calculations for drill holes spaced on 50-foot centers accommodates two drill holes per drill pad.

Where no prior access exists, access routes with an approximate 15-foot running surface would be established. New exploration road construction would be accomplished with a D-8 class dozer and a trackhoe/excavator as needed. Growth media would be stockpiled for reclamation in or adjacent to the fill slope. Overland travel, without blading, would be used where practical and safe.

If necessary, a contract explosives firm may be used to blast areas of rock outcrop; MRG would ensure public safety and site safety by blocking potential access roads and conforming to Mine Safety and Health Administration (MSHA) standards. Efforts to minimize surface disturbance would be implemented when overland travel occurs.

MRG would provide site inspection of drilling operations and road construction on a daily basis. This includes on-site inspections of the operation as well as phone or radio contact with the drilling crews to determine if problems are encountered. Sites would be examined to ensure that cultural sites, wetlands, springs, seeps, and drainages are avoided.

Existing roads used for access would be reclaimed at the completion of future exploration and mining activities in the Project Area. Maintenance required may include watering the roads (utilizing MRG or contractor's water trucks) and treating the roads with a diluted lignin sulfonate organic binder prior and during use to prevent undue degradation. Treatment of the roads would primarily be done near the administrative building and in the process area. Vehicles traveling the roads would range from four-wheel drive pickups to drill rigs and support equipment.

MRG would provide an activity update to the BLM and NDEP, which would include road and pad construction, drilling, and reclamation, on an annual basis. The report would be submitted by April 15th of each year.

The proposed activities would result in approximately 35 acres of new disturbance from overland access, new road construction, and construction of drill pads as outlined in the table

below. Existing access roads and overland access to drill sites would be used wherever possible. Table 3 provides a general breakdown of the disturbance.

Table 3: Approximate Proposed Disturbances in Acres

Feature	Description	Dimensions	Acres ¹
Drill Road	18,233 feet	15-foot running width	6.3
Drill Site	330 sites ²	100 feet by 50 feet	28.8
Total	-	-	35.1

¹ Acres are based off of the SRCE calculations and include sloped acres.

² Does not include 79 sites on existing disturbance that are already bonded leaving 251 drill sites.

2.2.3.1 Other Modifications

Proposed Cellular Phone Extender System

Since little to no cell phone service was available within the Project Area on public lands, a cellular phone extender system has been installed as shown on Figure 3. The system consists of three components: a donor dish; an operating module; and a site antenna. The donor dish is made of a wire mesh grid array and is mounted approximately 36 inches off the ground on a two-inch diameter rigid steel pole set in concrete. The operating module is the device used for sending and receiving cellular signals between the donor dish and the site antenna and consists of electronics and a battery pack in weatherproof housing set on an existing two by two-foot square concrete pad. The site antenna is a 36-inch tall by 12-inch wide antenna mounted on a three-inch rigid steel pole set in concrete. The three components are connected by a one-inch armored coaxial cable that lies on the ground. Power to the system is provided by insulated electrical wiring from the administration building. Surface disturbance related to this system is limited.

Monitoring Wells

A vadose zone monitoring plan was requested by the NDEP, through the Water Pollution Control Permit (WPCP) renewal process as a condition for restarting of heap leaching activities at the Mineral Ridge Mine. The plan calls for three monitoring wells drilled at an angle to intercept potential seepage from the heap or process pond.

The three monitoring wells (VZM-01, VZM-02, and VZM-03) are constructed from four-inch PVC and are set at angles ranging from 60 to 70 degrees. They are located on previously disturbed ground; their locations are shown on Figure 3. Their total depths are approximately 525 feet for wells VZM-01 and 02, and 479 feet for well VZM-3.

Fuel Farm

An engineering design change (EDC) was submitted to NDEP regarding the design, construction, operation, and closure of new fueling and oil stations. The EDC was approved with the condition that prior to construction of the new facility, the NDEP-approved *Final Plan for Permanent Closure* and required mitigation for the existing fuel area be completed. The NDEP conditions were met and construction of the fuel farm and oil station completed. The new fuel station is located where the old fuel station was located next to and north of the

wash down pad. The oil station is located on the north side of the truck shop on WD-8 as shown on Figure 3. The fuel and oil stations are located on previously disturbed ground.

The new fueling station consists of two 10,000-gallon, double-wall steel tanks with 110 percent containment capacity. The tanks are installed on an eight-inch reinforced concrete pad which measures 40 feet by 32 feet. The pad is graded to drain to the existing wash down pad, which drains to the existing settling pool and overflows to the oil skimmer.

The new oil station consists of three double-wall steel tanks, each with 110 percent containment capacity. Two 1,000-gallon tanks are used for the storage of motor oil and hydraulic fluid, and the 500-gallon tank is used for used motor oil. The tanks are installed on an eight-inch thick reinforced concrete pad, and each tank stores one type of petroleum product. The concrete pad measures 16 feet by 14 feet. Each tank has its own dedicated delivery system inside the truck shop. No change in fuel or oil usage has occurred.

Laboratory Expansion

Expansion of the laboratory consists of the addition of approximately 66 cubic yards of concrete as foundation on previously disturbed ground for a new fire assay area, flatwork area, air-handling pad, sample preparation pad, and footings for a dust collection system. The proposed areas are adjacent to the existing laboratory and are on previously disturbed ground. MRG would utilize fire assay techniques in place of hot cyanide leach to determine the gold content in samples. The fire assay technique uses lead which remains in the cupels at the end of the fire assay process. These cupels would be handled as hazardous waste according to MRG's hazardous waste management plan.

Power Line Relocation

As mining progresses into the proposed Mary Pit, it would become necessary to relocate the existing power line within the Project Area. The proposed route has been reviewed and approved by NV Energy, and is shown in Figure 3, along with the existing route. Most of the pole locations would be located on previously disturbed ground. MRG would contract with NV Energy to construct the relocation, which would be conducted in accordance with existing power line standards. The new power line route would be approximately 4,900 feet long and would replace a section of the old power line which is approximately 3,800 feet long.

2.2.3.2 Reclamation

Reclamation of the proposed exploration disturbance would be consistent with the *Amended Plan of Operations/Permit for Exploration NVN-73109/Reclamation Permit No. 0103* (GPMI 2003) and the APoO.

To the extent practical, exploration roads and drill sites would be recontoured to approximate the original shape of the ground and the adjacent topography that existed prior to construction operations. Exploration roads, drill sites, and sumps would be backfilled and recontoured using a CAT 320-type excavator or other suitable-sized excavator. Soil material that is placed in road fill during construction would be replaced (backfilled) into the road cuts and on drill sites by the excavator. The final surface of backfilled sites would be left in rough condition to hold seed and optimize germination, and the recontoured roads and drill sites would be seeded. After seeding, equipment-accessible slopes would be chain harrowed to lightly cover the seed.

If gold resources are not located, exploration activities would cease; the post-exploration land use would revert back to the original land uses. Major land uses in the Project Area include livestock grazing, wildlife habitat, mineral exploration, and recreation.

Reclaimed areas would be hand- or broadcast-seeded with the seed mix provided in Table 4; changes and/or adjustments to the seed mix and/or application rate may be made upon approval.

MRG would monitor revegetation success and the presence of noxious weeds on an annual basis until project release. Weed control would be performed by MRG during the appropriate season to eradicate infestations, if necessary.

Table 4: BLM Recommended Reclamation Seed Mixtures

Common Name	Scientific Name	Broadcast Application Rate ¹
Indian rice grass	<i>Oryzopsis hymenoides</i>	2.00
Streamband wheatgrass	<i>Agrpyron riparium</i>	2.25
Sandberg bluegrass	<i>Poa secunda</i>	0.25
Palmer penstemon	<i>Penstemon palmeri</i>	0.25
Basin sagebrush or black sagebrush	<i>Artemisia tridentata</i>	2.00
Mormon tea	<i>Ephedra nevadensis (viridis)</i>	2.00
Fourwing saltbush	<i>Atriplex canescens</i>	2.00
Shadscale	<i>Artiplex confertifolia</i>	4.00
Galleta grass	<i>Hilaria jamesii</i>	2.00
Total		16.75

¹ Pure live seed

2.2.4 Schedule

Exploration activities associated with the Proposed Action are anticipated to begin upon authorization and continue for ten years. Concurrent reclamation would take place where practicable. Drill pads and roads would be reclaimed in accordance with NRS 519A.285, and final reclamation would initiate once drilling has been completed. The following schedule of activities is proposed:

- 3rd quarter 2011 Drilling would begin
- 3rd quarter 2021 Drilling would end
- 4th quarter 2021 Concurrent reclamation would conclude

2.2.5 Additional Environmental Protection Measures

The standard operating procedures that would be used by MRG over the project life incorporate best management practices (BMPs).

Air Quality

Air emissions, including point and fugitive sources, would continue to be controlled in accordance with the air quality operating permits for the project and would be controlled in accordance with present BMPs. For example, dust control would be provided for roads through water or a diluted organic binder application. The proposed organic binder is a lignin

sulfonate (DusTreat DC9112T) that would be applied at a rate of 0.25 gallons per square yard together with a small amount of surfactant (DusTreat DC9140E). Treatment of the roads using the organic binder would occur primarily near the administrative building and process area.

Cultural Resources

Avoidance is the MRG-preferred treatment for preventing effects to historic properties (an historic property is any prehistoric or historic site eligible to the National Register of Historic Places (NRHP)) or unevaluated cultural resources. Site area borders would be staked and/or flagged with buffer areas as needed. If avoidance is not possible or is not adequate to prevent adverse effects, MRG would undertake data recovery at the affected historic properties in consultation with the BLM, Nevada State Historic Preservation Office (SHPO), and the advisory Council on Historic Preservation. Development of a treatment plan, data recovery, archeological documentation, and report preparation would be based on the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*, 48 CFR 44716 (September 29, 1983), as amended or replaced. If an unevaluated site cannot be avoided, additional information would be gathered, and the site would be evaluated. If the site does not meet eligibility criteria as defined by the SHPO, no further cultural work would be performed. If the site meets eligibility criteria, a data recovery plan or appropriate mitigation would be completed and approved. Once data recovery has been completed at a historic property, the BLM would issue a Notice to Proceed for work at that location.

Public Safety

The exploration areas are not frequently visited by the public. However, active sumps would be flagged for visibility and fenced after completion of drilling until they are filled in. Existing roads would not be blocked by drilling equipment.

Water Quality

Drilling activity would be kept to a minimum distance of 100 feet from drainages, seeps, or springs that are actively flowing. Access across drainages, seeps, and springs would be avoided where possible. If required, culverts, rolling dips, armoring, and/or straw bales would be utilized to protect drainages. Where drainage crossings cannot be avoided, culverts sized for the 100-year, 24-hour storm event would be placed as necessary where roads cross local drainages.

The mobile equipment on the site would utilize diesel fuel and lubricant. The drill rigs and other mobile equipment would be serviced by a fuel truck. Spills of hydrocarbons would be managed according to the *Emergency Response Plan* submitted to the NDEP as part of the Mineral Ridge WPCP application (#NEV0096106).

Materials and equipment necessary for spill cleanup would be kept in the warehouse as discussed in *Emergency Response Plan*. Equipment and materials would include, but not be limited to, brooms, dust pans, rags, gloves, goggles, sorbent materials, sand, sawdust, and plastic/metal trash containers specifically for this purpose. Many of these materials would also be located on operational vehicles to mitigate releases or spills in the field during the exploration program.

Well-maintained equipment would be used to perform the work required during this Project. When practicable, equipment maintenance would be performed off-site. In the event of oil,

fuel, lubricating grease, or other equipment leaks, cleanup would be conducted as soon as possible. If the leak is on compacted soil, an oil-absorbing product, such as Absorb®, may be applied. Once the cleanup product has absorbed the leak, the product would be swept up into watertight drums or bins, labeled, stored, and disposed of according to state and federal regulations. If the leak occurs on uncompacted soil, the contaminated soil would be removed, managed, and disposed of at an off-site facility in compliance with state and federal regulations. In either case of compacted and uncompacted soils, soils would be “loosened” and removal of soil would occur to the depth required to capture the contaminated soils or materials. Notifications to appropriate agencies would be undertaken as described in the site *Emergency Response Plan*.

MRG would conduct exploration operations so as to minimize soil erosion. Equipment would not be operated when ground conditions are such that excessive rutting or increased sediment transport would occur. Following construction activities and in accordance with the BLM requirements, areas adjacent to surface disturbance upon which growth media has been placed would be seeded as soon as practical and safe. Concurrent reclamation would be conducted to accelerate stabilization of disturbed areas.

Road construction and drainage operations are governed by the provisions of the Plan and the General Stormwater Permit, NVR 300000 and the site *Stormwater Pollution Prevention Plan*. Roads would be designed to the minimum standards needed to accommodate intended safe use and to maintain surface resource protection. Exploration roads would generally be constructed along existing contours. Exploration road construction would be conducted in such a manner as to minimize cuts and fills, including limiting road construction on steep slopes, where possible.

Accepted engineering practices/BMPs for sediment control would be employed during construction, operation, and reclamation to minimize sedimentation of disturbed areas. Sediment control structures may include, but are not be limited to, fabric and/or certified weed-free straw bale filter fences, siltation or filter berms, mud sumps, and down-gradient drainage channels in order to prevent unnecessary or undue degradation to the environment. Sediment traps (sumps), constructed as necessary adjacent to drill sites, would be used to settle drill cuttings and prevent release. In order to control erosion from roads and drill sites, and from the unlikely event of drill cuttings being released, certified weed-free straw bales and silt fences would be placed in drainages to capture sediment, where required.

Drainage structures would be constructed or installed where necessary to prevent or minimize erosion and sedimentation. Drainage structures may consist of, but not be limited to, water bars, borrow ditches, contour furrows, and culverts sized to handle maximum seasonal water flows.

Sumps for drill water, fluids, and cuttings would be excavated within the limit of the drill site. Anticipated sump dimensions would be about ten feet by four feet by five feet deep or smaller. Final sump dimensions would be designed to meet the estimated required capacity of drill fluids and cuttings with one foot of freeboard. One end of each sump would be sloped to provide an escape route in the event an animal enters the sump. Sumps would be fenced after completion of drilling until backfilled.

Mineral exploration and development drill holes subject to Nevada Division of Water Resources (NDWR) regulations would be abandoned in accordance with Nevada Revised Statutes (NRS) 534.425 through 428.

Wildlife and Vegetation

To minimize impacts to wildlife and plant resources within the Project, MRG would utilize existing access and exploration roads to the maximum extent possible. In addition, new surface disturbance would be kept to the minimum that is required to provide safe equipment access and crew working areas at each drill site. Disturbed areas would be reclaimed by recontouring and revegetating at the earliest practical time upon the completion of exploration operations. If necessary, MRG, in coordination with the BLM, would implement measures to avoid or protect special status plant or wildlife species that could potentially be impacted by the proposed Project.

Land clearing and surface disturbance would be timed to prevent destruction of active bird nests or of young birds during the avian breeding season (March 1 through July 31) in accordance with the Tonopah Field Office policies and with the Migratory Bird Treaty Act (MBTA). If surface-disturbing activities are unavoidable, MRG would have a qualified biologist survey areas proposed for disturbance for the presence of active nests immediately prior to the disturbance.

If active nests are located, or if behaviors of nesting are observed (mating pairs, territorial defense, carrying nesting material, transporting of food), the area would be avoided using a BLM-approved buffer to prevent destruction or disturbance of nests until the birds are no longer present. Avian surveys would be performed only during the avian breeding season and immediately prior to MRG conducting activities that would result in disturbance. MRG would not conduct any additional disturbance during the avian breeding season without first conducting another avian survey. After July 31, in compliance with the Tonopah Field Office guidelines, no further avian surveys would be required until the next avian breeding season. Active raptor nests would not be removed as a result of exploration operations unless approved by the BLM or other appropriate agency.

Bald and golden eagles are protected under the *Bald and Golden Eagle Protection Act* (Act) (16 USC 668-688d). The Act prohibits the taking or possession of and commerce in bald and golden eagles, parts, feathers, nests, or eggs with limited exceptions. The definition of “take” includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available:

- Injury to an eagle;
- A decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or
- Nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior.

This definition also covers impacts that may result due to human activities to or around a nesting site during times when eagles are not present, if when the eagles return, the alternations or activities interrupt their normal breeding, feeding, sheltering, or cause death, or nest abandonment (USFWS 2010).

MRG's existing and proposed construction, operation, and reclamation procedures incorporate measures to protect eagles. Surveys would be conducted prior to ground disturbance in the breeding and nesting seasons to determine the presence or absence of eagles as well as other migratory avian species protected under the MBTA. If nesting or brooding eagles are determined to be present, MRG would avoid the area using a buffer zone developed in coordination with the BLM and Nevada Department of Wildlife (NDOW).

Project-related traffic would observe prudent speed limits, 25 mph or less, to minimize fugitive dust emissions, protect wildlife and livestock, and to enhance public safety.

Livestock and Range Allotments

MRG would protect fences, gates, stock ponds, and other range improvements within the Project. Gates would be closed and/or locked as appropriate.

Survey Monuments

Survey monuments, witness corners, and/or reference monuments would be protected to the extent economically and technically feasible. Should moving such a feature be required, MRG would ensure that a licensed Professional Land Surveyor oversees and executes the relocation in a manner consistent with applicable laws. The BLM would be notified in writing prior to the moving of any such survey monument.

Solid Wastes

Non-hazardous project-related refuse would be collected in approved trash bins or containers and removed from the site for disposal in accordance with county, state, and federal regulations. The bins and/or containers would be equipped with lids.

Hazardous Substances

Hazardous substances employed for the project would include diesel fuel, gasoline, hydraulic fluid, and lubricating grease. Approximately 100 gallons of diesel fuel and gasoline would be stored in fuel delivery systems on drill rigs and support vehicles. Approximately 50 pounds of lubricating grease and 35 gallons of hydraulic fluid would be stored on each drill rig or transported by drill trucks. Transportation of these materials would be conducted in accordance with applicable regulatory guidelines. Upon request, MRG or the contract driller would provide the BLM with Material Safety Data Sheets (MSDS) or equivalent safety information. The Mineral Ridge *Emergency Response Plan* contains a detailed description of the spill prevention and spill reporting procedures.

Used cupels from the fire assay process would be stored and disposed in accordance with federal, state, and local regulations and MRG's hazardous waste management plan.

Fire Prevention and Control

Reasonable measures to prevent fires within the project boundaries would be taken by employees, contractors, and subcontractors.

Smoking would only be permitted in areas that are free of flammable materials. Debris associated with smoking would be put into containers designed solely for this purpose and properly disposed.

Vehicles and equipment operated on BLM-administered public lands and roads would meet proper wildfire prevention requirements including, but not limited to approved spark arrestors, fire suppression tools, and other appropriate supplies. Mobile drilling equipment and support vehicles would be equipped with fire extinguishers and shovels during the exploration program. During welding operations, flammable materials would be cleared from within 20 feet of the welding operation and fire extinguishers and hand tools would be readily accessible to prevent fires.

During fire season, MRG would contact BLM Fire Dispatch to determine if any restrictions are in place in the Project Area. MRG acknowledges that MRG may be held liable for costs incurred to extinguish fires directly caused by MRG or its contractors.

Noxious Weed / Undesirable Plant Control

Employees and contractors would be educated to identify noxious weeds that could occur in the proposed disturbance areas. MRG would report occurrence of noxious weeds to the BLM authorized officer and take appropriate measures to prevent the spread of noxious weeds. BMPs include the following:

- Flagging areas of concern to prevent employees and contractors from driving through a stand of listed noxious weeds;
- Using certified weed-free hay and straw;
- Using an approved seed mix to reduce invasive species over time by developing and maintaining desired plant communities; and
- Washing down construction equipment in accordance with BLM standard operating procedures to prevent the transfer of noxious and undesirable weed seed from other areas.

