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Bureau of Land Management

News Release

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BLM Completes Initial Environmental Review on Proposed Gold Bar Mine

BATTLE MOUNTAIN – Today the Bureau of Land Management released its draft Environmental Impact Statement (DEIS) for a proposed open-pit gold mine 30 miles northwest of Eureka, Nevada, which could create 120 new jobs in the area.

For the next 45 days, the BLM is seeking public input on the initial analysis that will be used in developing a final decision on how the project will move forward.

McEwen Mining Inc.'s Gold Bar Mine Project proposal encompasses a project area of 5,362 acres of public land and 199 acres of private land located in the southwest portion of the Roberts Mountains. The actual surface disturbance proposed is approximately 20 percent of the project area, totaling nearly 1,130 acres, of which 944 acres are managed by the BLM.

After receiving the mine proposal, the BLM began its scoping process by reaching out to the public in 2015 to gather information related to the project. That information was used to develop the DEIS released today.

The DEIS includes four alternatives that examine the mine's range of potential impacts to natural resources in the area, such as water resources, air quality, vegetation, wildlife, livestock grazing, recreation and cultural resources.

The BLM is now asking the public to review the DEIS and provide substantive comments to help shape the final environmental analysis that will be used to guide the BLM's decision whether or not to authorize the mine and how to best manage the variety of resources potentially affected.

A public meeting is scheduled in Eureka, Nevada, on March 22, 2017, from 6 p.m. to 8 p.m. at the Eureka Opera House, 31 South Main Street, Eureka, Nevada. BLM specialists will be available to provide information and answer questions about the proposed project.

The DEIS is available online at http://bit.ly/2gyfZms. Interested individuals should address all written comments to Christine Gabriel, Project Manager, using any of the following ways:

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Mail: Bureau of Land Management
Mount Lewis Field Office
50 Bastian Road
Battle Mountain, NV 89820

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

-BLM-

The BLM manages more than 245 million acres of public land, the most of any Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 Western states, including Alaska. The BLM also administers 700 million acres of sub-surface mineral estate throughout the nation. The BLM's mission is to manage and conserve the public lands for the use and enjoyment of present and future

generations under our mandate of multiple-use and sustained yield. In Fiscal Year 2015, the BLM generated $4.1 billion in receipts from activities occurring on public lands.

BLM

Gold Bar Mine Project

DRAFT ENVIRONMENTAL IMPACT STATEMENT
VOLUME I

Case File NVN-091037 | March 2017

U.S. Department of the Interior Bureau of Land Management
Mount Lewis Field Office
Battle Mountain District
50 Bastian Road
Battle Mountain, NV 89820

Cooperating Agencies:
The Eureka County Board of Commissioners
The National Park Service
The Nevada Department of Wildlife
The United States Fish and Wildlife Service
The United States Environmental Protection Agency, Region 9

BLM Mission Statement

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

DOI-BLM-NV-B010-2015-0010-DEIS

Draft
Environmental Impact Statement
for the Gold Bar Mine Project

(X) Draft	**( )Final**
Lead Agency:	U.S. Department of the Interior Bureau of Land Management Mount Lewis Field Office
Cooperating Agencies:	Eureka County Board of Commissioners Nevada Department of Wildlife National Park Service United States Fish and Wildlife Service Environmental Protection Agency, Region 9
Counties Directly Affected:	Eureka County, Nevada
Date EIS Filed with EPA:	February 24, 2017
Comments on the EIS can be Directed to:	Christine Gabriel, EIS Project Manager Bureau of Land Management Mount Lewis Field Office 50 Bastian Road Battle Mountain, Nevada 89820 blm_nv_bmdo_mlfo_gold_bar_project_eis@blm.gov
Comments must be received by:	April 17, 2017

ABSTRACT

This Draft Environmental Impact Statement (EIS) analyzes the potential direct, indirect, and cumulative impacts associated with McEwen Mining Inc.'s proposal to construct and operate the Gold Bar Mine Project. The proposed Project's total surface disturbance would be 1,129 acres located on both BLM-administered lands (946 acres) and private land (183 acres). Proposed activities would consist of open pits, heap leach pads, waste rock dumps, and ancillary facilities. Activities would occur on both existing disturbance and new disturbance.