Employee Training

MRG would train employees, contractors, and other related personnel as to the environmental and cultural resources responsibilities required under this Plan as well as state and federal law.

2.2.6 Alternatives to the Proposed Action (40 C.F.R. § 1502.14)

Other “action” alternatives are not required in an EA. Only the Proposed Action and No Action Alternative need to be addressed. Gold exploration is based on known and suspected mineral deposits. MRG would consider various methods of exploration such as core versus rotary drilling, tracked versus wheeled exploration drill rigs, and other viable alternatives to locate precious metal deposits. However, the Proposed Action is the most reasonable method to meet the objective of this EA while minimizing degradation to the environment. No alternatives other than the “No Action” alternative are analyzed in this EA.

2.2.6.1 No Action Alternative

3.0 UNDER THE NO ACTION ALTERNATIVE, THE PROPOSED ACTION WOULD NOT BE APPROVED BY THE BLM. MRG WOULD CONTINUE MINING UNDER THE EXISTING AUTHORIZATIONS. UNDER THE NO ACTION ALTERNATIVE, THE APPROVED DISTURBANCE OF 297 ACRES WOULD REMAIN; HOWEVER, NO NEW MINERAL RESOURCE DEPOSITS WOULD BE IDENTIFIED. MINING AND PROCESSING WOULD CONTINUE USING PREVIOUSLY IDENTIFIED ORE RESERVES AND RESOURCES. AFFECTED ENVIRONMENT (40 C.F.R. § 1502.15), ENVIRONMENTAL CONSEQUENCES (40 C.F.R. § 1502.16) AND PROPOSED MITIGATION OR AVOIDANCE MEASURES

This section describes the current status of supplemental authorities and resources that may be affected by either the Proposed Action or No Action Alternative.

The topography in the area of the mine is typical of that found in the Basin and Range Physiographic Province of the western United States. Data concerning existing (i.e., baseline) conditions and resource trends were obtained from: previous studies; published sources; unpublished materials; interviews with representatives of local, state, and federal agencies; and/or field observations.

The NEPA is only one of many authorities that contain procedural requirements that pertain to treatment of elements of the environment when the BLM is considering a federal action. To comply with NEPA and these supplemental authorities, the BLM mandates that all EAs address specific elements of the environment that are subject to requirements specified in statute, regulation, or by Executive Order. Table 5 outlines the supplemental authorities that must be addressed in all EAs and whether or not the Proposed Action potentially affects those elements.

Table 5: Supplemental Authorities to be Considered

Element	Not Present	Present, But Not Affected	Present and Potentially Affected	Rationale for Inclusion or Exclusion
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Element	Not Present	Present, But Not Affected	Present and Potentially Affected	Rationale for Inclusion or Exclusion
Air Quality			•	Air quality would be affected by combustion pollution as well as fugitive emissions related to land disturbance; carried forward for further analysis. See discussion in Section 3.1.
Areas of Critical Environmental Concern (ACEC)	•			There are no ACECs within the area of the Proposed Action.
Cultural Resources			•	Land clearing and disturbance would occur potentially affecting cultural resources; carried forward for further analysis. See discussion in Section 3.2.
Environmental Justice	•			No minority or low-income population would be disproportionately affected by the Proposed Action.
Farm Lands (prime or unique)	•			No prime or unique farmlands are located within the area of the Proposed Action.
Fish Habitat	•			No fish habitat is located within the area of the Proposed Action.
Floodplains	•			No flood zones have been identified by the Federal Emergency Management Agency for the Project Area.
Human Health and Safety			•	Human health and safety may be affected; carried forward for further analysis. See discussion in Section 3.3.
Migratory Birds			•	The Project Area provides habitat for migratory birds; carried forward for analysis. See discussion in Section 3.4.
Native American Religious Concerns			•	Information sharing with tribal representatives is ongoing; carried forward for analysis. See discussion in Section 3.5.
Noxious Weeds, Invasive & Non-native Species			•	Potential for invasive and nonnative species in the area; carried forward for analysis. See discussion in Section 3.6.
Threatened or Endangered Species	•			There are no threatened or endangered species within the Project Area. Although potential habitat may occur for threatened and endangered species, no individuals or sign were observed during baseline biological surveys.
Waste, Hazardous or Solid			•	Hazardous materials would be used as part of the Proposed Action and solid and hazardous wastes created; carried forward for analysis. See discussion in Section 3.7.

Element	Not Present	Present, But Not Affected	Present and Potentially Affected	Rationale for Inclusion or Exclusion
Water Quality Drinking/Ground			•	Activities under the Proposed Action have the potential to affect water resources; carried forward for analysis. See discussion in Section 3.8.
Wetlands/Riparian Zones	•			No wetland/riparian zones are located within the area of the Proposed Action.
Wild and Scenic Rivers	•			No wild and scenic rivers are located within the area of the Proposed Action.
Wilderness	•			No designated wilderness or wilderness study areas are located within the area of the Proposed Action.

Source: H-1790-1 National Environmental Policy Act Handbook: Appendix 1 Supplemental Authorities to be Considered (BLM, 2008).

Supplemental authorities (elements) determined to be Not Present or Present/Not Affected need not be carried forward for analysis or discussed further in the document. Elements determined to be Present and Potentially Affected must be carried forward for analysis.

In addition to the resource elements outlined in Table 5, the BLM considers other resources that occur on public lands, or issues that may result from the implementation of the Proposed Action. These additional resources are outlined in Table 6.

Table 6: Additional Resources Considered for Analysis

Resource	Not Present	Present, But Not Affected	Present and Potentially Affected	Rationale for Inclusion or Exclusion
Grazing Management			•	The Project Area of the Proposed Action is within the Silver Peak grazing allotment and some loss of vegetation is anticipated; carried forward for analysis. See discussion in Section 3.9.
Land Use Authorization			•	Two rights-of-way exist within the Project Area; carried forward for analysis. See discussion in Section 3.10.
Minerals			•	The Project Area is located on patented and unpatented mining claims; carried forward for analysis. See discussion in Section 3.11.

Resource	Not Present	Present, But Not Affected	Present and Potentially Affected	Rationale for Inclusion or Exclusion
Paleontological Resources	•			The Project Area is located in Precambrian period strata. Algal mats as well as body and trace fossils have been identified in the middle member of the Precambrian Deep Springs Formation at other locations. They have not been identified at this location but may be present. The western access road from the Coyote Springs road goes through the Campito, Poleta, and Harkless formations known to contain Cambrian period fossils; no known index or significant Cambrian fossils have been identified at this location. The Proposed Action is not anticipated to affect significant paleontological resources.
Recreation			•	Dispersed recreation is present in the area; carried forward for analysis. See discussion in Section 3.12.
Soils			•	Soils in the Project Area would be affected by the proposed activities; carried forward for analysis. See discussion in Section 3.13.
Special Status Species including Eagles			•	There is the potential for various special status species to occur within the Project Area; carried forward for analysis. See discussion in Section 3.14.
Vegetation			•	Vegetation would be removed under the Proposed Action; carried forward for analysis. See discussion in Section 3.15.
Visual Resources		•		Proposed Action is in visual resource management Class IV which allows for major modifications to the landscape. This Proposed Action will not degrade the existing visual character of the area.
Wild Horses and Burros			•	Proposed Action is located within the Silver Peak Herd Management Area; carried forward for analysis. See discussion in Section 3.16.
Wildlife			•	Wildlife habitat would be removed or altered under the Proposed Action; carried forward for analysis. See discussion in Section 3.17.
Socioeconomic Values		•		Proposed Action would minimally alter workforce numbers at the Mineral Ridge Mine; temporary drill crews would consist of three to four people.

The following sections describe the supplemental authority elements and additional resources of the human environment that are present and may be potentially affected by the Proposed Action.

3.1 Air Quality

3.1.1 Affected Environment

Air quality in the Project Area is governed by pollutant emissions and meteorological conditions. Wind speeds, mixing heights, and stability affect the circulation, distribution, and dilution of emissions in the area. Esmeralda County is considered “unclassifiable/attainment” (40 C.F.R. § 81.329 Nevada). An unclassified area is one for which insufficient ambient air quality data are available, and the area may be above or below ambient standards.

Unclassified areas are managed as attainment areas. An attainment area is one that does not exceed national ambient air quality standards.

Current emission sources within the existing Project Area include vehicles, crushing and screening facilities, conveyors, adsorption/desorption plant within the process plant, and fugitive dust from travel on unimproved roads.

3.1.2 Environmental Consequences of the Proposed Action

Most air quality impacts would be transitory and temporary, limited in duration, and would essentially end at the completion of the exploration activities. Fugitive dust related to disturbed lands would continue until those lands had been successfully revegetated according to the *Amended Plan of Operations/Permit for Exploration NVN-73109/Reclamation Permit No. 0103* (GPMI 2003) and the APoO.

Fugitive dust and equipment emissions would be insignificant. The estimated area of disturbance associated with implementation of the Proposed Action would be up to 35 acres in addition to the 297 acres already approved for disturbance. Some disturbance of previously disturbed lands has or would occur related to the monitoring wells, and fuel farm installation as well as the laboratory expansion and power line relocation. The Proposed Action would result in direct, temporary impacts to air quality from fugitive dust as well as gaseous pollutants such as nitrous oxides, carbon monoxide, and sulfur dioxide. Sources of gaseous pollutants would include exploration equipment exhaust emissions, including mobile equipment such as drill rigs and light vehicles. Sources of fugitive dust would include land clearing, earth moving, travel on unimproved roads, and wind erosion of disturbed lands.

3.1.2 Environmental Consequences of the No Action Alternative

No change to the air quality in the area would occur beyond impacts related to permitted activities.

3.1.3 Proposed Mitigation or Avoidance Measure

MRG would implement measures to reduce potential impacts to air quality such as watering main roads and other high-use areas to control fugitive dust, and preventive equipment maintenance to control vehicle emissions.

3.2 Cultural Resources

3.2.1 Affected Environment

Historic properties that are significant in history and culture are recognized by both the state and the federal governments as resources to be preserved and interpreted for the benefit of all citizens. They are non-renewable resources that are important to our individual and collective identity, and they are worthy of protection, investigation, interpretation, and conservation.

All federally funded, permitted, or assisted projects in Nevada must be in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), and its implementing regulations in (36 C.F.R. § 800.4). This Act ensures that historic and cultural resources are identified, and potential impacts can be evaluated so that appropriate mitigation measures can be developed, as necessary.

A total of 13 prior cultural resources investigations have been conducted within one mile of the area of potential effect (APE) which includes the Mineral Ridge Project Area, the Coyote Road to the west, and East Canyon Road to the west. Of these 13 investigations, ten were conducted completely or partially within the current APE. These include eight Class III inventories, one treatment plan for eligible sites within the Mineral Ridge survey area, and the results of the mitigation of effects to those eligible sites. The entire survey area was inventoried for cultural resources in 1996. With the exception of very small segments, the access roads were inventoried for cultural resources under multiple projects (Kautz 2010).

During the prior cultural resources investigations, a total of 117 archeological sites were recorded and evaluated for the NRHP within one mile of the current APE. These 117 sites consisted of both prehistoric and historic sites. The historic sites include components related to the town site of Blair, elements of the Mineral Ridge Historic Mining District, and historic components with unknown associations. Of the 117 previously recorded sites, 87 fall within the current APE. These sites were recorded between 1987 and 1996 and include 57 sites originally determined not to be eligible for the NRHP, 27 sites determined to be eligible, and three sites that remain unevaluated for the NRHP (Kautz 2010).

In the late 1990s, Mineral Ridge Resources of Silver Peak, Nevada proposed to conduct mineral extraction activities within the survey area. Consequently, a treatment plan to mitigate project effects to the eligible sites was developed. The treatment included avoidance and additional mapping of some resources, and data recovery efforts at other sites including intensive artifact recordation, collection, trenching, and excavation. Archival research and photography were also conducted for those sites determined to be eligible for the NRHP under Criterion A. A total of 26 sites were directly treated (Kautz 2010).

The report documenting the results of the mitigation program produced in 1998 was not formally reviewed by SHPO. However, the treatment protocols proposed in the treatment plan and accepted by SHPO were followed; therefore, the mitigation is considered adequate. The mitigated sites can be separated into three categories:

- Those sites at which photo-documentation and data recovery including artifact recordation, trenching, and hand excavation units were conducted;
- Those sites which were avoided; and

- Those sites which were mapped but yielded no additional work because no additional work was determined to be necessary.

Sites previously recorded more than ten years ago and not mitigated have to be re-evaluated for eligibility to the NRHP if ground-disturbing activities could disturb them. Of the 66 archeological sites previously recorded within the survey area, 30 sites remain that need to be re-evaluated and possibly mitigated before they could be disturbed. Of those 30 sites, six have the potential to be disturbed by the Proposed Action. Those sites would be avoided. A 25-meter buffer would be established around those sites and a qualified cultural resource monitor would be present when development is occurring near the buffers to ensure that the sites are avoided.

The monitoring wells, and fuel farm installation as well as the laboratory expansion have or would occur on previously disturbed lands. Pole locations for the proposed power line reroute were specifically reviewed for cultural resources. The pole locations were found to be on disturbed or surveyed areas without cultural resources.

3.2.2 Environmental Consequences of the Proposed Action

The proposed drilling locations have the potential to impact six previously recorded archeological sites: (CrNV-64-8621, -8624, -8644, -8645, -8697, and -8698). Drill pads and roads located within avoidance areas identified by cultural resource specialists would be relocated to avoid impacting these sites, with consideration taken for the 25-meter buffer areas. The number or drill holes of associated disturbance acreage would not be altered. No impacts to cultural resources related to the power line reroute are expected to occur.

3.2.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the proposed project would not be developed and impacts to cultural resources related to the Proposed Action would not occur.

3.2.4 Proposed Mitigation or Avoidance Measure

Avoidance of identified sites is the BLM-preferred treatment for preventing effects to historic properties (a historic property is any prehistoric or historic site eligible to the NRHP) or unevaluated cultural resources. Sites eligible for the NRHP would be avoided according to BLM requirements. If avoidance is not possible, or is not adequate to prevent adverse effects, MRG would undertake data recovery at the affected historic properties.

If an undocumented site is located during operations as described above, the BLM would make proper notifications to the appropriate entities (SHPO, Tribes) and a qualified cultural resource specialist would evaluate the find. If the resource is determined to be eligible for nomination to the NRHP, the BLM would propose actions to resolve adverse effects. Such procedures would be in accordance with current applicable laws, regulations, and agreements. No activity in the vicinity of the discovery would resume until a Notice to Proceed has been issued by the Authorized Officer. Should the resource be determined not eligible for nomination the NRHP, no further work may be required and project activity in the vicinity may resume once a notice to proceed has been issued by the Authorizing Officer.

Should cultural resources, human remains, items of cultural patrimony, sacred objects, or funerary items be discovered during project activities, all activities within 100 meters of the

discovery would be halted. The BLM Authorized Officer would be notified of the find, and the discovery appropriately protected.

If an unevaluated site cannot be avoided, additional information would be gathered and the site would be evaluated. If the site does not meet eligibility criteria, as defined by the SHPO, no further cultural work would be performed. If the site meets eligibility criteria, a data recovery plan or appropriate mitigation would be completed.

3.3 Human Health and Safety

3.3.1 Affected Environment

The Project Area is located on 546 acres of private land controlled by MRG and 494 acres of public land administered by the BLM. The public lands within the Project Area are open to but not frequently used or accessed by the public. Recreation in the area is limited and dispersed as described in Section 3.12 *Recreation* of this document. Access routes to the Mineral Ridge Mine are gated; however, exploration activities are occurring in adjacent areas, some of which can be accessed from outside the Mineral Ridge Mine boundary.

3.3.2 Environmental Consequences of the Proposed Action

Under the Proposed Action, the presence of equipment and vehicles would increase within the exploration areas and to some degree on the Mineral Ridge Mine access roads. No additional areas would be fenced to restrict public access. Installation of the cell phone extender, monitoring wells, and fuel farm as well as the laboratory expansion and power line relocation has or would occur within the active mining area to which public access is restricted. Considering the extent of the proposed activities, and avoidance measures to be implemented by MRG, potential impacts to human health and safety are considered to be low.

3.3.3 Environmental Consequences of the No Action Alternative

No impacts related to human health and safety would occur as a result of the No Action Alternative.

3.3.4 Proposed Mitigation or Avoidance Measure

MRG would follow safety measures to minimize potential effects to human health and safety. Public safety would be maintained throughout the life of the project, including relevant safety measures in the exploration areas and safe handling and use of the lignin sulfonate and surfactant for dust suppression. Equipment and other facilities would be maintained in a safe and orderly manner. Project-related traffic would observe prudent speed limits to enhance public safety. Activities would be conducted in conformance with applicable federal and state health and safety requirements. If blasting is necessary, access roads leading to the blasting area would be blocked by manned equipment and/or earthen berms in accordance with MSHA regulations.

3.4 Migratory Birds

3.4.1 Affected Environment

Migratory birds are protected the MBTA which prohibits the taking of migratory birds, their parts, nests, eggs, and nestlings. Migratory birds may be found in the area of the Proposed Action as either seasonal residents or as migrants. Table 7 provides an inventory of bird species (including migratory birds) which may occur in the Project Area. Some of these birds are also listed as special status species and are further described in Section 3.14 *Special Status Species*.

Table 7: Inventory of Bird Species Potentially Occurring Within the Study Area

Common Name	Scientific Name	Common Name	Scientific Name
Turkey vulture	<i>Cathartes aura</i>	Violet-green swallow	<i>Tachycineta thalassina</i>
Golden eagle	<i>Aquila chrysaetos</i>	Pinyon jay	<i>Gymnorhynchus cyanocephalus</i>
Northern harrier	<i>Circus cyaneus</i>	Black-billed magpie	<i>Pica hudsonia</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>	Common raven	<i>Corvus corax</i>
Ferruginous hawk	<i>Buteo regalis</i>	Rock wren	<i>Salpinctes obsoletus</i>
American kestrel	<i>Falco sparverius</i>	Blue-gray gnatcatcher	<i>Poliophtila caerulea</i>
Prairie falcon	<i>Falco mexicanus</i>	Mountain bluebird	<i>Sialia currucoides</i>
Peregrine falcon	<i>Falco peregrinus</i>	Hermit thrush	<i>Catharus guttatus</i>
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Loggerhead shrike	<i>Lanius ludovicianus</i>
Chukar	<i>Alectoris chukar</i>	Sage thrasher	<i>Oreoscoptes montanus</i>
Mourning dove	<i>Zenaida macroura</i>	Solitary vireo	<i>Vireo solitarius</i>
Short-eared owl	<i>Asio flammeus</i>	Yellow-rumped warbler	<i>Dendroica coronata</i>
Long-eared owl	<i>Asio otus</i>	Wilson's warbler	<i>Wilsonia pusilla</i>
Great horned owl	<i>Bubo virginianus</i>	Spotted towhee	<i>Pipilo maculatus</i>
Burrowing owl	<i>Athene cunicularia</i>	Lark sparrow	<i>Chondestes grammacus</i>
Common poorwill	<i>Phalaenoptilus nuttallii</i>	Black-throated sparrow	<i>Amphispiza bilineata</i>
Common nighthawk	<i>Chordeiles minor</i>	Sage sparrow	<i>Amphispiza belli</i>
Black-chinned hummingbird	<i>Archilochus alexandri</i>	Brewer's sparrow	<i>Spizella breweri</i>
Western wood-pewee	<i>Contopus sordidulus</i>	Western meadowlark	<i>Sturnella neglecta</i>
Say's phoebe	<i>Sayornis saya</i>	Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Gray flycatcher	<i>Empidonax wrightii</i>	Western tanager	<i>Piranga rubra</i>
Horned lark	<i>Eremophila alpestris</i>	Vesper Sparrow	<i>Pooecetes gramineus</i>

3.4.2 Environmental Consequences of the Proposed Action

Under the Proposed Action up to 35 acres of potential migratory bird habitat may be removed or altered due to overland access and the construction of access roads and drill pads. The disturbance of 35 acres would result in disturbance of approximately three percent of the Project Area. While some loss of migratory bird habitat may occur during the construction of roads and drill pads, MRG would be required to follow the prescriptive criteria described in

Section 2.2.5 *Additional Environmental Protection Measures*. Some disturbance of previously disturbed lands has or would occur related to installation of the monitoring wells, and fuel farm as well as the laboratory expansion and power line relocation.

Anti-perching devices would be added to power poles to protect birds from electrocution. Installation of the cell phone extender is not anticipated to impact migratory birds. The lignin sulfonate proposed for dust suppression use on the roads would be applied at 0.25 gallons per square yard. At this dilution, the biodegradable and non-toxic binder and the small amount of associated surfactant would not adversely affect wildlife. Considering the size and the temporal nature of the proposed disturbance, the existing disturbance, and avoidance measures proposed by MRG, impacts to migratory bird populations would be negligible.

3.4.3 Environmental Consequences of the No Action Alternative

No adverse consequences associated with the No Action Alternative are anticipated beyond the impacts related to previously approved activities.

3.4.4 Proposed Mitigation or Avoidance Measure

MRG proposes to conduct breeding bird surveys in the proposed exploration areas prior to disturbance between March 1 and July 31. If necessary, avoidance of occupied nests using a BLM-approved buffer would be instituted as described in Section 2.2.5 *Additional Environmental Protection Measures*.

3.5 Native American Religious Concerns

3.5.1 Affected Environment

The Mineral Ridge Mine lies within the traditional territory of the Western Shoshone. Various tribes and bands of the Western Shoshone have stated that federal projects and land actions can have widespread effects to their culture and spiritual beliefs as they consider the landscape as sacred and as a provider. Sites and resources considered sacred or detrimental to the continuation of tribal traditions include, but are not limited to: prehistoric and historic village sites; sources of water (hot and cold springs); pine nut gathering locations; sites of ceremony and prayer; archaeological sites; burial locations; “rock art” sites; medicinal/edible plant gathering locations; areas associated with creation stories; or any other tribally designated traditional cultural property. Specific locations in Mineral Ridge Mine area have not been identified or shared. However, this does not mean they do not exist. Future Native American consultations in the area may reveal such sites, activities, or resources.

3.5.2 Environmental Consequences of the Proposed Action

Considering the specific location and description of the project, the Proposed Action does not appear to compromise the integrity of traditional, spiritual, cultural or ceremonial use areas. The Proposed Action would occur on the steep slopes of Mineral Ridge which have been heavily disturbed by historic and recent mining activities.

Vehicles, equipment, and personnel used for exploration purposes can have negative impacts to areas utilized by native peoples and their associated artifacts. Long- and short-term noise and visual impacts can have a detrimental impact to existing cultural/traditional/spiritual

activities that may occur in certain areas. Sacred areas such as prayer sites, sweat lodges, and vision quest sites, along with edible/medicinal plant gathering sites and activities, must remain quiet and undisturbed.

The physical remains of past cultural and subsistence practices and activities (antelope traps, points, flakes, stone tools, grinding stones, etc.) are also considered to be extremely important and sacred due to such artifacts having been made by the ancestors and considered the evidence of thousands of years of native inhabitation. Drilling, drill pad, access route construction, and personnel working in close proximity to cultural sites can destroy artifacts, thus eliminating not only the physical evidence of native occupation, but also archaeological data, which can produce a better understanding of past and present cultures. Archaeological data along with native oral history can reveal information pertaining to past cultural activities and associated social practices, trade routes, subsistence activities, environmental changes, etc. Cultural resources are discussed further in Section 3.2.

Exploration roads leading to drill sites, although intended to be temporary and reclaimed, often experience further use by members of the public to access formerly inaccessible locations. If members of the general public increasingly utilize former drill roads, the cultural/traditional/spiritual integrity of adjacent Native American use may be compromised.

Also, the act of drilling exploration holes (regardless of the data being sought) is often viewed by traditional practitioners and believers as being harmful to “mother earth” due to impacts to underground and surface waters, which are considered the “lifeblood of the Earth and all who dwell upon it.” Other than consumption by people, wildlife, and plant species, certain hot and cold spring locations are also used for healing and spiritual purposes.

3.5.3 Environmental Consequences of the No Action Alternative

There would be no change to the Native American concerns under the No Action Alternative as the proposed drill pads and access roads would not be constructed.

3.5.4 Proposed Mitigation or Avoidance Measure

The Project Area has been surveyed for cultural resources for previous projects and significant cultural sites were avoided or mitigated. Data from the previous surveys has been re-evaluated for the Proposed Action. Of the 66 archeological sites previously recorded within the Mineral Ridge survey area, 30 sites remain that need to be re-evaluated. Of those 30 sites, six have the potential to be disturbed by the Proposed Action. None of the sites are prehistoric or ethnohistoric sites. All of these sites would be avoided by drilling activities.

During the project exploration activities, drilling crews and other support personnel would be informed that if any cultural properties, items, or artifacts (stone tools, projectile points, etc.) are encountered, such items are not to be collected. Cultural and archaeological resources are protected under the Archaeological Resources Protection Act (16 USC 470ii) and FLPMA (43 USC 1701). The above language is applicable to previously identified artifacts and site locations, surface artifacts possibly missed during the original survey, and subsurface artifacts (below ground).

Though the possibility of disturbing Native American grave sites within most Project Areas is extremely low, inadvertent discovery procedures must be noted. The Native American Graves Protection and Repatriation Act, Section (3)(d)(1) states that the discovering individual must

notify the land manager in writing of such a discovery. If the discovery occurs in connection with an authorized use, the activity which caused the discovery is to cease and the materials are to be protected until the BLM can respond to the situation.

3.6 Noxious Weeds, Invasive & Non-native Species

3.6.1 Affected Environment

A noxious weed survey was performed by SRK Consulting in June, 2010 and no noxious weeds, as identified by Nevada Administrative Code (NAC) 555.010 were observed on the site. Non-native species cheatgrass (*Bromus tectorum*) and halogeton (*Halogeton glomeratus*) were observed alongside and within disturbed areas.

3.6.2 Environmental Consequences of the Proposed Action

Under the Proposed Action approximately 35 acres of land would be disturbed, creating favorable conditions for the establishment of noxious, invasive, and non-native plant species. The disturbance of 35 acres equals approximately three percent of the Project Area. Some use of previously disturbed land has or would occur related to installation of the monitoring wells, fuel farm, the laboratory expansion, and power line relocation. Favorable conditions for the establishment of the aforementioned types of plants would remain until successfully revegetated according to the *Amended Plan of Operations/Permit for Exploration NVN-73109/Reclamation Permit No. 0103* (GPMI 2003), the APoO, and described in Section 2.2.3.2 *Reclamation* is successful. The establishment of noxious, invasive, and non-native species could change the plant community from complex to more simple over time, competing with native plants for pollinators, nutrients, water, and space. A change in plant community could have an effect on the overall ecology of the area.

Considering the size of the proposed disturbance under the Proposed Action, the absence of noxious weeds, the low amount of the non-native species halogeton and cheatgrass, and environmental protection measures proposed by MRG, impacts related to invasive and non-native noxious weeds are considered low.

3.6.3 Environmental Consequences of the No Action Alternative

No further impacts are projected from invasive and non-native noxious weeds under the No Action Alternative beyond impacts related to previously authorized activities.

3.6.4 Proposed Mitigation or Avoidance Measure

MRG would work with the BLM to prevent the spread of invasive and nonnative species in the area affected by the exploration activities. Employees and contractors would be educated to identify weeds that could occur in disturbed areas. Should invasive weeds be identified, MRG would take appropriate measures to eradicate them. BMPs would include: training personnel and contractors to identify non-native and invasive species; flag areas where they may occur to prevent disturbance and spread of seed; seeding growth media stockpiles with native seed; using certified weed-free hay and straw; and using a BLM-approved seed mix to reduce invasive species over time on disturbed areas and during reclamation.

3.7 Waste, Hazardous or Solid

3.7.1 Affected Environment

A Class III waived landfill is located within RDF WD-4 as shown on Figure 2. A Class III waived landfill was previously located in the Brodie Pit but has been closed and is no longer in use. Fuels are stored within secondary containment at the fuel farm located near the truck shop and oil is stored at the oil station.

The new fuel station is located where the old fuel station was, next to and north of the wash down pad. The oil station is located on the north side of the truck shop on WD-8 as shown on Figure 2. The new fuel station consists of two 10,000-gallon, double-wall steel tanks with 110-percent containment capacity.

The new oil station consists of three double-wall steel tanks (two 10,000-gallon and one 500-gallon), each with 110-percent containment capacity. The tanks are installed on an eight-inch thick reinforced concrete pad and each tank stores one type of petroleum product. The products to be stored are motor oil, hydraulic fluid, and used oil.

Expansion of the laboratory would not change the current material usage or waste production of the facility with the exception of used cupels. These cupels would be handled in accordance with federal, state, and local regulations.

3.7.2 Environmental Consequences of the Proposed Action

Hazardous and solid waste associated with the Proposed Action would be managed by MRG in the same manner that hazardous and solid waste is currently managed at the Mineral Ridge Mine. Pursuant to 43 C.F.R. § 8365.1-1(b)(3), no sewage, petroleum products, or refuse would be dumped in the area of the Proposed Action. Refuse generated during the project would be removed and disposed in the Class III waived landfill, consistent with applicable regulations. Hazardous materials and wastes would be disposed of at licensed facilities by licensed contractors. Spills of hazardous materials including petroleum products would be cleaned and reported according to state and federal regulations within the required timeframes. Both BLM and NDEP would also be notified of spills and completion of cleanup within the required timeframes.

Installation of the cell phone extender, monitoring wells, and the power line relocation would not result in particular impacts related to hazardous or solid waste. In general, wastes which may be created as part of construction activities would be handled in the same manner as other wastes created onsite. Construction of the updated fuel farm and oil station has improved MRG's petroleum management and containment capabilities. Given compliance with applicable state and federal regulations, and the existence of current management practices, potential impacts from the Proposed Action related to hazardous or solid waste are considered low. The Proposed Action would have a positive impact to the environment by providing more robust containment for hazardous materials.

3.7.3 Environmental Consequences of the No Action Alternative

No additional impacts related to hazardous or solid waste under the No Action Alternative are projected.

3.7.4 Proposed Mitigation or Avoidance Measure

No mitigation or avoidance measures are proposed beyond the measures previously described relating to compliance with state and federal regulations.

3.8 Water Quality

3.8.1 Affected Environment

The Project Area is located within NDWR Central Region (Hydrographic Region 10), within the Clayton Valley Hydrographic Basin (basin number 143). The western side of the Project Area lies near the border of two other hydrographic sub-basins: Big Smoky Valley-Tonopah Flat (area 137) and Fish Lake Valley (area 117). The Project Area and hydrographic sub-basins are shown on Figure 4.

The majority of the groundwater recharge within the Mineral Ridge Mine area and the adjacent valleys occurs as precipitation, mainly snow in the mountains. Groundwater discharge occurs as flow from springs and evapotranspiration. On the western end of Clayton Valley groundwater diversions include municipal uses by the town of Silver Peak and mining purposes by Chemetall Foote Corporation. Water rights also exist in the area for domestic, irrigation, and stock watering purposes (NDWR 2010a).

The regional groundwater flow consists of interbasin flow directed from north to south and northeast to southwest. The regional flow systems occur within fractured bedrock and volcanic units, and unconsolidated to consolidated basin-fill sediments and alluvium. The perennial yield of the Clayton Valley hydrographic sub-basin has been estimated at 20,000 acre feet per year (NDWR 2010b).

Evaluation of baseline data from springs and production well inspections provided further information on the site hydrology. The localized flow system underlying the Project Area is characterized by groundwater movement eastward from the Silver Peak Range to the alluvial basin of Clayton Valley (Hydro-Search 1996). In Clayton Valley, production wells, evaporation ponds, and evapotranspiration consume the shallow groundwater.

During previous mineral exploration conducted by MRRI, a temporary groundwater flow of 20 gallons per minute from a perched water zone was encountered in borehole MR95385 at a depth of 540 to 565 ft bgs. This site became production well PW-1 (permit number 60036) and has a collar elevation of approximately 7,065 feet above mean sea level (ft amsl). As drilling continued, the water production dropped off until significant water was encountered at a depth of approximately 900 ft bgs (GPMI 2002). A measurement taken in January of 2010 indicated a static water level of 1,025 ft bgs.

The deepest drill hole in the leach pad area was drill hole GW-19-86, drilled to depth of 545 feet; no groundwater was encountered (WESTEC 1995). Two monitoring wells WW94001 and WW94003 (permit number 60034 for both), located approximately 1.2 miles from the mine area, had static water levels of 720 ft bgs and 818 ft bgs respectively as measured after drilling in 1994. The wells have collar elevations of approximately 5,270 ft amsl. Test borehole WW-98A (also referred to as DH-98001) located to the west of the heap leach facility, had a static water level of approximately 1,059 ft bgs as measured after drilling in

1998. Permit number 60035 is currently assigned to a non-existent well located in Township 1 South, Range 39 East, Section 29. Existing well locations are shown on Figure 4.

Testing and analyses were performed by WESTEC to determine the average vertical permeability of the alluvium and underlying bedrock in the heap leach facility area. The testing consisted of both constant and falling head permeability tests. In areas where core drilling was used, constant head packer tests were conducted at various depths during drilling activities. When using either auger or reverse circulation drilling techniques, standpipes were set at various elevations within the alluvium or bedrock and falling-head permeability tests were conducted. Permeability results ranged from 2.9×10^{-5} cm/sec to 7.9×10^{-3} cm/sec across a range of ten feet to 92.5 feet below the ground surface. No groundwater was encountered during the WESTEC drilling and test pit program (WESTEC 1995).

3.8.1.1 Surface Hydrology

Six drainages are located within one mile of the Project Area: Great Gulch; Custer Gulch; Echo Canyon; Eagle Canyon; Eagle Nest Canyon; and New York Canyon. Each of these drainages is ephemeral, flowing east into Clayton Valley. The drainages are shown on Figure 5. Evapotranspiration exceeds precipitation during most of the year near the Mineral Ridge Mine area, so stream flows are ephemeral and of short duration. New York, Echo, and Eagle canyons flow only during significant storm events (Hydro-Search 1996).

Two springs are located within a one-mile radius of the Project Area: Tarantula Springs (SP-5) and Borgo Springs (SP-4), shown on Figure 5. Hydro-Search measured the flow at Tarantula Spring in 1995 to be less than one gallon per minute while Borgo Spring was not flowing (Hydro-Search 1996).

3.8.1.2 Surface Water Quality

A baseline hydrological study was carried out in 1996 by Hydro-Search (Hydro-Search 1996) within a five-mile radius study area centered on the Mineral Ridge Mine area. Of the 18 identified springs in the study area, 15 were inspected, and samples were collected from ten, as shown on Figure 5. Many of the springs had historically been used for stock watering purposes, as potable water sources, or for mining water supply. At the time of the 1996 baseline study, Minnesota Spring (SP-1), Macaroni Spring (SP-2), North Spring (SP-3), and SP-13 were still being used for stock watering. The different use category standards and water quality results for the surveyed springs are included in Appendix A.

Minnesota Spring, Macaroni Spring, Valcalda Spring (SP-8), SP-11, and SP-13 met or exceeded state and federal standards established for drinking water, irrigation, and livestock.

North Spring, SP-7, and SP-14 generally met or exceeded state and federal standards established for drinking water, irrigation, and livestock with the exceptions of iron and aluminum.

Coyote Spring (SP-9) generally met or exceeded state and federal standards established for drinking water, irrigation, and livestock with the exceptions of iron, aluminum, sulfate, and total dissolved solids.

Tarantula Spring generally met or exceeded state and federal standards established for drinking water, irrigation, and livestock with the exceptions of total dissolved solids, sulfate, and magnesium.

3.8.2 Environmental Consequences of the Proposed Action

Up to 330 drill holes are included in the Proposed Action which may reach depths of up to 1,000 ft bgs. Well PW-1 recorded the depth to water as 1,280 feet in February 1998. Test borehole WW-98A had a static water level of approximately 1,059 feet bgs measured in 1998. A measurement of PW-1 taken in January of 2010 indicated a static water level of 1,025 feet bgs. Groundwater elevations generally follow the topography. Based on the proposed locations for the core holes and their expected depth of 1,000 feet or less, the probability of the core holes intersecting the groundwater aquifer are low.

An average of 1,375 gallons of water per shift would be used to drill the exploration holes. RC rigs would normally operate one shift per day and core rigs would normally operate two shifts per day for a combined average total of approximately 4,125 gallons per day (gpd). The amount of water for fugitive dust control is expected to be 750 gpd. The amount of water for drilling and fugitive dust control, assuming 330 core holes are drilled over a period of ten years, is 5.5 acre-feet per year (afy). Water would be supplied by the permitted production wells.

No other wells outside of the Mineral Ridge Mine would be impacted by the Proposed Action. Tarantula Spring is located 0.5 miles from and approximately 60 feet down-gradient from the closest production well PW-1. Tarantula Spring is fed by a perched water table located at the base of the Deep Springs formation. SP-1 accesses water from a granodiorite intrusion in the Wyman formation which is located below the Deep Springs formation and below a low angle thrust fault. The other production wells are located in Clayton Valley. The additional pumping of 5.5 afy from the supply well(s) for exploration is expected to have a minimal impact on the aquifer(s).

Activities under the Proposed Action would not be located in the vicinity of permanent surface water features. Sumps for drill water, fluids, and cuttings would be excavated within the limit of the drill site. Anticipated sump dimensions would be about ten feet by four feet by five feet deep or smaller. Final sump dimensions would be designed to meet the estimated required capacity of drill fluids and cuttings with one foot of freeboard.

Proper drilling methods would be used to prevent contamination of groundwater. Bentonite would be used to drill and plug holes. The polymer Poly-Plus 2000 would also be used to control loose materials encountered during drilling. Poly-Plus 2000 is approved under the U.S. Environmental Protection Agency Region IX General National Pollutant Discharge Elimination System permit which regulates offshore discharges of drilling fluids (Poly-Plus 2000 MSDS). In addition, the core holes would be cased and plugged as soon as possible, as specified in NAC 534.4371.

Up to 35 acres of land would be disturbed increasing the erosional potential; wind and water erosion of disturbed lands could impact ephemeral surface water features through increased sedimentation and nutrient loading. The disturbance of 35 acres equals approximately three percent of the Project Area. Some disturbance of previously disturbed land has or would occur

related to installation of the monitoring wells, fuel farm, the laboratory expansion, and power line relocation.

The lignin sulfonate proposed for dust suppression use on the roads would be applied at 0.25 gallons per square yard. The organic binder, together with a small amount of surfactant, would help to bind soil particles together thus stabilizing the soil and reducing water infiltration. At the recommended application rate of 0.25 gallons per square yard, the solution has been determined to be non-toxic and would not adversely affect surface water features if it were to wash off of the roads.

No direct impacts to surface water resources are anticipated from the Proposed Action. Indirect impacts could include an increased potential for sediment loading from increased erosion on disturbed lands. Given the relative size of the Proposed Action, its location in relation to surface water features, and the avoidance measures proposed by MRG, the potential impacts to surface water resources are considered low. Given the aforementioned factors and the depth to water within the Project Area, potential impacts to groundwater resources are considered low.

3.8.3 Environmental Consequences of the No Action Alternative

Surface water and groundwater resources would not be impacted under the No Action Alternative beyond impacts related to previously authorized activities.