In addition to the proposed Project, four Alternatives are analyzed including: the 25kV Overhead Distribution Line Alternative, the Three Bars Road/Atlas Haul Road as Only Access Alternative, the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative, and the No Action Alternative. Development of alternatives focused on reducing impacts to greater sage-grouse habitat.

The actions involved in the decision to be made by United States Department of the Interior, BLM includes authorization of the Gold Bar Plan of Operations (NVN-091037).

Authorized Officer Responsible for the Draft Environmental Impact Statement:

Jon D. Sherve
Field Manager
Mount Lewis Field Office
Bureau of Land Management

EXECUTIVE SUMMARY

Executive Summary

Introduction

The following sections summarize the Draft Environmental Impact Statement (DEIS) for the Gold Bar Mine Project (Project). This information is provided as a synopsis for the public, but it is not a substitute for the review of the complete DEIS. The document is structured into six chapters and one appendix section. The document structure is as follows: Chapter 1 provides an introduction to the Project; Chapter 2 describes the Proposed Action and alternatives; Chapter 3 discusses the affected environment and identifies each resource examined in the DEIS; Chapter 4 discloses the environmental consequences, and the potential impacts to the resources including cumulative effects occurring from past, present, and reasonably foreseeable future actions when combined with the Proposed Action and alternatives; Chapter 5 discusses the consultation and coordination that was conducted during the DEIS process, including a description of the scoping process and a list of preparers and reviewers; and Chapter 6 includes the references, glossary and index.

The Gold Pick and Gold Ridge satellite deposits were mined by the Atlas Corporation between 1986 and 1994, and included the construction of open pits, waste rock disposal areas (WRDAs), and extensive exploration disturbance. The area was abandoned in 1999 when the Atlas Corporation filed for bankruptcy, leaving nearly 654 acres of unreclaimed disturbance within the proposed Project boundary. The Project would utilize approximately 395 acres of this existing unreclaimed disturbance, including the existing disturbance associated with North Roberts Creek Road (NVN-052399), for which McEwen Mining Inc. (MMI) would assume full reclamation liability. MMI has been conducting exploration activities within the Project boundary and is currently responsible for reclamation of the associated disturbances. Exploration has been conducted under five Bureau of Land Management (BLM) notices in accordance with 43 Code of Federal Regulations (CFR) 3809.300 et seq. These notices have authorized approximately 16 acres of exploration related disturbance. Exploration activities have consisted of drill roads and pad construction, surface sampling, trenching, bulk sampling, and drilling. Exploration activities have also included geotechnical investigations, geophysical surveys, water exploration, and monitor well installation. Upon approval of the Plan of Operations (Plan) and issuance of a Record of Decision, these notices would be incorporated into the Plan and officially closed. MMI has also submitted an amendment to Notice of Intent NVN 086229 to conduct an investigation of a clay resource for use as a clay liner for the heap leach pad (HLP). This investigation would include eight geotechnical borings and eight shallow trenches that would be entirely within the proposed Cabin Creek pit footprint.

MMI submitted a Plan to the BLM in December 2013, revised it in February 2014, December 2015, and May 2016 (MMI, 2016a). Total proposed Project disturbance would be approximately 1,129 acres, which includes both proposed new disturbance and existing disturbance that would be incorporated into the Project, with approximately 946 acres on public land administered by the BLM Mount Lewis Field Office and 183 acres on private land. The Plan boundary encompasses 5,362 acres of public land and 199 acres of private land.

This Environmental Impact Statement (EIS) is being prepared by the BLM in coordination with the cooperating agencies as part of the review process of the Plan, and follows Council on Environmental Quality regulations at 40 CFR 1500 *et seq.* that implement the National Environmental Policy Act of 1969.

Proposed Action

The Proposed Action to be evaluated in the EIS includes an open pit gold mine, a water pipeline, and access roads. The Project would consist of:

- Four open pits;
- WRDAs;
- Crushing, screening, and agglomeration facilities;
- HLP, associated process solution pond, and an event pond;
- An adsorption, desorption, and recovery plant including barren and pregnant solution tanks;
- Ancillary and other facilities including:
    - Explosive storage area;
    - Prill silos;
    - Liquid natural gas (LNG) Cryostorage, or compressed natural gas (CNG) generators and switch station;
    - Truck shop and wash bay;
    - Ready line;
    - Landfill, laydown areas;
    - Water and power infrastructure;
    - Buildings;
    - Yards;
    - Parking;
    - Storage;
    - Growth media stockpiles;
    - Production water wells (GBPW-210 and GBPW-211) and associated water supply pipeline;
    - Groundwater monitoring wells (GBMW-01, GBMW-03, and GBMW-04);
    - Communication facilities;
    - Potable water and fire water facilities;
    - Septic systems, and fencing;
- Mine access roads:
    - Three Bars Road;
    - Atlas Haul Road;
    - North Roberts Creek Road (NVN-052399);
    - Bypass Road (NVN-91566); and
    - Roberts Creek Road.

Heavy vehicle traffic would access the Plan boundary from United States (U.S.) Highway 50 by traveling north on the existing Three Bars Road for approximately 16 miles, and then east for 1.5 miles on the existing Gold Bar Road to the former Atlas Mill area. From the former mill area, access is gained to the east on the existing Atlas Haul Road for approximately seven miles to the mine facilities.

Employees would be transported to the mine facilities using three, 12- to 15-passenger vans. Vans, pickup trucks, and automobiles are considered light vehicle traffic. Light vehicle traffic access to the mine facilities would be from U.S. Highway 50 and traveling north on the existing Roberts Creek Road for approximately 13 miles, then west on the Bypass Road for approximately one mile to North Roberts Creek Road, then northeast on North Roberts Creek Road for 0.6 mile, then northwest on North Roberts Creek Road for 1.5 miles to the proposed mine facilities. The Project does not propose any improvements to Three Bars Road (including Atlas Haul Road), Roberts Creek Road, or Bypass Road. MMI would improve the existing North Roberts Creek Road to 60 feet in width, which would be consistent with the width of the Bypass Road and Roberts Creek Road.

Seasonal timing restrictions are incorporated into the use of access roads to the Project. These seasonal restrictions would be implemented to reduce impacts to greater sage-grouse leks within four miles of the two access routes to the Project (i.e., Three Bars Road access routes and the Roberts Creek Road access route) during lekking season. Project-related traffic on Three Bars Road and Roberts Creek Road would be subject to seasonal timing restrictions from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. These restrictions do not apply to local or emergency traffic.

The Project power supply would be provided by a series of three natural gas (LNG or CNG) self-contained generators (two operating and one backup), two 2,175 boiler horse power (1,442 kilowatt [kW] site rating), and one 1,716 boiler horse power (1,083 kW site rating).

25 kV Overhead Distribution Line Alternative

A 25 kilovolt (kV) power distribution line was considered as an alternative means to supply power to the Project, as opposed to the on-site LNG/CNG generators proposed in the Plan. The proposed distribution line would consist of the construction and operation of approximately 25 miles of new 25 kV overhead distribution line, and five miles of existing power distribution line (Atlas 25 kV line) to supply the needed power for Project operations. The power would be supplied by Mt. Wheeler Power, Inc. (Mt. Wheeler) to whom the necessary BLM right-of-way (ROW) would be granted. The new overhead distribution line would extend from the existing Machacek Substation located on BLM managed lands west, then north adjacent to the existing Falcon-Gonder 345 kV transmission line to the existing Atlas 25 kV overhead distribution line. At this intersection, the proposed new 25 kV overhead distribution line would tap the existing Atlas 25 kV overhead line. From there, the existing line would be utilized for approximately 4.75 miles west to a tap point on North Roberts Creek Road. At this location, a new segment of 25 kV overhead distribution line would extend northwest along North Roberts Creek Road

approximately 7.5 miles to the mine site. The proposed power distribution line would require an 80-foot wide temporary construction ROW, and a 40-foot wide permanent operation and maintenance ROW.