3.8.4 Proposed Mitigation or Avoidance Measure

MRG proposes to follow environmental protection measures in addition to the previously described activities required by state and federal regulations. Sumps would be constructed to hold the estimated required capacity of drilling fluids and cuttings with one foot of freeboard. BMPs such as certified weed-free straw bales and silt fences would be used to minimize potential sediment loading to down -gradient surface water ways and features from disturbed areas. High-use disturbed areas would also be watered as necessary to minimize sedimentation loading of waterways due to wind erosion. Where drainage crossings cannot be avoided, culverts sized for the 100-year, 24-hour storm event would be placed as necessary where roads cross local drainages.

3.9 Grazing Management

3.9.1 Affected Environment

The Project Area is located within the Silver Peak Allotment as shown on Figure 6. This allotment encompasses approximately 299,900 acres within Esmeralda County. The Silver Peak Allotment is in management category “M” where the objective is to maintain the current resource condition. The only allotment resource management objective listed in the *Tonopah RMP* for the Silver Peak Allotment is to maintain riparian spring habitat (BLM 1997). No range improvements are located within the Project Area.

3.9.2 Environmental Consequences of the Proposed Action

Under the Proposed Action up to 35 acres of previously undisturbed desert scrub, sagebrush, and piñon/juniper woodland type vegetation would be disturbed from overland access, road

construction, and drill pad construction. These disturbances would be temporary and reclamation would occur as described in the APoO and in Section 2.2.3.2 *Reclamation*. The disturbance of 35 acres of vegetation equals approximately three percent of the Project Area. A loss of vegetation would constitute a reduction of forage for cattle which would remain until successful establishment of reclamation revegetation. Initial post-reclamation vegetation communities would be of a grassland type rather than a shrubland type which may be beneficial for grazing cattle. Over time the vegetation would return to desert scrub, sagebrush, and piñon/juniper types.

The short-term direct impact resulting from the Proposed Action would be a temporary loss of forage, and the long-term impact would be the resulting change in vegetation type after reclamation. The Proposed Action would not result in a decrease of animal unit months. Based on the size of the proposed disturbance, the size of the Silver Peak Allotment, and forage type within the Project Area, potential impacts to grazing management as a result of the Proposed Action are considered low.

3.9.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative no further loss of forage would occur within the Project Area beyond those resulting from approved activities.

3.9.4 Proposed Mitigation or Avoidance Measure

Project related traffic would observe prudent speed limits to protect livestock within the Project Area and on project access roads.

3.10 Land Use Authorization

3.10.1 Affected Environment

Entities with an interest in the location or general vicinity of the Proposed Action are limited to Sierra Pacific Power Company (now known as NV Energy), and Homestead Minerals. The table below lists right-of-way (ROW) holders adjacent to or within the proposed Project Area which are required to be notified of the Proposed Action (43 C.F.R. § 2807.14). The existing ROWs are for the Mineral Ridge access corridor and transmission line to the MRG patented claims as shown on Figure 7.

Table 8: Existing Rights-of-way within Project Area

Right-of-Way Holder	Case File	Type	Case Disposition	Location within Project Area
Sierra Pacific Power Company (NV Energy)	N-60662	ROW - Power Transmission - FLPMA	Authorized	T2S, R39E, Section 6
Homestead Minerals	N-51529	ROW - Roads	Authorized	T2S, R39E, Section 6
Esmeralda County	N-89441	ROW - Roads	Authorized	T2S, R38E, Sections 2, 3, and 10; T1S, R39E, Sections 31 – 34; and T2S, R39E, Sections 3, 4, and 6

Other ROWs in the vicinity of the Project Area are N-54403 (Rhyolite Ridge Road and Coyote Road) and a road (N-54409) leading to the northwest of the Project Area. These roads are currently used as access roads by MRG and are managed by Esmeralda County under ROW N-89441. The County maintains the East Canyon Road (N-51529 and N-89441), Hot Springs Road (N-54397), Coyote Road (N-62084), Rhyolite Ridge Road (N-54403), and the stretch of un-named road (N-89441) connecting the Coyote Road to the Mineral Ridge gate on the west side of the Project Area. MRG is currently in the process of securing an agreement with Esmeralda County regarding maintenance of access roads in the Project Area.

ROW N-60661 is currently listed as being held by MRRI, an entity which is no longer in existence. This ROW overlaps ROWs N-54403, N-51529 and N-62084 and is located along Coyote Road and Rhyolite Ridge Road. ROW N-51529 is located partially within the Project Area. The BLM is currently in the process of reassigning the overlapping sections of this ROW to current ROW holders.

3.10.2 Environmental Consequences of the Proposed Action

The aforementioned ROWs pass through the northeast corner of the Project Area as shown on Figure 7. No additional ROWs are proposed under the Proposed Action and the existing ROWs would not be altered. Any potential future power lines, pipelines, other access roadways would require separate use authorizations. Potential impacts to land use authorization are considered low under the Proposed Action.

3.10.3 Environmental Consequences of the No Action Alternative

No impacts to land use associated with the No Action Alternative are expected to occur.

3.10.4 Proposed Mitigation or Avoidance Measure

No mitigation or avoidance measures are necessary.

3.11 Minerals

3.11.1 Affected Environment

Both patented lands owned by MRG and lands administered by the BLM are located within the Project Area. BLM-administered lands within the Project Area are within MRG unpatented claims, thus MRG holds the mineral right patents to all lands within the Project Area. Only trace amounts of potential mineral resources would be removed as part of the exploration activities under the Proposed Action. No direct impacts to mineral resources are expected to occur. Exploration drilling would generate information about the mineral reserves of the area which may result in either more or less mining interest depending on the results and current mineral prices.

3.11.2 Environmental Consequences of the Proposed Action

Under the Proposed Action exploration activities would be conducted on patented and unpatented mining claims to further delineate the extent of economically viable gold reserves in the Project Area. Identification of the extent of gold resources could alter future mining development plans which would be required to undergo appropriate permitting procedures.

Exploration activities would not serve to deplete the existing mineral resources; the only mineral extraction which would take place within the Project Area would occur under previously authorized activities. Therefore, the impact to mineral resources under the Proposed Action is considered low.

3.11.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative the proposed exploration activities would not occur and the extent of mineralization beyond the Project Area would remain unidentified.

3.11.4 Proposed Mitigation or Avoidance Measure

No mitigation or avoidance measures have been proposed.

3.12 Recreation

3.12.1 Affected Environment

The Project Area is not located within an area designated as a special BLM recreation management area. Motorized recreation on BLM-administered lands in the areas surrounding and within the Project Area are limited to existing roads and trails (BLM 1997). Recreation within the Project Area is limited and dispersed and may include mountain biking, horseback riding, sightseeing, pine-nut gathering, outdoor photography, nature study, wildlife viewing, bird watching, and rock collecting.

3.12.2 Environmental Consequences of the Proposed Action

Activities under the Proposed Action would occur primarily on BLM-administered lands located adjacent to MRG patented lands. However, the installation of the cell phone extender, monitoring wells, fuel farm, the laboratory expansion, and power line relocation have or would occur primarily on patented lands within the active mining area. Recreational use of the BLM-administered lands adjacent to MRG patented lands is limited due to their proximity to patented lands and visible mine facilities such as the RDFs and the heap leach facility. Under the Proposed Action a temporary increase in road use by exploration equipment and vehicles would occur. Existing roads would not be blocked by drilling equipment. The presence of equipment, vehicles, and personnel could negatively affect the recreational experience in these immediate areas on a temporary basis.

No indirect impacts would occur. Based on the low recreational use within the Project Area, potential impacts to recreation as a result of the Proposed Action are considered low.

3.12.3 Environmental Consequences of the No Action Alternative

No impacts to recreation would occur besides those associated with the prior authorized activities of the Mineral Ridge Mine.

3.12.4 Proposed Mitigation or Avoidance Measure

Project-related traffic would observe prudent speed limits to protect the public within the Project Area and on project access roads.

3.13 Soils

3.13.1 Affected Environment

According to the Natural Resources Conservation Service (NRCS 2010) soil resource report for Esmeralda County the soils in the Project Area consist of the following units as shown on Figure 8 and listed in Table 9:

Table 9: Soil Units within the Project Area

Map Unit Symbol	Map Unit Name
490	Weepah-Kyler-Rock outcrop association
701	Armoine-Tulecan association
705	Armoine-Penelas association

Weepah-Kyler-Rock outcrop association occurs at elevations between 6,500 and 7,800 ft amsl on 15 to 50 percent slopes. This association is comprised of approximately 20 percent rock outcrops which are normally found along ridges. The Kyler soil has a profile of very gravelly fine sandy loam to gravelly loam with unweathered bedrock located at approximately nine to 13 inches bgs. The Weepah soil has a profile of very gravelly loam and weathered bedrock located approximately eight to 12 inches bgs. Their ability to transmit water is very low.

The Armoine-Tulecan association occurs at elevations between 6,000 and 7,600 ft amsl on 15 to 50 percent slopes. The Armoine soil has a profile of very gravelly sandy loam to very sandy clay loam with weathered bedrock located approximately 15 to 19 inches bgs. The Tulecan soil has a profile of very cobbly coarse sandy loam to very cobbly sandy clay loam with weathered bedrock located approximately 15 to 19 inches bgs. Their ability to transmit water is very low.

The Armoine-Penelas association occurs at elevations from 6,200 to 7,000 ft amsl. The Armoine soil in this association is found on eight to 30 percent slopes. The Penelas soil is found on eight to 50 percent slopes and has a profile of very channery loam to extremely channery clay loam with weathered bedrock located nine to 13 inches bgs. The ability of soil to transmit water is very low.

While the soil units within the Project Area have been defined, it should be noted that approximately 253 acres have been disturbed during mining activities. Native soils in these areas have been substantially disturbed and may not fit the above descriptions.

3.13.2 Environmental Consequences of the Proposed Action

The disturbance of 35 acres (approximately three percent) of the Project Area represents a small influence on the environment. Blading and vegetation destruction/removal related to overland access, road construction, and drill pad construction would be the primary contributors to soil disturbance. Installation of the monitoring wells, fuel farm, the laboratory expansion, and power line relocation would also contribute to soil disturbance. Removed soils would be pushed to the side of the proposed disturbance areas and used during reclamation as growth media. These disturbances would be temporary and reclamation would occur as described in the *Amended Plan of Operations/ Permit for Exploration NVN-*

73109/Reclamation Permit No. 0103 (GPMI 2003), the APoO, and in Section 2.2.3.2 Reclamation.

Soil disturbances would impede maturation of soil development, degrade soil structure, and hinder soil biological activity. Additionally, exposed soils would be susceptible to wind and water erosion; however, this impact would be reduced by adherence to soil erosion BMPs. Impacts would last until the successful revegetation of disturbed areas after reclamation.

Direct impacts to soils would include the removal of or disturbance to approximately 35 acres. Indirect impacts would include the loss of soil due to wind and water erosion after clearing and or earthworks. Based on the existing level of activity at the site and avoidance measures proposed by MRG, potential impacts to soils as a result of the proposed project are considered low.

3.13.3 Environmental Consequences of the No Action Alternative

No impacts to soils associated with the No Action Alternative would occur beyond those resulting from the prior authorized activities of the Mineral Ridge Mine.

3.13.4 Proposed Mitigation or Avoidance Measure

Project-related traffic would observe prudent speed limits to minimize dust (particulate) emissions. Water truck(s) would be used as necessary to control fugitive dust using water and/or a diluted solution of a lignin sulfonate organic binder with a small amount of surfactant, and trips for vehicles and equipment on disturbed areas would be limited.

3.14 Special Status Species

3.14.1 Affected Environment

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, guidance, or policy. The Nevada Natural Heritage Program (NNHP) database was queried in April, 2010 to determine the presence or absence of special status species in the area of the Proposed Action. One plant species and two bat species were identified as potentially occurring in the area: Beatley buckwheat (*Eriogonum beatleyae*); Townsend's big-eared bat (*Corynorhinus townsendii*); and the western pipistrelle (*Pipistrellus hesperus*). The NNHP query response also indicated that the Brazilian free-tail bat (*Tadarida brasiliensis*) and the western small-footed myotis (*Myotis ciliolabrum*) may also occur in the Project Area (NNHP 2010).

The NDOW data indicates that the Project Area is adjacent to greater sage-grouse (*Centrocercus urophasianus*) summer and winter range (NDOW 2010a). Beyond the special status species indicated by the NNHP and NDOW to potentially occur in the area, the following species may also occur as identified by the BLM: long-eared myotis (*Myotis evotis*); fringed myotis (*Myotis thysanodes*); long-legged myotis (*Myotis volands*); Yuma myotis (*Myotis yumanensis*); pallid bat (*Antozous pallidus*); big brown bat (*Eptesicus fuscus*); California myotis (*Myotis californicus*); long-eared myotis (*Myotis evotis*); long-legged myotis (*Myotis volans*); desert bighorn sheep (*Ovis canadensis nelsoni*); golden eagle (*Aquila chrysaetos*); burrowing owl (*Athene cunicularia*); ferruginous hawk (*Buteo regalis*); prairie

falcon (*Falco mexicanus*); loggerhead shrike (*Lanius ludovicianus*); and the vesper sparrow (*Pooecetes gramineus*).

Of the special status species which have been noted as potentially occurring within the Project Area, only the following were observed during biological surveys. They are discussed in more detail below.

Desert Bighorn Sheep

The desert Bighorn sheep is a BLM sensitive species. Desert bighorn sheep live in areas of rough terrain characterized by rocky canyons and washes. They require standing water sources during the summer months. The desert bighorn sheep is currently managed as a game animal in Nevada by NDOW (NDOW 2010b). The Project Area is located within the NDOW hunting unit 211 as shown on Figure 9, and within an occupied bighorn sheep area. Bighorn sheep have been observed in the area (BLM 1996).

A total of 148 desert bighorn sheep were observed in the Silver Peak Range and Volcanic Hills during aerial surveys conducted in 2007. Movement between the Silver Peak range and the Volcanic Hills occurs on a regular basis. Herd growth occurred between 2001 and 2005; however, drought conditions during 2007 and 2008 resulted in impacts to the habitat and the herd growth was curbed. The population is currently considered to be stable (NDOW 2009).

Loggerhead Shrike

The loggerhead shrike is listed as a Nevada special status species by the BLM. It is listed at the state level as “apparently secure” and at the global level as “secure”. This species is protected at the state level under NRS 501. The loggerhead shrike inhabits open country such as sagebrush and desert scrub habitats and requires good perching structures for hunting such as sturdy shrubs, fence posts, and some trees and often nests in shrubs and small trees. It feeds on large insects, lizards, small birds, and rodents (NatureServe 2010). The loggerhead shrike has been observed in the vicinity of the Project Area (BLM 1996).

Golden Eagle

The golden eagle is listed as a BLM sensitive species for Nevada and is listed as “apparently secure” at the state level and “secure” at the global level. It is afforded protection at the state level under NRS 501. At the federal level is afforded protection under The Bald and Golden Eagle Protection Act (16 USC 668-668d), the MBTA (16 U.S.C. 703-711), and the Lacey Act. The golden eagle generally inhabits open country and barren areas in hilly or mountainous regions. It nests in large trees or on cliff edges and rocks, and many have several nesting sites which it rotates through on various years (NatureServe 2010). Golden eagles have been sighted in the vicinity of the Project Area (BLM 1996).

Other Special Status Species

Because of the current emphasis on sage-grouse, a discussion on this species has been included even though the species have not been observed in the Project Area.

The sage-grouse is listed as a federal candidate species in Nevada under the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*) and is protected under state law NRS 527.270. The Project Area is located within the White Mountains sage-grouse population management unit (PMU) boundary. Potential summer and winter sage-grouse habitat are located adjacent to but not within the Project Area (NDOW 2010a). Sage-grouse occur in a wide variety of

sage brush mosaic habitats and leks are usually located in open sites surrounded by sage brush and near potential nesting areas.

The White Mountains PMU is located within both California and Nevada, and planning for this unit is shared between the two states. An aerial lek survey performed in 2008 detected a total of 33 sage-grouse individuals at nine locations between 9,000 and 9,700 ft amsl (NDOW 2008). The nearest lek to the Project Area is located approximately 25 miles away in the foothills of the White Mountains. Currently, no known leks occur on the Nevada side of the White Mountains (Englestead 2010).

3.14.2 Environmental Consequences of the Proposed Action

3.14.2.1 Plants

No Beatley buckwheat was identified within the Project Area during on-site surveys conducted for previous permitting documents; therefore, impacts to Beatley buckwheat are not expected to occur.

3.14.2.2 Wildlife

No direct impacts to special status species are anticipated to occur under the Proposed Action. Indirect impacts are anticipated to occur but have been determined to not be significant.

As described in Section 2.2.5 *Additional Environmental Protection Measures*, various measures would be taken for the protection of wildlife. These measures include the timing of land clearing and surface disturbances to prevent destruction of active bird nests or young of birds during the avian breeding season (March 1 through July 31). If surface-disturbing activities are unavoidable, MRG would have a qualified biologist survey areas for the presence of active nests immediately prior to the disturbance. If active nests are located, or if other evidence of nesting are observed, the area would be avoided to prevent destruction or disturbance of nests until the birds are no longer present. Active raptor nests would not be removed as a result of exploration operations unless approved by the BLM or other appropriate agency. Anti-perching devices would be added to power poles to protect raptors from electrocution.

In particular, no direct impacts to any of the bat species would be expected to occur under the Proposed Action since the proposed activities do not involve the alteration or entry of caves or underground workings.

Under the Proposed Action indirect impacts to special status species may occur through the disturbance of approximately 35 acres of previously undisturbed lands, resulting in the removal or destruction of vegetation and potential special status species habitat and fodder. This disturbance equals approximately three percent of the Project Area. Some disturbance of previously disturbed land has or would occur related to installation of the monitoring wells, fuel farm, the laboratory expansion, and power line relocation. Indirect impacts to special status species may include the short-term loss and alteration of potential habitat and long-term habitat and habitat fragmentation until the re-establishment of vegetation. Some species such as sagebrush could take up to 25 years to reach maturity. Direct impacts to insects and small wildlife such as rodents through the taking of individuals during land clearing activities and

the loss of habitat may in turn affect predatory special status species. An increase in human presence may also have an indirect effect on special status species occurring in the area.

The lignin sulfonate proposed for dust suppression use on roads would be applied at 0.25 gallons per square yard. At this dilution, the biodegradable and non-toxic binder and the small amount of associated surfactant would not adversely affect wildlife.

3.14.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative the proposed exploration activities would not be carried out and no further impacts to special status species would occur besides impacts related to authorized activities.

3.14.4 Proposed Mitigation or Avoidance Measure

In addition to the general wildlife protection measures listed in Section 2.2.5, a mitigation plan may be required if a water source currently being used by wildlife is cut off or disturbed due to project-related activities.

3.15 Vegetation

3.15.1 Affected Environment

Three major vegetation communities were identified within the vicinity of the Project Area: alluvial desert scrub; foothills desert scrub; and black sagebrush. All three of these floral assemblages are commonly occurring communities observable in the intermountain salt desert shrub rangelands. In addition to these three communities, the piñon/juniper woodland subtype of the Black sagebrush vegetation association was identified (BLM 1996). The nearest wetland/riparian vegetation to the Project Area is located at Tarantula Springs, approximately 500 feet from the Project Area boundary as shown on Figure 5.

Colonizing vegetation communities have established within disturbed areas, including species such as Douglas rabbitbrush (*Chrysothamnus viscidiflorus*) Russian thistle (*Salsola sali*), annual mustards, and cheatgrass. The non-native invasive species and noxious weeds are addressed under Section 3.6 *Noxious Weeds, and Invasive Nonnative Species* of this document.

3.15.2 Environmental Consequences of the Proposed Action

Under the Proposed Action approximately 35 acres of previously undisturbed vegetation would be disturbed from overland access, road construction, and drill pad construction. Some disturbance of previously disturbed land has or would occur related to installation of the monitoring wells, fuel farm, the laboratory expansion, and power line relocation. These disturbances would be temporary and reclamation would occur as described in the *Amended Plan of Operations/ Permit for Exploration NVN-73109/Reclamation Permit No. 0103* (GPMI 2003) and the APoO. The disturbance of 35 acres of vegetation equals approximately three percent of the Project Area.

This impact would last until reclamation revegetation success is established. Overland travel areas would be scarified and reseeded while constructed roads and drill pads would be regraded, ripped, and reseeded with an approved seed mixture. Vegetation established as part

of the reclamation process would be established primarily through the use of an approved seed mixture. Post-reclamation plant communities would differ in species composition and diversity from the adjacent native plant communities.

Upon successful reclamation of these areas the intermountain salt desert shrub type vegetation would be modified to a predominantly grassland community until the shrublands are restored over time. This modification would change habitat values for specific species.

The lignin sulfonate proposed for dust suppression use on roads would be applied at 0.25 gallons per square yard. At this dilution, the biodegradable and non-toxic binder and the small amount of associated surfactant would not adversely affect roadside plants.

3.15.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative no impacts to vegetation would occur beyond the impacts related to previously approved activities.

3.15.4 Proposed Mitigation or Avoidance Measure

No mitigation or avoidance measures proposed beyond the activities described in Section 2.2.3.2 *Reclamation*.

3.16 Wild Horses and Burros

3.16.1 Affected Environment

The Project Area is located within the Silver Peak Herd Management Area (HMA) for wild horses. The Silver Peak HMA encompasses approximately 242,455 acres. The *Tonopah Resource Management Plan and Record of Decision* (BLM 1997) lists the HMA population size at 312 horses and no burros; the Appropriate Management Level is set at 82 horses and no burros (BLM 1996). Results from a 2006 inventory flight and a projected 16 percent increase since then places the 2011 post-foaling population at 65 wild horses and no burros (Hollowell 2011).

3.16.2 Environmental Consequences of the Proposed Action

Wild horses in the area could potentially be affected by the loss of habitat and fodder. Under the Proposed Action approximately 35 acres would be disturbed, and revegetation efforts would alter the existing plant community in the short term from desert scrub, sagebrush, and piñon/juniper types to a grassland type. Over time the area would return to its original type. Some disturbance of previously disturbed land has or would occur related to installation of the monitoring wells, fuel farm, the laboratory expansion, and power line relocation. Activities under the Proposed Action would also temporarily increase the area of human presence while exploration is underway which may have a discouraging effect on the presence of wild horses in that immediate area.

Indirect impacts to wild horses would include the short-term reduction of forage by 35 acres which equals approximately three percent of the Project Area and less than one percent of the Silver Peak HMA. Although unlikely, the Proposed Action could result in the loss or disturbance of a water source currently used by wild horses. Indirect impacts associated with human presence would continue under the Proposed Action as long as the Mineral Ridge

Mine is active. Based on the existing level of activity at the site and the size of the Silver Peak HMA potential impacts to wild horses as a result of the Proposed Action would be considered low.

3.16.3 Environmental Consequences of the No Action Alternative

No impacts to wild horses or burros would occur under the No Action alternative beyond the impacts of the authorized activities.

3.16.4 Proposed Mitigation or Avoidance Measure

Project-related traffic would observe prudent speed limits to protect wildlife and wild horses as described under Section 2.2.5 *Additional Resource Protection Measures*. Efforts would be made to avoid disturbing wildlife and wild horses any more than what would be necessary for exploration activities. A mitigation plan may be required if a water source currently being used by wild horses is cut off or disturbed due to project-related activities.

3.17 Wildlife

3.17.1 Affected Environment

Wildlife species in the Project Area are typical of the southern Great Basin desert areas. A list of species which may occur in the Project Area is included as Appendix B.

Wildlife surveys were conducted in 1995 by Cedar Creek Associates Inc. in preparation for the 1996 *Mineral Ridge Resources Incorporated Environmental Assessment* (BLM 1996). Big game species found to occur in or near the Project Area include desert bighorn sheep (discussed in Section 3.14 *Special Status Species*) and mule deer (*Odocoileus hemionus*). Furbearers and other predators include coyote (*Canis latrans*), ringtail cat (*Bassariscus astutus*), badger (*Taxidea taxus*), kit fox (*Vulpes macrotis*), and bobcat (*Lynx rufus*). Other mammals occurring within or near the Project Area are pronghorn antelope (*Antilocapra americana*), black-tailed jackrabbit (*Lepus californicus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), least chipmunk (*Tamias minimus*), and desert woodrat (*Neotoma lepida*). Bats may also occur in underground workings and cave areas (BLM 1996). Particular bat species were discussed in Section 3.14 *Special Status Species* of this document.

Raptors sighted in the area include the golden eagle (discussed in Section 3.14 *Special Status Species*), Red-tailed hawk (*Buteo jamaicensis*), and the Great horned owl (*Bubo virginianus*). Upland game birds included Mourning dove (*Zenaida macroura*) and Chukar (*Alectoris chukar*), and other birds sighted included the Rock wren (*Salpinctes obsoletus*), Northern mockingbird (*Mimus polyglottos*), Pinyon jay (*Gymnorhinus cyanocephalus*), Loggerhead shrike (*Lanius ludovicianus*) (discussed in Section 3.14 *Special Status Species*), and House finch (*Carpodacus mexicanus*) (BLM 1996). Migratory birds were discussed in detail in Section 3.4 *Migratory Birds* of this report.

Seven reptiles and no amphibians were observed during the 1995 surveys. Mineral Ridge mine employees reported having sighted a western rattlesnake within the Project Area (BLM 1996), and multiple lizard species are also expected to occur (Englestead 2010).

The Project Area is within the NDOW hunting unit 211 encompassing approximately 1,065,300 acres. This unit is not located within NDOW wildlife management units. NDOW

data indicate that the Project Area is within an occupied bighorn sheep area and year-round mule deer habitat as shown on Figure 9. Desert bighorn sheep were discussed under Section 3.14 *Special Status Species*.

Mule deer populations within Esmeralda County have not been surveyed; deer population estimates have been based on harvest data. The population is estimated to be approximately 300 adult animals from both hunting units 211 and 21 (together encompassing approximately 2,295,000 acres as shown on Figure 9). Very dry conditions experienced most years since the late 1990's have likely reduced production and recruitment rates in the area resulting in low populations. Central Nevada experienced more favorable moisture patterns during the late winter and spring of 2008, but this was not enough to substantially improve the degraded range conditions (NDOW 2009).

3.17.2 Environmental Consequences of the Proposed Action

Under the Proposed Action approximately 35 acres of previously undisturbed lands would be disturbed, resulting in the removal or destruction of vegetation and potential wildlife habitat and fodder. This disturbance equals approximately three percent of the Project Area. Some disturbance of previously disturbed land has or would occur related to installation of the monitoring wells, fuel farm, the laboratory expansion, and power line relocation. Installation of the cell phone extender is not expected to have adverse effects on wildlife beyond a small amount of surface disturbance.

The lignin sulfonate proposed for dust suppression use on the roads would be applied at 0.25 gallons per square yard. At this dilution, the biodegradable and non-toxic binder and the small amount of associated surfactant would not adversely affect wildlife.

Direct impacts to small wildlife such as rodents would include the potential for the taking of individuals during land clearing activities. Indirect impacts associated with human presence would continue under the Proposed Action as long as the Mineral Ridge Mine is active. Based on the existing level of activity at the site and the location of the Project Area within an otherwise undeveloped/undisturbed area, potential impacts to wildlife as a result of the Proposed Action would be considered low.

Indirect impacts to wildlife from exploration-related surface disturbances would include the short-term loss and alteration of potential habitat and long-term habitat and habitat fragmentation until the re-establishment of vegetation. Some species such as sagebrush could take up to 25 years to reach maturity. The displacement of wildlife could also occur due to an increased human presence in exploration areas. In areas where habitats are at or near their wildlife carrying capacity, displacement could add further stresses to the habitat and/or reductions in wildlife populations in adjacent habitat areas.

3.17.3 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, the proposed exploration activities would not occur and no further impacts to wildlife beyond impacts related to the approved activities would occur.

3.17.4 Proposed Mitigation or Avoidance Measure

In order to avoid potential impacts to nesting birds, a nesting survey would be conducted within potential breeding habitat prior to surface disturbance during the avian breeding season

(March 1 to July 31) as previously described in Section 3.4 *Migratory Birds* of this document. Anti-perching devices would be added to power poles to protect raptors from electrocution.

Anticipated sump dimensions would be about ten feet by four feet by five feet deep or smaller. Final sump dimensions would be designed to meet the estimated required capacity of drill fluids and cuttings with one foot of freeboard. One end of each sump would be sloped to provide an escape route in the event an animal enters the sump. Sumps would be fenced until backfilled after completion of drilling for safety reasons and to ensure protection of the environment.

Project-related traffic would observe prudent speed limits to protect special status species as described under Section 2.2.5 *Additional Resource Protection Measures*. Efforts would be made to avoid disturbing special status species any more than what would be necessary for exploration activities.

4.0 CUMULATIVE IMPACTS

This chapter analyzes the potential cumulative impacts from past, present, and reasonably foreseeable future actions combined with the Proposed Action within defined Cumulative Effects Study Areas (CESAs). As defined by federal regulations (40 C.F.R. §1544.7), cumulative impacts are: "...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 (RFFAs) regardless of what agency (federal or non-federal) or person undertakes such other actions." Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time.

Therefore, as required under NEPA, this chapter addresses the cumulative effects on the identified environmental resources in the CESA which could result from the implementation of the Proposed Action and the No Action Alternative, past actions, present actions, and RFFAs.

For the purposes of this analysis and under federal regulations, "impacts" and "effects" are assumed to have the same meaning and are interchangeable. For this EA, the extent of the CESA varies according to the resource being considered. In addition, the length of time for cumulative effects analysis may vary according to the duration of impacts from the Proposed Action on the particular resource.

Environmental consequences of the Proposed Action and the No Action Alternative were evaluated previously in Section 3. Based upon the analysis of the environmental resources, the following resources would be impacted by the Proposed Action:

- Air Quality;
- Cultural Resources;
- Human Health and Safety;
- Migratory Birds;
- Native American Religious Concerns;
- Noxious Weeds, Invasive and Non-native Species;
- Waste, Hazardous and Solid;
- Surface and Groundwater (occurrence and quality);
- Grazing Management;
- Recreation;
- Soils;
- Special Status Species;
- Vegetation;
- Wild Horses and Burros; and

- Wildlife.

The CESA for the following resources includes the Silver Peak grazing allotment plus the area around the town of Silver Peak to the eastern border of Range 39. This CESA encompasses approximately 313,300 acres: air quality; cultural resources; migratory birds; noxious weeds; water quality; grazing management; recreation; soils; special status species; vegetation; wild horses and burros; and wildlife. This CESA is shown on Figure 10 is referred to as the Silver Peak Allotment CESA.

The CESA for the remaining resources includes the land included within T1S, R38E; T1S, R39E; T2S, R38E; and T2S, R39E. This area encompasses most of the Silver Peak Range and portions of adjacent Clayton Valley as shown on Figure 10, a total of approximately 92,160 acres; this area is referred to as the Silver Peak Range CESA. Resources considered under this CESA are human health and safety, and hazardous and solid waste. The Silver Peak Range CESA is contained within the Silver Peak Allotment CESA.

4.1 Past Actions

The Silver Peak Range CESA has been extensively disturbed by both underground and surface mining operations which extend from the nineteenth century until present day. Historic mining operations included mining, milling, and waste rock disposal. The Silver Peak Range and Silver Peak Allotment CESA have both been used historically for grazing and for limited and dispersed recreation. Most of the roads in the area are due to prospecting and mining related activities.

During the spring of 2004, two existing wildlife water developments in the Silver Peak Range were rebuilt, and a third was repaired in 2008, increasing the amount of available habitat in the Silver Peak Range.

Documented and permitted past actions on BLM-administered lands are listed and briefly described below:

Table 10: Past BLM Registered Actions

BLM Serial Number	Case Type	Name	Township and Range (MDBM)	Section(s) ¹
Silver Peak Range and Allotment CESAs				
N-6187901	Sale – R&PP	Esmeralda County	T2S, R39E	27
N-75424	R&PP	Esmeralda County	T2S, R39E	21, 27, 28
N-42582	Mineral Patent Application	Foote Mineral Company	T2S, R39E	12, 13, 24, 25
			T1S, R40E	31-35
			T2S, R40E	1-11, 16-20, 29-32
Silver Peak Allotment CESA Only				
N-75266	Sale	Diversified Machine Tech Inc.	T3S, R38E	1, 2

¹Activities may be located in all or part of the listed sections

Under the Recreation and Public Purposes (R&PP) Act, Esmeralda County obtained approximately ten acres in 2000 to be used as a community landfill (N-6187901) and approximately 40 acres in 2005 for the Silver Peak Emergency Services Training Center (N-75424). In 2002, 27.5 acres were sold from the BLM to Diversified Machine Tech Inc. (N-75266). These lands have since been removed from the public domain and are no longer managed on behalf of the public as public resources. Collectively, these actions have resulted in the removal of approximately 78 acres of land from BLM administration.

A mineral patent application was submitted by Foote Minerals (N-42582) for mineral patents on 10,710 acres and the patent issued in 1988. The locatable and saleable mineral rights for these lands have been removed from the public domain.

4.2 Present Actions

Present actions within the Silver Peak Range CESA and the Silver Peak Allotment CESA include livestock grazing, dispersed recreation, and activities associated with the continued operation of the Mineral Ridge Mine. Developed recreational opportunities are relatively sparse in this part of Nevada and tend to be limited to OHV/ATV use, dirt bike riding, hunting/shooting, and camping. Other recreational activities may include mountain biking, horseback riding, sightseeing, outdoor photography, nature study, pine nut gathering, wildlife viewing, bird watching, and rock collecting. Except for hunting/shooting, these activities are much dispersed and occur sporadically in low numbers.

The town of Silver Peak houses families and some businesses. Domestic and municipal construction and repair activities are ongoing.

The areas within both of the CESAs have been mapped for alternative energy potentials. The areas within both CESAs have been mapped as having National Renewable Energy Laboratory (NREL) Wind Potential wind power class between two (200-300 watts per square meter (W/m^2)) and four (400-500 W/m^2) with class four areas found on the higher ridges within the Silver Peak Range. For comparison, the highest wind power class listed by NREL is seven (greater than 800 W/m^2). Both CESAs are located wholly within NREL Photovoltaic Resource Potential areas categorized as having “excellent” potential at 6,310 to 6,452 kilowatt hours per square meter (kWh/m^2) per day. NREL concentrating solar power estimates within the CESAs ranges from six to 7.5 watt hours per square meter (Wh/m^2) per day or an annual direct normal irradiance of 7,247 to 7,449. As a comparison, the NREL concentrating solar power categories go up to greater than eight Wh/m^2 per day (NREL 2010).

No areas within the CESAs have been designated as geothermal prospective areas; however, 22 authorized non-producing geothermal leases exist within the CESAs, along with five pending applications. Active mining claims within the CESAs total 1,167.

The locations of other authorized current activities on BLM-administered lands are listed and briefly described below:

Table 11: Present BLM Registered Actions

BLM Serial Number	Case Type	Name	Township and Range (MDBM)	Section(s) ¹
Silver Peak Range and Allotment CESAs				
N-72542	Surface Management - Plan	Chemetall Foote Corporation	T2S, R39E	12, 13, 21-25
			T1S, R40E	27, 28, 31-35
			T2S, R40E	1 – 11, 16-20, 29-32
N-85677	Surface Management - Notice	Silver Reserve Corporation	T2S, R37E	25
N-73158	Surface Management - Plan	Homestead Minerals Corporation	T2S, R38E	31-34
			T3S, R38E	1-6, 15, 22, 29
N-88465	Geothermal Geophysical Exploration	RamPower	T1S, R39E	25-28 and 36
			T2S, R39E	1 lots 1 through 4 and 12
N-89289	Geothermal Geophysical Exploration	Chemetall Foote Corporation	T2S, R39E	13, 23-25
Silver Peak Allotment CESA Only				
N-83577	Surface Management - Notice	Infrastructure Materials Corporation (Operator)	T3S, R38E	4
N-73451	Surface Management - Notice	Vanderbilt (RT) Company	T1N, R37S	22

¹Activities may be located in all or part of the listed sections

Present actions within the Silver Peak Range and Allotment CESAs include a surface management plan by Chemetall Foote Corporation (N-72542) for lithium carbonate from brine. As of 2008, 630 acres had been disturbed. Chemetall Foote Corporation is also conducting geothermal geophysical exploration (N-89289) under which 0.5 acres are authorized for disturbance.

The Silver Reserve Corporation, now the Infrastructure Materials Corporation, filed a disturbance notice (N-85677) for 3.28 acres to explore for gold, silver, and base metals. Infrastructure Materials Corporation, as the operator filed for a notice for exploration for gold, silver, and base metals with a disturbance area of up to 1.28 acres. As of 2009 1.1 acres of disturbance had been reported (N-83577).

Homestead Minerals Corporation is currently in the reclamation phase for a gold mining operation. As of 2006 40 acres had been permitted for disturbance and ten acres of this had been reclaimed (N-73158).

Vanderbilt (RT) Company Inc. has submitted a notice for the intention to disturb up to four acres as part of a clay exploration operation (N-73451). Four acres of disturbance have been reported as of 2009.

RamPower holds a geothermal lease of 4,478 acres (N-88465). A total disturbance of 42.12 acres has been authorized consisting of geothermal pads and roads.

Collectively, these present actions have resulted in the disturbance of approximately 712 acres of public land administered by the BLM.

4.3 Reasonably Foreseeable Future Actions

The RFFAs within the CESAs would be dominated by mining activities. Ongoing drought conditions could adversely affect vegetation and water resources in the area. Mineral exploration activities can be expected to continue based on current supply and demand of minerals and commodities. Livestock grazing and dispersed recreational activities are expected to continue consistent with the past and present actions discussed.

Much of the area surrounding the town of Silver Peak is identified as suitable for disposal, utilizing direct sale procedures, in the Tonopah Resource Management Plan (BLM 1997). The authority for the potential sale of this land would come under Sections 203 and 209 of FLPMA, U.S.C. 1713 and 1719, or disposal through the R&PP Act, and special legislation.

Table 12: BLM-Registered RFFAs

BLM Serial Number	Case Type	Name	Township and Range (MDBM)	Section(s) ¹
Silver Peak Range and Allotment CESA				
To be determined (TBD)	Geothermal Plant	Chemetall Foote Corporation	T2S, R39E	TBD

¹Activities may be located in all or part of the listed sections

Chemetall Foote Corporation has submitted an Operating Plan for a geothermal plant near Silver Peak. The serial number and exact location have yet to be determined. A total disturbance of 5.6 acres has been proposed. Cumulative Impacts

In accordance with the guidance document, *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997), the potential cumulative impacts to the CESA for all of the resources presented and evaluated in Chapter 3, are presented below.

Table 13 shows past, present, proposed, and future effects on the area of the Proposed Action and the CESAs.

4.4 No Action Alternative

The No Action Alternative would prevent the disturbance of an additional 35 acres within the CESAs. This acreage constitutes less than one percent of either the Silver Peak Range CESA or the Silver Peak Allotment CESA. Therefore, combined impacts of the No Action Alternative, past and present actions, and other RFFAs would not contribute to impacts to the aforementioned resources.

4.5 Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitment of resources is expected.