Access to the power distribution line corridor would be through existing roads along the corridor and through existing roads by the Machacek Substation. A centerline access road is proposed in the permanent ROW to provide access during construction and maintenance. Proposed disturbance associated with the power distribution line and access road would occur within the 40-foot permanent ROW. Both the 80-foot temporary construction ROW and the 40-foot permanent operation and maintenance ROW include a cultural avoidance area where no disturbance can occur. Total potential disturbance associated with the 40-foot permanent operation and maintenance ROW (not including the cultural avoidance area) would be 130 acres, with 124 acres of disturbance on BLM administered public land and six acres on private land. Total disturbance associated with the 80-foot temporary construction ROW (not including the cultural avoidance area) would be 246 acres, with 235 acres on BLM administered public land and 11 acres on private land.

Three Bars Road/Atlas Haul Road as Only Access Alternative

An alternative to the Plan was considered to use Three Bars Road and Atlas Haul Road as the only means of access for both heavy and light vehicle traffic to the mine facilities. Under this alternative, Three Bars Road and Atlas Haul Road would be the only route used to access the Project area and mine facilities. There would be no other access. Traffic under this alternative would be subject to the same seasonal timing restrictions as specified for the Proposed Action, which would consist of seasonal timing restrictions from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. No improvements would be made to Three Bars Road or Atlas Haul Road to implement this alternative, and the proposed disturbance would remain the same as the Proposed Action. Under this alternative, North Roberts Creek Road would still be improved to allow for all-weather access along the water pipeline to the wells. This alternative was considered to reduce environmental impacts resulting from using two access routes, particularly impacts to greater sage-grouse leks within four miles of the proposed Roberts Creek Road access route even though the travel distance for light vehicle traffic would increase by 20 miles. There is no change in the amount of surface disturbance compared to the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

An alternative to accessing the mine facilities was considered for light vehicle traffic to use the authorized Mount Hope Access Road and well field road as access to the Plan boundary. This alternative would require light vehicle traffic to use State Route 278 to the Mount Hope Access Road, and then use the Mount Hope well field road to access Roberts Creek Road. The Bypass Road (NVN-91566) and North Roberts Creek Road would be used from that point to access the Plan boundary. Heavy vehicle traffic would use Three Bars Road and the Atlas Haul Road, the same as the Proposed Action. Traffic under this alternative would be subject to the same

seasonal timing restrictions as specified for the Proposed Action, including the Mount Hope access road and well field road, which would consist of seasonal timing restrictions from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. Proposed disturbance for this alternative would be the same as the Proposed Action. All improvements to the Mount Hope Access Road would be within the previously authorized disturbance area for the Mount Hope project. This alternative was considered to reduce environmental impacts resulting from using a longer stretch of Roberts Creek Road for light vehicle traffic, particularly impacts to greater sage-grouse leks within four miles of the proposed Roberts Creek Road access route.

No Action Alternative

Under the No Action Alternative, the MMI Plan would not be authorized by BLM and the activities described in the Proposed Action would not occur. Mineral resources would remain undeveloped and the construction and operation of the proposed mining and mineral beneficiation facilities would not occur. The 654 acres of existing disturbance from past mining operations within the Project mine boundary would remain unreclaimed. The reclamation plan associated with the Proposed Action would not be implemented, and no revegetation or recontouring of existing disturbances to match the natural topography would occur. MMI may continue exploration efforts that are already approved (approximately 16 acres of disturbance).

Introduction to Resource Impacts

In Chapter 4 of this DEIS, the environmental consequences of the Proposed Action are evaluated and compared to the Action Alternatives and No Action Alternative. The primary environmental impacts for the Proposed Action and Alternatives are outlined in Chapter 4. The section below provides a summary of the potential impacts from the implementation of the Proposed Action and Action Alternatives.

Air Quality

Proposed Action

Project-related activities have the potential to affect air quality in the vicinity of the Project. The Proposed Action involves area source emissions. These include fugitive emissions from drilling, blasting, loading, unloading, wind erosion, haul roads, and dozing. Also included are tailpipe emissions from equipment and haul road vehicles. The Project has the potential to increase emissions of criteria air pollutants (i.e., particulate matter less than 10 microns [PM_{10}], sulfur dioxide, nitrogen oxides, carbon monoxide) for the short-term (lasting through the end of mining) and would be within Nevada Ambient Air Quality Standards and the National Ambient Air Quality Standards. Following the completion of mining and subsequent reclamation, air quality would return to background levels determined by emissions from other regional source operations and/or natural background pollutant concentrations; therefore, impacts to air quality are considered to be short-term, localized, and with no substantial adverse effects.

Potential changes to the Project area resulting from the effects of climate change forecasted by the Central Basin and Range Rapid EcoRegional Assessment could include higher than normal growing season temperatures, contraction or expansion of some existing vegetation communities, the expansion of existing noxious weed populations, and the introduction of noxious weeds previously undocumented in the ecoregion and Project area (Comer et al., 2013).

Annual emissions of greenhouse gases (GHG) from construction and operations sources are directly related to the consumption of fuels (combustion). The Project would provide its own power using generators so there would be no indirect contribution to GHG emissions at the power plants that furnish power to the grid due to the Project. GHG emissions for the Project are generated from direct combustion of fossil fuels including diesel, LNG, and gasoline by process sources, insignificant sources, and mobile mining equipment. GHG emissions would contribute cumulatively to global annual GHG emissions. Per the Environmental Protection Agency (EPA) GHG Equivalencies Calculator, the Proposed Action would produce approximately the same amount of GHG emissions annually as that produced by 16,399 households annually from energy consumption.

25 kV Overhead Distribution Line Alternative

From an air pollutant emissions perspective, the 25 kV Overhead Distribution Line Alternative, would remove emissions associated with the generators from the Proposed Action and add fugitive and tailpipe emissions from the access road for distribution line construction and maintenance, which are expected to be minimal. The result would be a reduction in direct criteria air pollutant and GHG emissions and, to a lesser extent, an increase in indirect emissions. Overall emissions are expected to be lower than for the Proposed Action, but impacts are anticipated to be short-term, localized, with no substantial adverse effects.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. From an air pollutant emissions perspective, this alternative would be similar to the Proposed Action except all the light vehicle traffic fugitive dust and tailpipe emissions would be concentrated on Three Bars Road/Atlas Haul Road instead of Roberts Creek Road. This alternative is estimated to generate a slightly higher amount of facility-wide emissions than the Proposed Action; however, the impact would still be considered short-term, localized, with no substantial adverse effects. This alternative differs from the Proposed Action only with respect to the different access road configurations. However, GHG emissions are anticipated to slightly increase from the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. From an air pollutant emissions perspective, this alternative would be similar to the Proposed Action, except fugitive dust and tailpipe emissions would occur at the Mount Hope well field road rather than Roberts Creek Road. The Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative is estimated to generate approximately the same amount of facility-wide emissions as the Proposed Action. This alternative is estimated to generate slightly less facility-wide emissions as the Proposed Action; however, the impact would still be considered short-term, localized, with no substantial adverse effects.. This alternative differs from the Proposed Action only with respect to the different access road configurations. However, GHG emissions for this alternative are anticipated to slightly decrease from the Proposed Action.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. The existing conditions would include the existing approximately 654 acres of disturbance from the previous Atlas mining operations. Since the Project would not be approved under the No Action Alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action). There would be no direct emissions of criteria air pollutants (except for $PM/PM_{10}/PM_{2.5}$) or GHG pollutants. Potential fugitive dust impacts from the existing disturbance may continue to occur under this alternative. Impacts to air quality from this alternative are expected to be short-term, localized, with no substantial adverse effects.

Cultural Resources

Proposed Action

Based on the Class III inventories, a total of 16 prehistoric sites, 45 historic sites, and 15 multi-component sites were identified in the direct effects area of potential effect (APE). Of the 16 prehistoric sites and 15 prehistoric components, three of the prehistoric sites and eight of the prehistoric components were recommended as eligible for the National Register of Historic Places (NRHP). The remaining prehistoric sites and prehistoric components were recommended as not eligible. Of the 45 historic sites and 15 historic components, 33 historic sites and 10 historic components were recommended as eligible for the NRHP. The remaining sites and historic components were recommended as not eligible for the NRHP. All of the NRHP-eligible sites (i.e., historic properties) within the APE potentially would be impacted by the Proposed Action, from ground disturbance, blasting vibrations, construction of haul roads and ancillary facilities, storm water runoff, and visual or auditory disruption to the character and setting of the area.