Table 13: Effects of Actions on Resources

Resource	Past Actions	Present Actions	Proposed Actions	Future Actions	Cumulative Effect
Air Quality	Temporary impacts resulting from mining and exploration activities, and vehicle and equipment use.	Potential for temporary impacts due to land clearing activities as well as municipal and domestic construction activities near the town of Silver Peak.	Implemented mitigation measures would meet or exceed Nevada Air Quality guidelines.	Occasional dust and vehicle emissions from vehicles involved in land clearing/moving activities may impact air quality.	No measurable change in existing environment.
Cultural Resources	Permanent impacts to cultural resources may have occurred as a result of past mining and recreation activities.	Unauthorized activities may result in impacts to cultural resources; permitted activities are required to carry out cultural resource surveys in advance of land disturbance.	Proposed mitigation would eliminate potential impacts to cultural resources from exploration activities.	Sale of lands from the BLM to other entities would not result in adverse impacts to significant cultural resources provided appropriate mitigation has been completed prior to the land sale; other authorized activities would be cleared for cultural resources.	No measureable impact anticipated.
Human Health and Safety	Existing impacts from past mining activities exist such as unfenced or grated underground workings.	Current mining does not involve the creation of unfenced underground workings. Existing facilities do include open pits; however, these are located within the active mine boundary.	Public safety would be maintained throughout the life of the project. All hazardous materials would be appropriately stored and disposed of. Traffic in the area may increase slightly. Open pits would be within the active mine boundary.	Future activities could create risks to human health and safety such as open pits and highwalls if they are not appropriately closed or bermed.	No measurable change.

Resource	Past Actions	Present Actions	Proposed Actions	Future Actions	Cumulative Effect
Migratory Birds	Some residual loss of migratory bird habitat from past land disturbing activities where habitat has not been restored; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and active management for wildlife.	Some loss of migratory bird habitat could occur as well as the taking of individuals without appropriate mitigation activities on non-BLM authorized projects; sales would result in a loss of federal public lands and BLM-administered management for migratory birds.	Some loss of migratory bird habitat could occur. Mitigation efforts would reduce the chances for the taking of individuals.	The sale of lands would result in a loss of land from the public domain managed for migratory birds; future land clearing activities could reduce/alter potential habitat.	The Proposed Action with mitigation measures implemented would not cause an incremental impact to migratory birds.

Resource	Past Actions	Present Actions	Proposed Actions	Future Actions	Cumulative Effect
Native American Religious Concerns	Some loss of Native American resources may have been lost or altered as part of past actions.	Present actions on federal lands must undergo Native American consultation. Mitigation or avoidance measures may be required. Impacts to Native American resources may occur resulting from actions on non-federal lands.	The Proposed Actions would not directly impact known properties of cultural or religious importance to Native Americans.	The sale of lands would result in a loss of land from the federal public domain managed for Native American resources; Native American resources should be addressed as part of land-sale actions; future land clearing activities could alter or remove Native American resources.	Exploration roads leading to drilling locations, although intended to be temporary and reclaimed, are frequently used by members of the public to access formerly inaccessible locations. If members of the public increasingly utilize former drill roads, the cultural/traditional/spiritual integrity of any adjacent Native American use may be compromised.

Resource	Past Actions	Present Actions	Proposed Actions	Future Actions	Cumulative Effect
Noxious Weeds, Invasive and Non-native Species	Past mining recreation, grazing, and mining activities, along with land disturbing activities has created favorable habitat for the establishment of noxious weeds increasing their populations; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and active BLM-administered management for noxious weeds.	Further land disturbing activities can result in favorable habitats for the establishment of noxious weeds; land sales would result in a loss of BLM-administered lands and BLM-administered management for noxious weeds.	Lands disturbed under the Proposed Action would become favorable for the establishment of noxious weeds. Mitigation measures would be taken to prevent undue degradation.	The sale of lands would result in a loss land from the federal public domain managed for noxious weeds; land clearing activities could create favorable conditions for the spread of these species.	The Proposed Action with mitigation measures implemented would not result in an incremental impact resulting from noxious weeds and invasive non-native species.
Wastes, Hazardous and Solid	Hazardous and solid waste has been created during past mining, exploration.	Functioning mining operations are managing hazardous and solid waste programs; Silver Peak also has a licensed landfill; hazardous waste created by individuals may or may not be managed appropriately.	Hazardous and solid waste created under the Proposed Action would be handled as part of the existing MRG hazardous and solid waste programs.	The sale of lands would result in a loss of land from the federal public domain managed for hazardous and solid waste; occupation of these lands by other entities may inhibit unauthorized dumping in these areas.	The Proposed Action would not have an incremental effect on hazardous and solid waste.

Resource	Past Actions	Present Actions	Proposed Actions	Future Actions	Cumulative Effect
Water Quality	Water quality may have been affected by past mining, grazing, recreation, and other land-disturbing activities; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and active BLM-administered management for water resources.	Water quality may be affected by land disturbing activities; water resources may also be affected by groundwater wells and inappropriate management of wastes.	Avoidance measures by MRG would minimize potential impacts to water resources.	Land clearing activities could affect water resources; the sale of lands would result in a loss of land from the federal public domain managed for water resources; however, drilling activities on these lands would still be regulated by the NDWR.	The Proposed Action with the mitigation measures in place would not result in an incremental impact on water resources.
Grazing Management	Land-disturbing activities may have altered the amount and type of forage within the CESAs; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and BLM-administered grazing management.	Additional land-clearing activities may reduce AUMs while revegetation may improve forage types.	Activities under the Proposed Action would temporarily reduce AUMs while revegetation efforts may improve forage types.	The sale of lands would result in a loss of land from the federal public domain managed for grazing and reduce the number of available BLM-administered AUMs; land clearing activities could reduce AUMs.	The Proposed Action would not create a significant impact to grazing management.

Resource	Past Actions	Present Actions	Proposed Actions	Future Actions	Cumulative Effect
Recreation	Land-disturbing activities may have altered the recreational experience of the area; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and active BLM-administered management for recreation.	Additional land-clearing activities may reduce recreational access and experience potential.	Activities under the Proposed Action would temporarily reduce AUMs while revegetation efforts may improve forage types in the short term. Mitigation measures would be taken to prevent blocking recreational access.	The sale of lands would result in a loss of BLM-administered lands and management for recreation; land clearing activities and developments could reduce the recreational experience.	The Proposed Action would not create an incremental impact to recreation.
Soils	Land-disturbing activities may have disturbed/alterd soils; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and active BLM-administered management for soils.	Additional land-clearing activities resulting in approximately 712 acres or less than one percent of the Silver Peak Allotment CESA may disturb soils resulting in soils resource change or loss.	Activities under the Proposed Action would result in the disturbance and loss of soil resources until reclamation success. Mitigation measures would be taken to prevent undue degradation.	The sale of lands would result in a loss of BLM-administered lands; land clearing/moving activities could disturb/remove soil resources.	The Proposed Action with mitigation measures in place would not create an incremental impact to soils.

Resource	Past Actions	Present Actions	Proposed Actions	Future Actions	Cumulative Effect
Special Status Species	Land-disturbing activities may have removed/alterd potential special status species habitat; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and active BLM-administered management for wildlife.	Additional land-clearing activities resulting in approximately 712 acres or less than one percent of the Silver Peak Allotment CESA may disturb potential special status species habitat; unauthorized taking of individuals may affect populations.	Activities under the Proposed Action would result in the short-term loss of potential special status species habitat until reclamation success and return of the vegetation community to its natural state; mitigation measures as discussed in Section 3.14 would be taken to prevent undue degradation.	The sale of lands would result in a loss of BLM-administered lands; future land clearing activities could reduce/alter potential habitat.	The Proposed Action with mitigation measures in place would not create an incremental impact to special status species.
Vegetation	Land-disturbing activities may have removed vegetation and altered vegetation communities; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and active BLM-administered management for vegetation.	Additional land-clearing activities resulting in approximately 712 acres or less than one percent of the Silver Peak Allotment CESA may disturb/alter vegetation and vegetation communities.	Activities under the Proposed Action would result in the short-term loss of vegetation until successful reclamation and a change in the plant community until reestablishment of the natural species composition.	The sale of lands would result in a loss of BLM-administered lands; future land clearing activities could reduce/alter vegetation communities.	The Proposed Action would not create an incremental impact to vegetation.

Resource	Past Actions	Present Actions	Proposed Actions	Future Actions	Cumulative Effect
Wildlife	Land-disturbing activities may have removed/alterd wildlife habitats; removal of approximately 78 acres or less than one percent of the Silver Peak Allotment CESA from the federal public domain and active BLM-administered management for wildlife.	Additional land-clearing activities resulting in approximately 712 acres or less than one percent of the Silver Peak Allotment CESA may disturb/alter wildlife habitat; unauthorized taking of animals may also affect populations.	Activities under the Proposed Action would result in the loss of potential wildlife habitat and possibly the taking of individuals; mitigation measures would be taken to prevent undue degradation.	The sale of lands would result in a loss of BLM-administered lands; future land clearing activities could reduce/alter potential habitat.	The Proposed Action with mitigation measures in place would not create an incremental impact to wildlife.

5.0 CONSULTATION AND COORDINATION

The scope of this EA was developed through consultation with BLM resource specialists (tele-conferences and subsequent conversations); consultation with other local, state, and federal agency resource personnel; review of project proponent and agency files; and review of supporting documentation.

5.1 List of Preparers

5.1.1 BLM – Tonopah Field Office

Leighandra Keeven	Mining Engineer and Project Lead
Alan Buehler	Supervisory Geologist
Devin Englestead	Wildlife Biologist
John Hartley	Planning and Environmental Coordinator
Dustin Hollowell	Wild Horse and Burro Specialist
Sheryl Post	Rangeland Management Specialist
Susan Rigby	Archaeologist
Adam Stephens	Rangeland Management Specialist

5.1.2 BLM – Mount Lewis Field Office

Cory Gardner	Environmental Protection Specialist
Angelica Rose	Planning and Environmental Coordinator

5.1.3 BLM – Battle Mountain District Office

Dave Davis	Planning and Environmental Coordinator
Larry Grey	RECO (Renewable Energy Coordination Office) Hydrologist
Wendy Seley	RECO Realty Specialist

5.1.4 SRK Consulting (U.S.), Inc.

Carrie Schultz	Project Manager
Valerie Sawyer	Project Principal
Brett Bingham	AutoCAD/GIS Consultant
Angel Lino	Consultant

5.2 Persons, Groups, or Agencies Consulted

The following persons, groups, and agencies were contacted during the preparation of this document.

5.2.1 Nevada Natural Heritage Program

Eric S. Miskow	Biologist III/Data Manager
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5.2.2 Native American Groups and Representatives

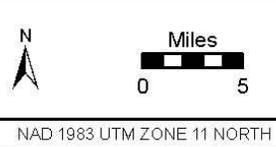
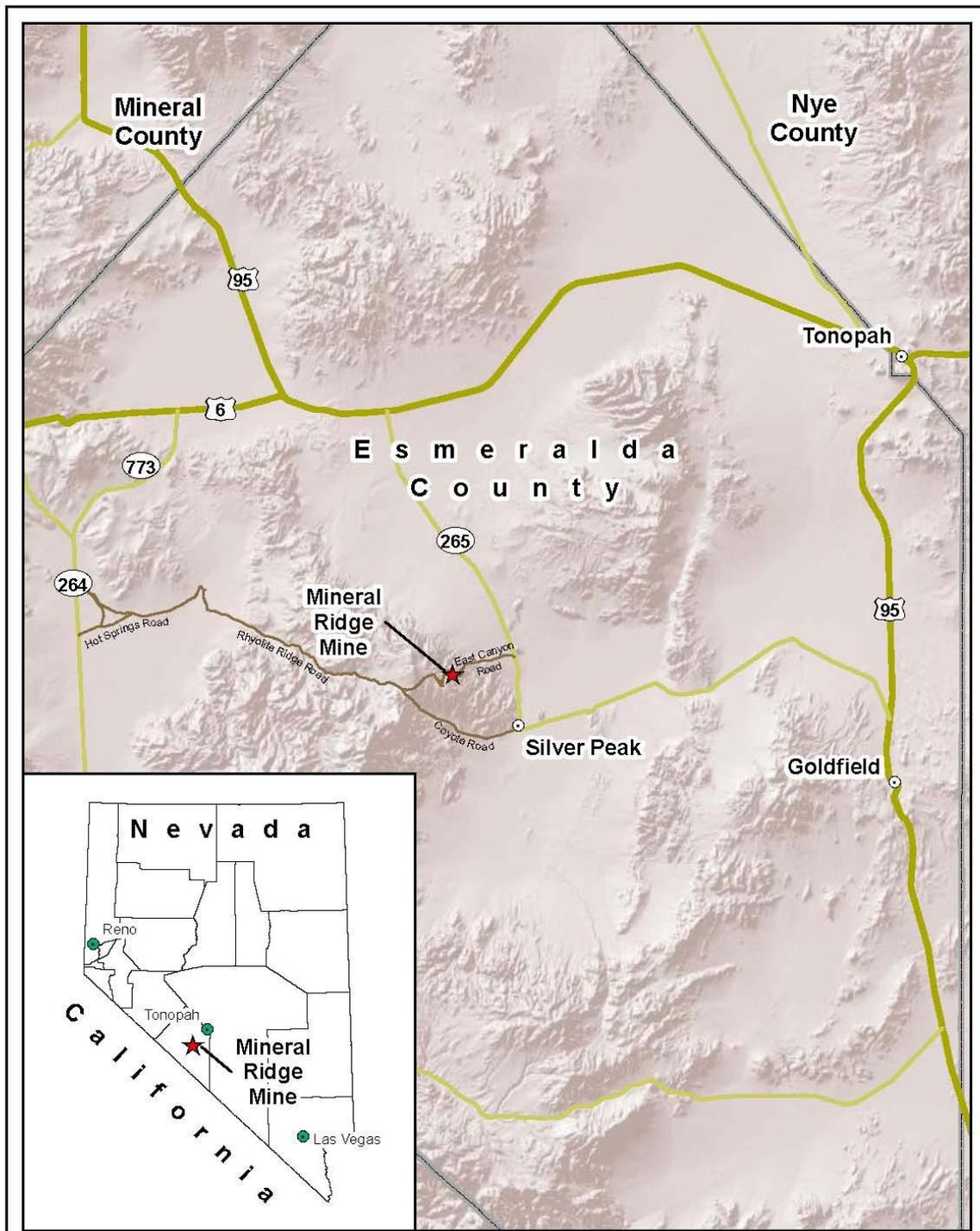
Information sharing is on-going with the Timbisha Shoshone Tribe and will continue throughout the life of the project. General information about the proposed up-coming project was shared with Timbisha Shoshone tribal representatives on July 29, 2009. The tribal representatives asked to be kept updated about all projects in the Clayton Valley area. Due to internal events within the Timbisha Shoshone Tribe, The Bureau of Indian Affairs (BIA) refused to recognize the tribal council in 2010. BIA made a decision in March of 2011 to recognize a council in Bishop, California beginning March 1, 2011 for a period of 120 days. An election was held May 21, 2011 re-electing the Bishop council. Due to on-going litigation, that council has not yet been recognized by BIA. Information sharing with the Tribal Historic Preservation Officer (THPO) has continued since the inception of the project. Information sharing will continue with the THPO and the council in Bishop, but formal consultation cannot be offered until a council has been officially recognized by BIA. No concerns have been raised about this project by tribal representatives or members.

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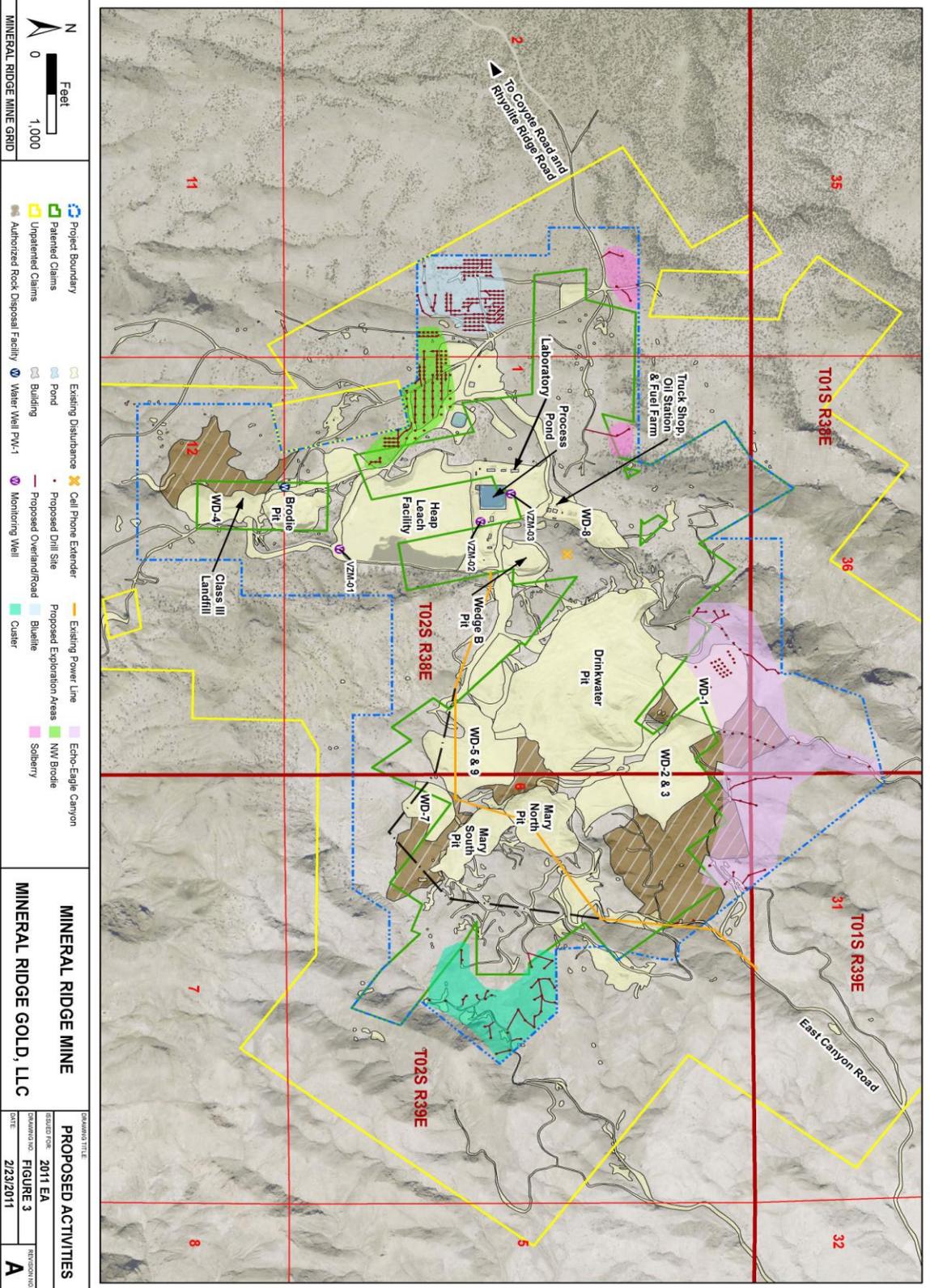
Figures