In consultation with the Nevada State Historic Preservation Office (SHPO), the BLM would determine whether construction and operation of the Project would have an adverse effect on any historic properties. If the BLM determines that a property would be adversely affected, then avoidance would be recommended. If avoidance is not feasible, measures to minimize or mitigate effects would be proposed in accordance with a Memorandum of Agreement (MOA) and detailed in a Historic Preservation and Treatment Plan (HPTP) developed in coordination with the SHPO. For those cultural resources that do not meet the criteria of NRHP eligibility, but may be significant to Native American tribes (e.g., sacred sites), the BLM, in consultation with interested tribes would determine the appropriate means to avoid, minimize, or mitigate impacts on a case-by-case basis.

Direct effects to historic properties, including unanticipated discoveries, would be minimized, or mitigated in accordance with the MOA, HPTP, Environmental Protection Measures (EPMs), and any additional mitigation measures determined by the BLM in consultation with the SHPO. Indirect effects such as illegal collecting and/or inadvertent damage potentially would occur because of increased human activity in the Project area. Under the Proposed Action, direct and indirect effects to historic properties are anticipated to be result in no adverse effect.

25 kV Overhead Distribution Line Alternative

Impacts to the resources within the Plan boundary would be the same as those described under the Proposed Action. However, in addition, 21 sites are located within the 25kV overhead distribution line including three prehistoric-era sites, 15 historic-period sites, and three multi-component sites. Of these, one prehistoric site, one prehistoric component, and one historic site are recommended eligible for the NRHP. These NRHP-eligible sites and components (i.e., historic properties) potentially would be impacted by this alternative. The types of direct and indirect impacts to these historic properties that could occur under the 25 kV Overhead Distribution Line Alternative would be the same as those described for the Proposed Action, so impacts would be localized, short-term, and would result in no adverse effect with the implementation of the MOA

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action: localized, short-term, and would result in no adverse effect with the implementation of the MOA.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action: localized, short-term, and would result in no adverse effect with the implementation of the MOA.

No Action Alternative

Under the No Action Alternative, no impacts to historic properties as identified for the Proposed Action would occur. However, seven prehistoric sites, 11 historic sites, and seven multi-component sites have been identified within the area of authorized Notice-level exploration activities. Of these 25 cultural resources, 10 historic sites, two prehistoric sites, and seven multi-component sites are recommended as eligible for the NRHP. Although exploration activities are exempt from Section 106, these activities fall under the purview of BLM's standard stipulations issued for exploration activities. The stipulations detail the penalties if any unnecessary or undue degradation to cultural resources on federal lands should occur, and additionally detail the actions to be taken in the event cultural resources, including human remains, funerary objects, and sacred items, are discovered during the activities. With implementation of and compliance with BLM's standard stipulations issued for exploration activities, adverse effects to historic properties, including unanticipated discoveries, would not be anticipated under this alternative. Impacts are anticipated to be localized, short-term, and would result in no adverse effect.

Environmental Justice

Proposed Action

The Proposed Action would not be expected to disproportionately affect any particular population. The minority and low income populations within the area of analysis are not meaningfully greater than in Eureka County or the State of Nevada. Environmental effects may occur at a distance from the Project area, such as noise or air quality impacts, would affect the area's population equally, without regard to nationality or income level, so impacts to environmental justice would be negligible.

25 kV Overhead Distribution Line Alternative

Impacts from the 25 kV Overhead Distribution Line Alternative would be the same as the Proposed Action.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. Impacts to an environmental justice population are anticipated to be negligible.

Forest Products

Proposed Action

Direct impacts of the Proposed Action would include removal of approximately 649 acres of woodland communities (e.g., 167 acres of curl-leaf mountain mahogany woodland and 482 acres pinyon-juniper woodland). Loss of woodland species would result from construction of process facilities and ponds, shop facilities, administration buildings, laydown yards, pit excavations, WRDAs, HLP, growth media stockpiles, landfill, sediment basins, and improvement or construction of roads. Most disturbance would come from the WRDAs, open pits, and the HLP. Impacts to woodland communities would last 50 to 100 years until woodland species succeed (gradually replace) species planted during reclamation.