MINERAL RIDGE MINE
MINERAL RIDGE GOLD, LLC

DRAWING TITLE: GENERAL LOCATION	
ISSUED FOR:	2011 EA
DRAWING NO.:	FIGURE 1
DATE:	2/23/2011
REVISION NO.:	A

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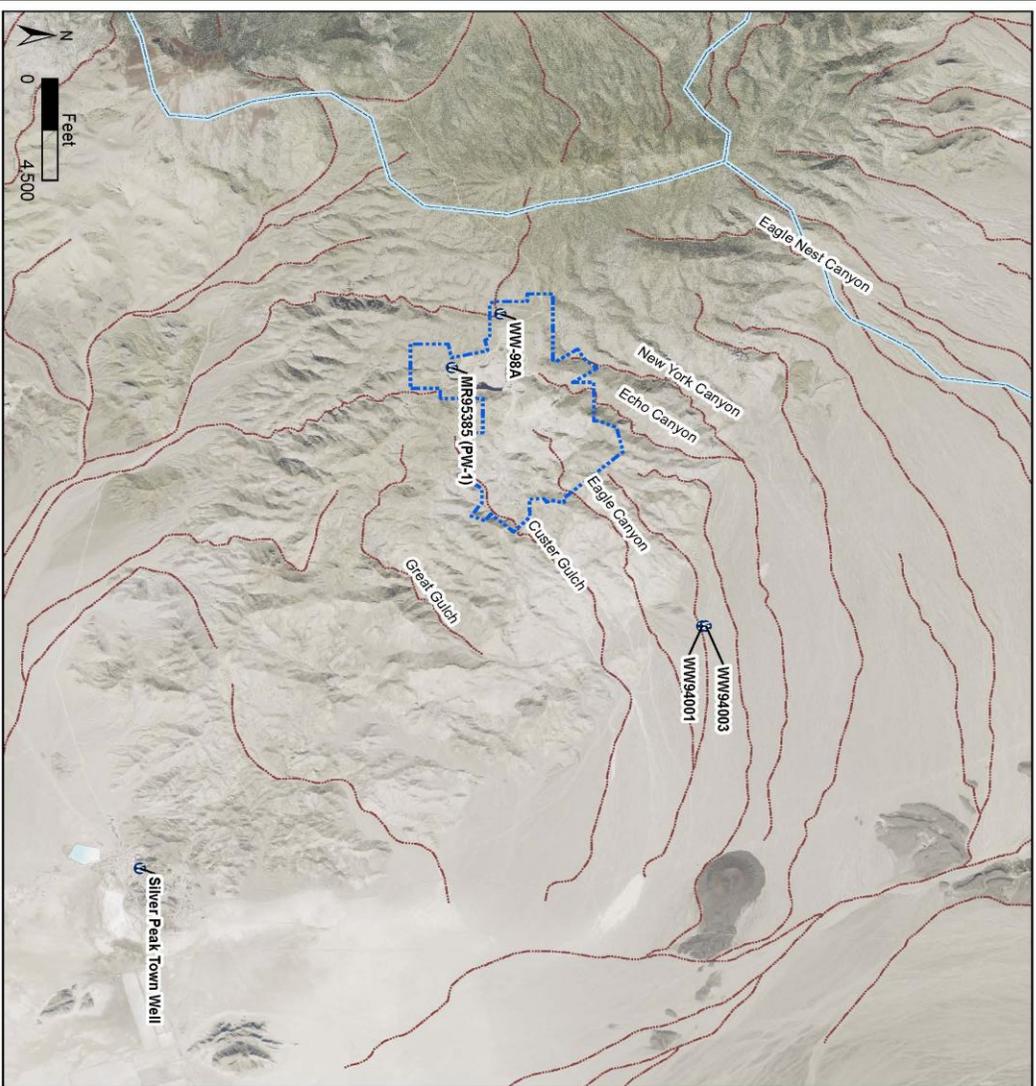


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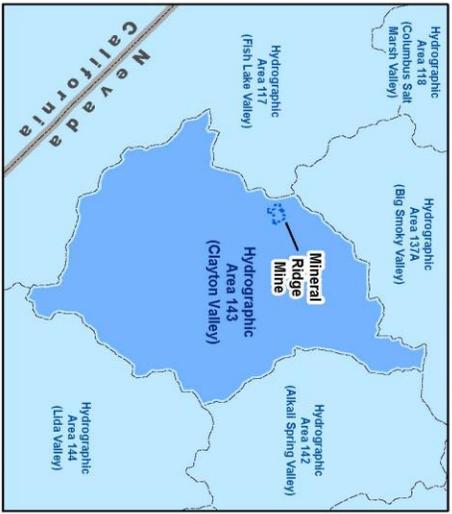
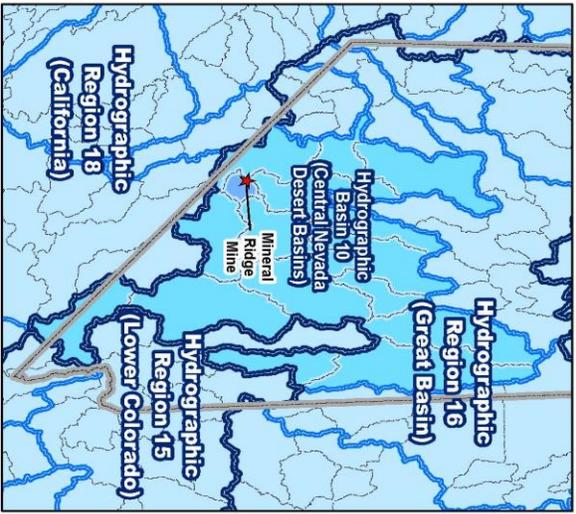
- Project Boundary
- Patented Claims
- Unpatented Claims
- Authorized Rock Disposal Facility
- Existing Disturbance
- Pond
- Building
- Water Well PW-1
- Monitoring Well
- Existing Power Line
- Proposed Power Line
- Proposed Drill Site
- Proposed Overland Road
- Bluelite
- Cluster
- Call Phone Extender
- Proposed Expiration Areas
- Echo-Eagle Canyon
- NW Brodie
- Soberly

MINERAL RIDGE MINE
MINERAL RIDGE GOLD, LLC

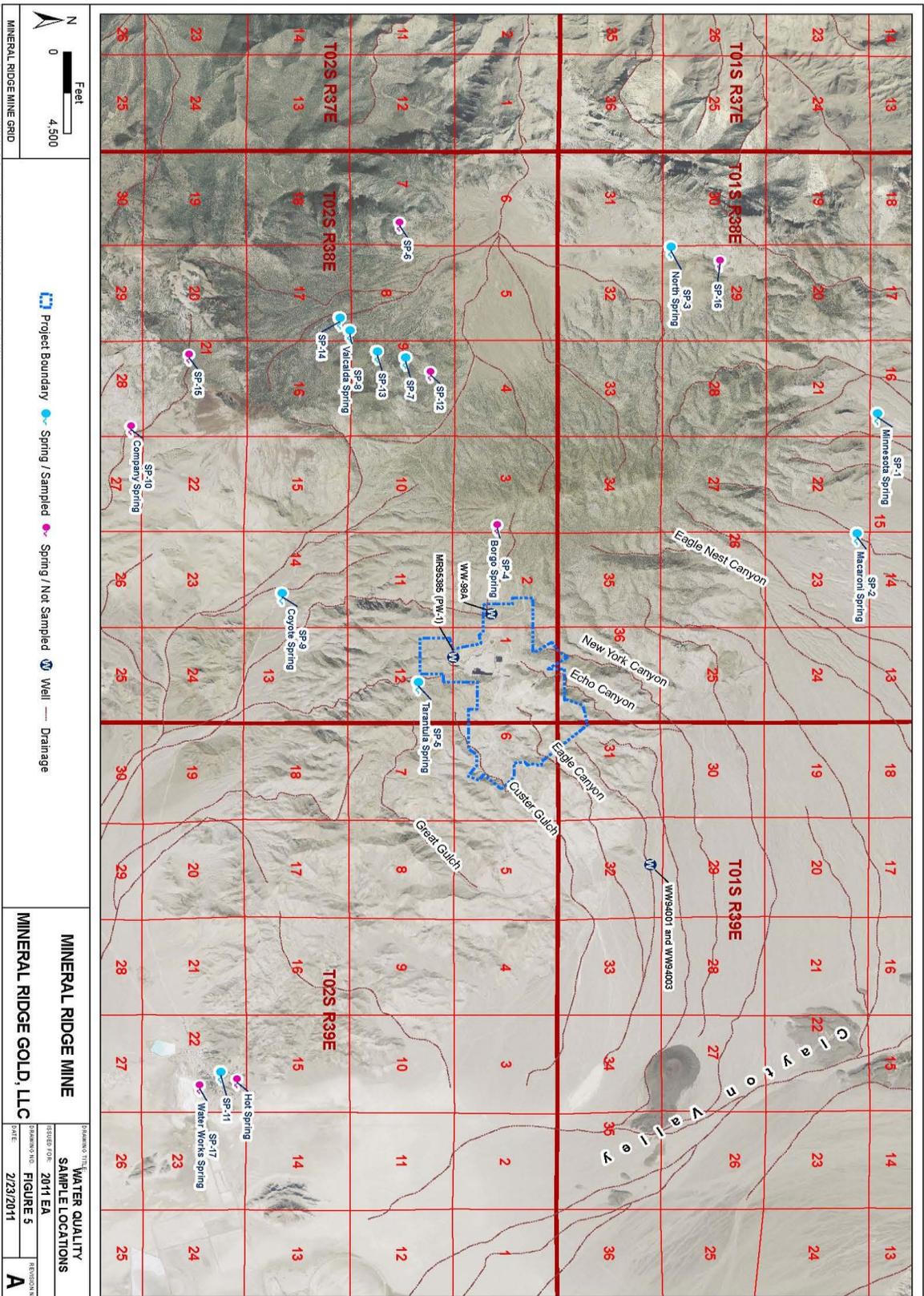
DRAWING TITLE
PROPOSED ACTIVITIES
 DESIGNED FOR: 2011 EA
 DRAWING NO.: FIGURE 3
 DATE: 2/23/2011
 REVISION NO.: A



--- Project Boundary
 - State of Nevada
 - Hydrographic Region
 - Hydrographic Basin
 - Hydrographic Area
 --- Drainage
 ● Water Well



MINERAL RIDGE MINE
MINERAL RIDGE GOLD, LLC
 HYDROGRAPHIC AREA BOUNDARIES
 2011 EA
 FIGURE 4
 DATE: 2/23/2011
 SHEET: A



MINERAL RIDGE MINE GRID

MINERAL RIDGE MINE

MINERAL RIDGE GOLD, LLC

MINERAL RIDGE MINE WATER QUALITY SAMPLE LOCATIONS

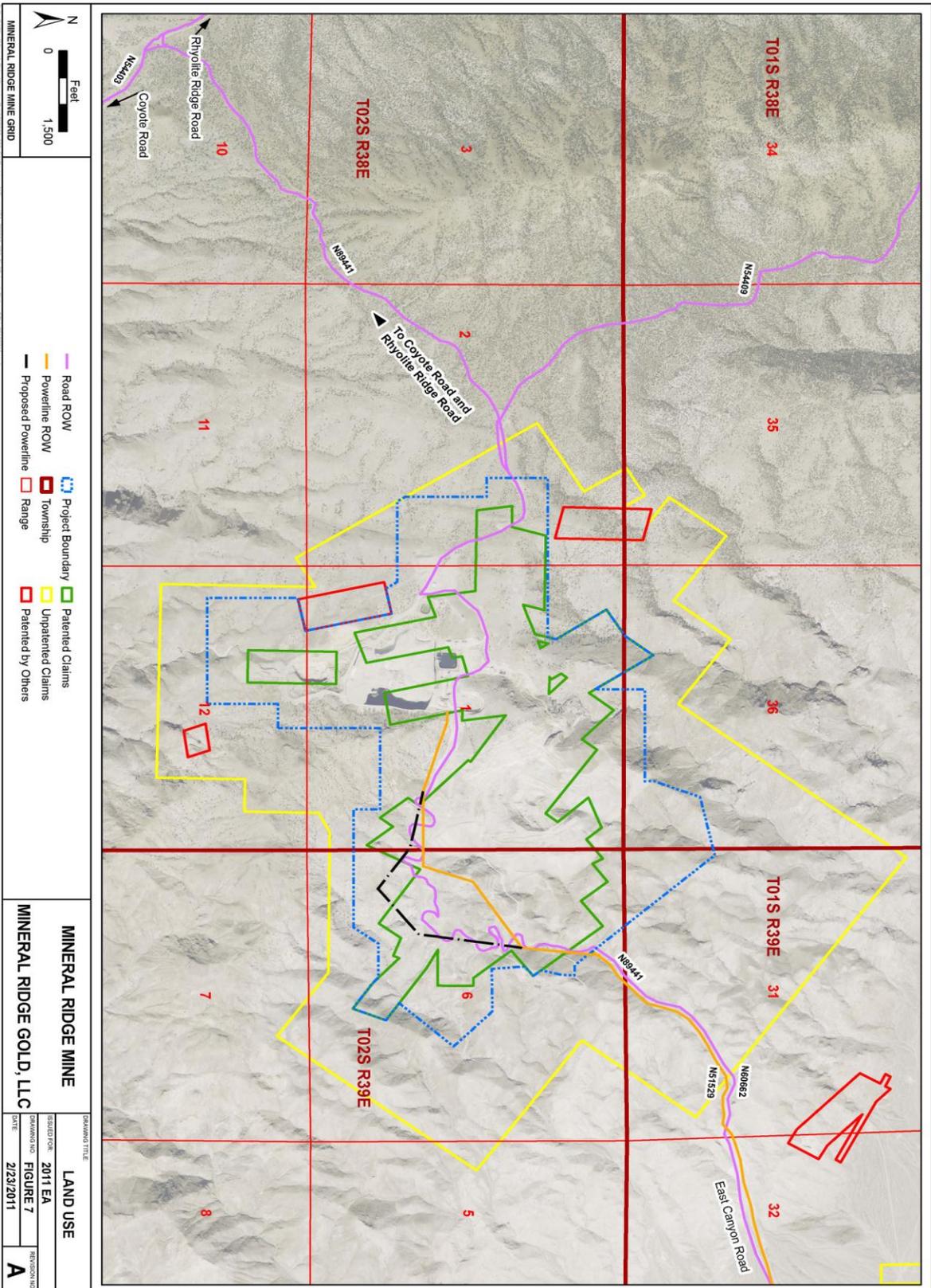
FIGURE 5

DATE: 2/23/2011

FIGURE NO. 2011 EA

REVISION NO.

REGION NO. A



MINERAL RIDGE MINE GRID

0 1,500 Feet

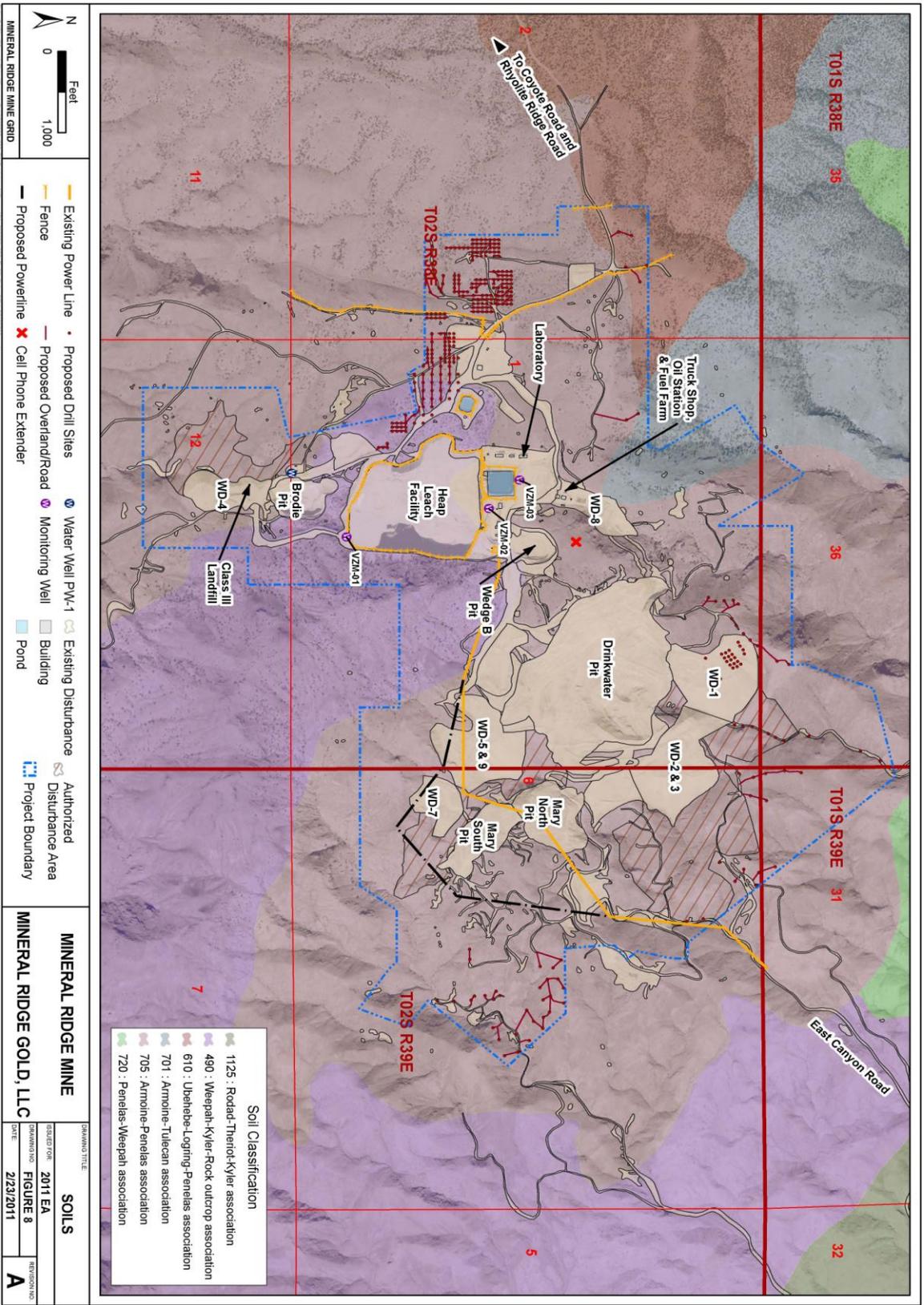
N

— Road ROW
— Powerline ROW
— Proposed Powerline
 Project Boundary
 Township
 Range
 Patented Claims
 Unpatented Claims
 Patented by Others

MINERAL RIDGE MINE

MINERAL RIDGE GOLD, LLC

DRAWING TITLE: LAND USE
 DESIGNED FOR: 2011 EA
 DRAWING NO: FIGURE 7
 DATE: 2/23/2011
 REVISION NO: A



Soil Classification

1125	: Rodad-Theriot-Kyler association
490	: Weepah-Kyler-Rock outcrop association
610	: Ubehebe-Loggins-Penelas association
701	: Armoine-Tulecan association
705	: Armoine-Penelas association
720	: Penelas-Weepah association

MINERAL RIDGE MINE

MINERAL RIDGE GOLD, LLC

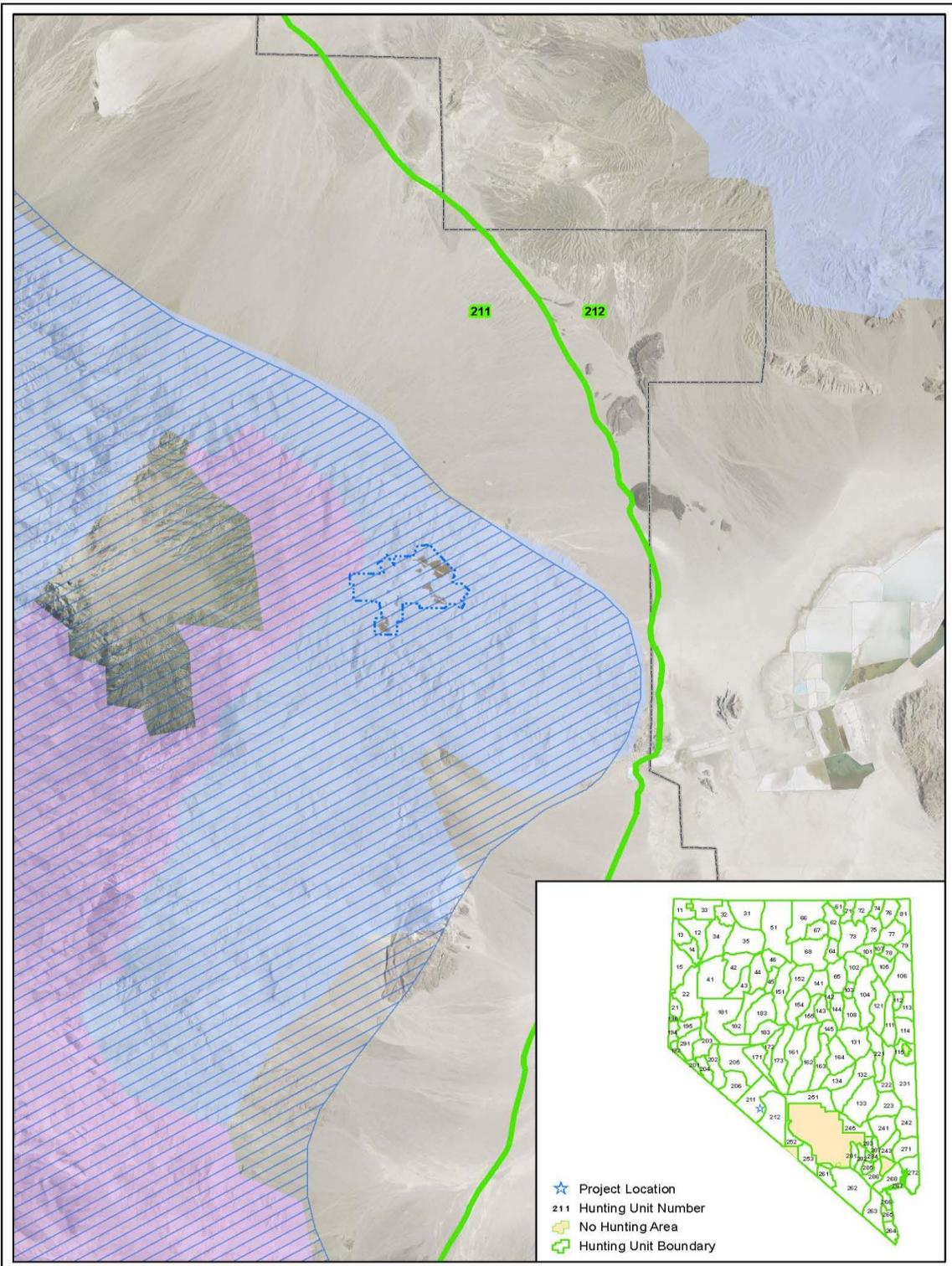
DATE: 2/23/2011

REVISION NO: A

MINERAL RIDGE MINE GRID

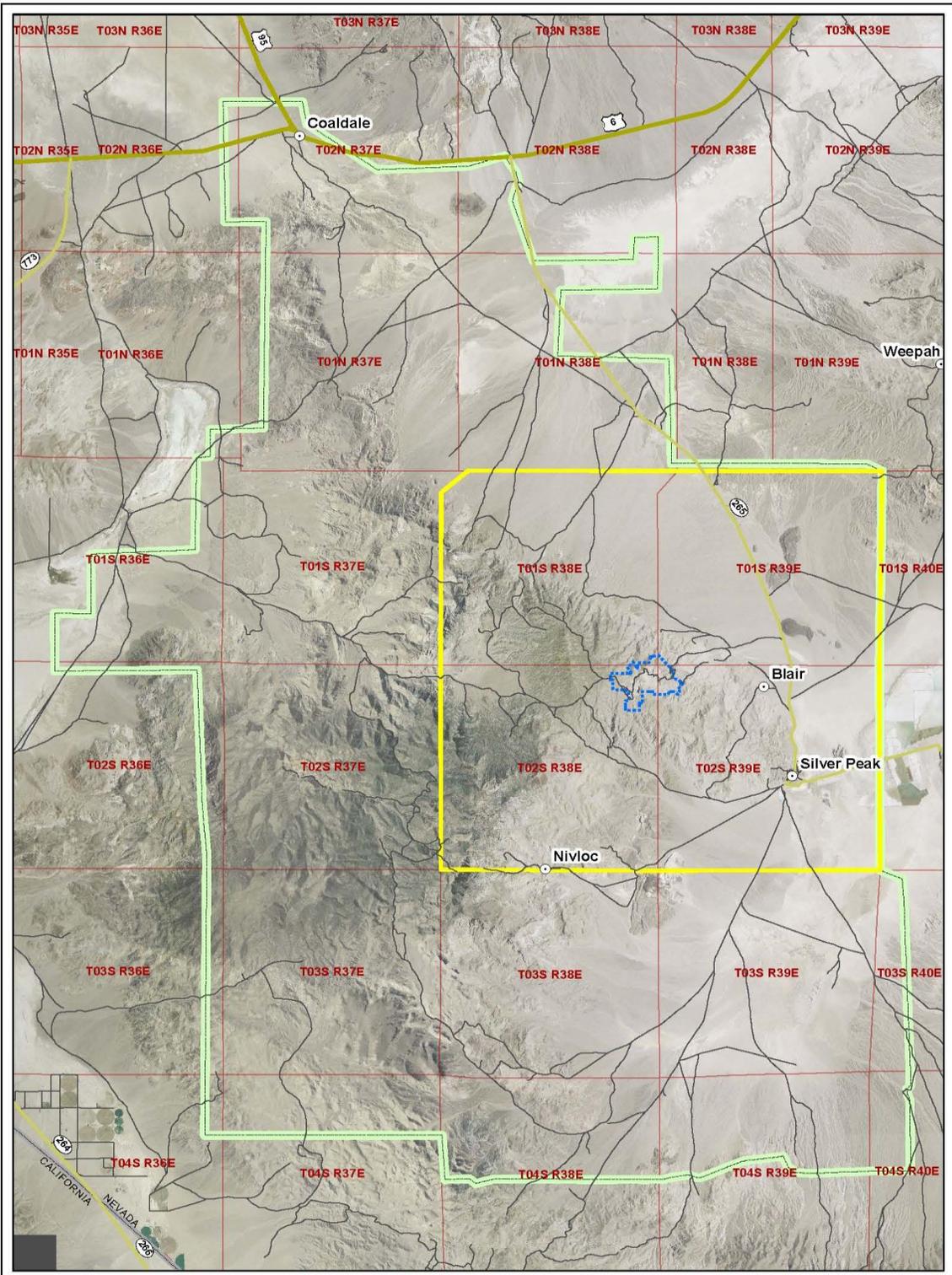
0 1,000 Feet

Existing Power Line
 Fence
 Proposed Powerline
 Proposed Drill Sites
 Proposed Overland/Road
 Cell Phone Extender
 Water Well PW-1
 Monitoring Well
 Building
 Pond
 Authorized Disturbance Area
 Project Boundary



 MINERAL RIDGE MINE GRID	Project Boundary	Silver Peak Allotment	Bighorn Sheep Habitat
	211 Hunting Unit Number	Year Round	Occupied
Hunting Unit Boundary	Mule Deer Habitat	Potential	

MINERAL RIDGE MINE		DRAWING TITLE: WILDLIFE	
MINERAL RIDGE GOLD, LLC		ISSUED FOR: 2011 EA	REVISION NO.:
		FIGURE 9	
		DATE: 2/23/2011	A



		Project Boundary	Town	Road
	Silver Peak Range CESA Boundary	Major Highway	State Boundary	Minor Highway
Silver Peak Allotment CESA Boundary				

MINERAL RIDGE MINE GRID

MINERAL RIDGE MINE
MINERAL RIDGE GOLD, LLC

DRAWING TITLE		CUMULATIVE EFFECTS STUDY AREAS	
ISSUED FOR:		2011 EA	
DRAWING NO:		FIGURE 10	
DATE:		2/23/2011	
REVISION NO.			A

Appendix A

**Water Quality Use Category Standards
and Surface Water Chemistry**

Water Use Standards

Standard Source	Standards ¹				
	Primary Drinking Water	Secondary Drinking Water	Municipal Supply	Irrigation	Livestock
	EPA	NAC 445A.455	NAC 445A.144	NAC 445A.144	NAC 445A.144
pH (s.u.)	-	6.5-8.5	-	-	-
Total Dissolved Solids	-	1000	-	-	-
WAD Cyanide	0.2	-	0.2	-	-
Alkalinity (Total as CaCO ₃)	-	-	-	-	-
Bicarbonate (HCO ₃ as CaCO ₃)	-	-	-	-	-
Boron	-	-	-	0.75	5
Calcium	-	-	-	-	-
Magnesium	-	150	-	-	-
Potassium	-	-	-	-	-
Sodium	-	-	-	-	-
Aluminum	-	0.2	-	-	-
Antimony	0.006	-	0.146	-	-
Beryllium	0.004	-	0	0.1	-
Chloride	-	400	-	-	-
Fluoride	4	-	-	-	-
Nickel	-	-	0.0134	-	-
Nitrate (No ₃ + NO ₂ as N)	10	-	-	-	-
Sulfate	-	500	-	-	-
Arsenic	0.01	-	0.05	0.1	0.2
Barium	2	-	2	-	-
Cadmium	0.005	-	0.005	0.01	0.05
Chromium	0.1	-	0.1	0.1	1
Copper	1.3	1	-	0.2	0.5
Iron	-	0.6	-	5	-
Lead	0.015	-	0.05	5	0.01
Manganese	-	0.1	-	0.2	-
Mercury	0.002	-	0.002	-	0.01
Selenium	0.05	-	0.05	0.02	0.05
Silver	-	0.1	-	-	-
Thallium	0.002	-	0.013	-	-
Zinc	-	-	-	2	25

¹Values are listed as ppm unless otherwise noted.

Surface Water Quality

Site	SP-1 Minnesota Spring	SP-2 Macaroni Spring	SP-3 North Spring	SP-5 Tarantula Spring	SP-5 Tarantula Spring	SP-7	SP-8 Valcalda Spring	SP-9 Coyote Spring	SP-11	SP-13	SP-14
Sample Date	3/16/95	3/16/95	3/15/95	9/30/94	3/15/95	3/14/95	3/14/95	3/14/95	3/16/95	3/14/95	3/14/95
Lab	-	-	-	-	-	-	-	-	-	-	-
Lab Reference	-	-	-	-	-	-	-	-	-	-	-
pH	7.84	8.26	6.94	7.56	7.82	7.17	7.45	7.67	7.88	7.41	7.76
Total Dissolved Solids	780	670	310	1852 ²	1760 ²	198	180	1190 ²	700	230	300
WAD Cyanide	<0.01	NA	<0.01	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Alkalinity (Total as CaCO ₃)	264	176	65	250	259	76	66	180	119	83	96
Bicarbonate (HCO ₃ as CaCO ₃)	322	215	79	NA	316	93	80	220	145	101	96
Boron	-	-	-	-	-	-	-	-	-	-	-
Calcium	110	13	0.69	205	190	6.20	24	260	99	28	3
Magnesium	51	27	1	185 ²	170 ²	1.6	5.2	30	26	5.5	7.2
Potassium	3.7	3.30	2.40	5.2	5.4	5.10	2.50	5.20	5	5.40	4.50
Sodium	59	51	62	90	80	41	30	600	200	35	36
Aluminum	<0.025	0.05	5.30 ²	NA	<0.025 ⁶	1.70 ²	0.09	0.65 ²	<0.025 ⁶	0.15	3.80 ²
Antimony	<0.005	<0.005	<0.005	<0.5 ⁶	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Beryllium*	<0.002	<0.002	<0.002	<0.05 ⁶	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chloride	68	56	30	120	120	14	30	66	150	35	40
Fluoride	0.19	0.18	0.39	<0.1	0.12	0.21	0.10	0.43	0.66	0.15	0.15
Nickel	<0.05	<0.05	<0.05	<0.5 ⁶	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate (No3 + NO2 as N)	<1	<1	<1	0.30	<1	<1	<1	<1	<1	1.20	<1
Sulfate	270	250	32	950 ²	880 ²	15	29	600 ²	200	35	36
Arsenic	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	<0.1	<0.1	<0.1	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	<0.001	<0.0005	<0.0005	<0.0002	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005
Chromium	<0.025	<0.025	<0.025	<0.05	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Copper	<0.025	<0.025	<0.025	<0.02	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Iron	<0.05	<0.05	4 ²	<0.02	<0.05	1.10 ²	0.14	0.72 ²	0.12	0.57	2.90 ²
Lead	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Manganese	<0.03	<0.03	0.04	<0.05	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	0.07
Mercury	<0.001	<0.001	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silver	<0.025	<0.025	<0.025	<0.0005	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Thallium	<0.0055 ⁶	<0.005 ⁶	<0.005 ⁶	<2.5 ⁶	<0.005 ⁶	<0.005 ⁶	<0.005 ⁶	<0.005 ⁶	<0.005 ⁶	<0.005 ⁶	<0.005 ⁶
Zinc	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

"<" preceding a number denotes that the result was below the stated laboratory reporting limit

* The municipal supply standard for beryllium is 0.

¹ Indicates exceedance of Primary Drinking Water standard (EPA)

² Indicates exceedance of Secondary Drinking Water standard (NAC 445A.455)

³ Indicates exceedance of Municipal or Domestic Supply standard (NAC 445A.144)

⁴ Indicates exceedance of Irrigation standard (NAC 445A.144)

⁵ Indicates exceedance of Watering of Livestock standard (NAC 445A.144)

⁶ Indicates that laboratory reporting limit was higher than one or more standards

Appendix B

Wildlife Species Which May Occur in the Project Area

This appendix includes lists of wildlife species which may occur within the Project Area. The lists have been compiled from the BLM bird, mammal, reptile, and amphibian species lists.

Birds

Common Name	Scientific Name
Turkey Vulture	<i>Cathartes aura</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Northern Harrier	<i>Circus cyaneus</i>
Swainson's Hawk	<i>Buteo swainsoni</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Ferruginous Hawk	<i>Buteo regalis</i>
Rough-legged Hawk	<i>Buteo lagopus</i>
Golden Eagle	<i>Aquila chrysaetos</i>
American Kestrel	<i>Falco sparverius</i>
Merlin	<i>Falco columbarius</i>
Prairie Falcon	<i>Falco mexicanus</i>
Cray Partridge	<i>Perdix perdix</i>
Chukar	<i>Alectoris chukar</i>
Sage Grouse	<i>Centrocercus urophasianus</i>
Mourning Dove	<i>Zenaida macroura</i>
Great Horned Owl	<i>Bubo virginianus</i>
Burrowing Owl	<i>Athene cunicularia</i>
Short-eared Owl	<i>Asio flammeus</i>
Long-eared Owl	<i>Asio otus</i>
Common Nighthawk	<i>Chordeiles minor</i>
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>
Northern Flicker	<i>Colaptes auratus</i>
Gray Flycatcher	<i>Epidonax wrightii</i>
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
Say's Phoebe	<i>Sayornis saya</i>
Western Kingbird	<i>Tyrannus verticalis</i>
Horned Lark	<i>Eremophila alpestris</i>
Barn Swallow	<i>Hirundo rustica</i>
Black-billed Magpie	<i>Pica pica</i>
American Crow	<i>Corvus brachyrhynchos</i>
Common Raven	<i>Corvus corax</i>
Rock Wren	<i>Salpinctes obsoletus</i>
Mountain Bluebird	<i>Sialia currucoides</i>
American Robin	<i>Turdus migratorius</i>
Sage Thrasher	<i>Oreoscoptes montanus</i>

Loggerhead Shrike	<i>Lanius ludovicianus</i>
Northern Shrike	<i>Lanius excubitor</i>
European Starling	<i>Sturnus vulgaris</i>
Brewer's Sparrow	<i>Pooecetes gramineus</i>
Vesper Sparrow	<i>Chondestes grammacus</i>
Lark Sparrow	<i>Amphispiza belli</i>
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Lapland Longspur	<i>Calcarius lapponicus</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Western Meadowlark	<i>Sturnella neglecta</i>
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
Brown-headed Cowbird	<i>Molothrus ater</i>
Black Rosy Finch	<i>Leucosticte atrata</i>
House Finch	<i>Carpodacus mexicanus</i>
Gray-crowned Rosy Finch	<i>Leucosticte tephrocotis</i>
House Sparrow	<i>Passer domesticus</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>

Mammals

Common Name	Scientific Name
Little Brown Bat	<i>Myotis lucifugus</i>
Long-eared Myotis	<i>Myotis evotis</i>
Fringed Myotis	<i>Myotis thysanodes</i>
Yuma Myotis	<i>Myotis yumanensis</i>
Pallid Bat	<i>Antozous pallidus</i>
California Myotis	<i>Myotis californicus</i>
Long-legged Myotis	<i>Myotis volans</i>
Small-footed Myotis	<i>Myotis ciliolabrum</i>
Western Pipistrelle	<i>Pipistrellus hesperus</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Townsend's Big-eared Bat	<i>Plecotus townsendii</i>
Brazilian Free-tailed Bat	<i>Tadarida brasiliensis</i>
Black-tailed Jackrabbit	<i>Lepus californicus</i>
Mountain Cottontail	<i>Sylvilagus nuttallii</i>
Pygmy Rabbit	<i>Sylvilagus idahoensis</i>
Townsend's Ground Squirrel	<i>Spermophilus townsendii</i>
Belding Ground Squirrel	<i>Spermophilus beldingi</i>
White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
Least Chipmunk	<i>Tamias minimus</i>

Botta's Pocket Gopher	<i>Thomomys bottae</i>
Northern Pocket Gopher	<i>Thomomys talpoides</i>
Little Pocket Mouse	<i>Perognathus longimembris</i>
Great Basin Pocket Mouse	<i>Perognathus parvus</i>
Dark Kangaroo Mouse	<i>Microdipodops megacephalus</i>
Ord Kangaroo Rat	<i>Dipodomys ordii</i>
Chisel-toothed Kangaroo Rat	<i>Dipodomys microps</i>
Deer Mouse	<i>Peromyscus maniculatus</i>
Northern Grasshopper Mouse	<i>Onychomys leucogaster</i>
Desert Woodrat	<i>Neotoma lepida</i>
Sagebrush Vole	<i>Lemmiscus curtatus</i>
House Mouse	<i>Mus musculus</i>
Kit Fox	<i>Vulpes macrotis</i>
Coyote	<i>Canis latrans</i>
Long-tailed Weasel	<i>Mustela frenata</i>
Badger	<i>Taxidea taxus</i>
Striped Skunk	<i>Mephitis mephitis</i>
Mountain Lion	<i>Felix concolor</i>
Bobcat	<i>Lynx rufus</i>
Mule Deer	<i>Odocoileus hemionus</i>
Pronghorn	<i>Antilocapra Americana</i>
Desert Bighorn Sheep	<i>Ovis canadensi nelsoni</i>

Reptiles

Common Name	Scientific Name
Western Skink	<i>Eumeces skiltonianus</i>
Western Whiptail	<i>Cnemidophorus tigrus</i>
Desert Collared Lizard	<i>Crotaphytus insularis</i>
Long-nosed Leopard Lizard	<i>Gambelia wislizenii</i>
Desert Spiny Lizard	<i>Sceloporus magister</i>
Sagebrush Lizard	<i>Sceloporus graciosus</i>
Western Fence Lizard	<i>Sceloporus occidentalis</i>
Side-blotched Lizard	<i>Uta stansburiana</i>
Desert Horned Lizard	<i>Phrynosorna platyrhinos</i>
Short-horned Lizard	<i>Phrynosorna douglassii</i>
Long-nosed Snake	<i>Rhinocheilus lecontei</i>
Ground Snake	<i>Sonora semiannulata</i>
Night Snake	<i>Hypsiglena torquata</i>
Gopher Snake	<i>Pituophis melanoleucus</i>
Racer	<i>Coluber constrictor</i>

Striped Whipsnake
Western Rattlesnake

Masticophis taeniatus
Crotalus viridi