None of the woodland or forest community types within the Plan boundary are considered unique or rare. These tree-dominated communities are prevalent in areas adjacent to the Project and throughout central Nevada. Disturbed areas would be reclaimed after mining to a grass and forb dominated community, and eventually a shrub dominated community depending on success of reclamation. This vegetation community is abundant on public lands in the area surrounding the Proposed Action. The direct impact of removal of woodland species and impacts to access for woodland harvesting would be localized, long-term, and minor.

25 kV Overhead Distribution Line Alternative

In addition to the impacts to woodland products from mining and processing facilities, the 40-foot wide operation and maintenance ROW associated with the 25 kV Overhead Distribution Line Alternative would directly remove an additional approximately eight acres of pinyon-juniper woodland. The 80-foot wide temporary construction ROW would remove and additional approximately 16 acres of pinyon-juniper woodland. However, the 80-foot wide temporary construction ROW is to be used during the six-month construction schedule for staging equipment and storing materials, and it is unlikely that woodland products would be removed. The loss of these acres would reduce the number of trees available for pine nut harvest, fuel wood cutting, and Christmas tree cutting. Due to the large acreage of pinyon-juniper woodland available within the vicinity this loss is negligible in comparison to the regional supply. Overall, impacts to forest products from the 25 kV overhead distribution line would be long-term, localized, and minor.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative
Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action.

No Action Alternative
Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. The vegetation types within the authorized Notice-level area include curl-leaf mountain mahogany, pinyon- juniper woodlands, and sagebrush. Notice-level activities may occur within these vegetation types, so woodland species may be impacted by the No Action Alternative to a lesser degree than the Proposed Action. The existing conditions would include the approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under the No Action Alternative, reclamation of the approximately 420 acres of existing disturbance would not occur as proposed under the Proposed Action. This may have long-term impacts to forest products because the existing disturbance would continue to lack appropriate understory vegetation to assist with regrowth of woodland species. Impacts to forest products from this alternative are expected to be localized, long-term, and negligible.

Geology and Minerals

Proposed Action
The Proposed Action would have direct and indirect impacts to the geology and mineral resources within the Plan boundary. The Proposed Action would entail mining approximately 72.5 million tons of waste rock and 13 million tons of ore that would be processed onsite. The Proposed Action would ship offsite approximately 325,000 ounces of gold over the life of the Project. Waste rock dumps containing some 73 million tons of rock would cover 351 acres immediately adjacent to the mine pits, limiting access to any remaining underlying mineral resources by covering the underlying lithologies. The lined heap leach facility containing 13 million tons of ore would cover 106 acres and hinder access to any subsequently discovered underlying mineral resources. The disturbances constitute a fraction of a percent of the acreage containing the geologic and mineral resources. As such these areas of the Proposed Action involve a permanent minor to negligible portion of the regional geologic and mineral resource.

25 kV Overhead Distribution Line Alternative
The 25 kV Overhead Distribution Line Alternative would have the same impacts as the Proposed Action and additionally would impact the surface of colluvium and alluvium along the distribution line route. Approximately 45 acres of disturbance would be created in the basin-fill sediments, in addition to re-disturbance of approximately 85 acres along existing distribution facilities during construction. The indirect impact would be limitation of access to bedrock lithologies underlying the distribution facilities constructed for this alternative. The disturbance and occupancy of an additional 45 acres of Quaternary to Holocene sediments would be a short-term, negligible impact on the geology and mineral resources of the area.

Three Bars Road/Atlas Haul Road as Only Access Alternative
Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative
Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. The maintenance activities during use of these existing roads, hosted in Quaternary and Holocene sediments, would have short-term, negligible direct and indirect impact to the geology and mineral resources.

No Action Alternative
Under the No Action Alternative, no mining would occur, so there would be no additional exposure of lithologies in the existing mine pits. There would be no extraction of the gold reserves. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. No impacts to geology and minerals would occur from this alternative.

Grazing Management

Proposed Action
Direct impacts to rangeland resources from the implementation of the Proposed Action would include a potential reduction in active animal unit months (AUMs) due to a loss of forage availability and reduced access to some portions of the Project area due to fencing or high anthropogenic activity during operations. Direct impacts could also include the potential for livestock injury or mortality from vehicle collisions. The Proposed Action would be primarily located within two grazing allotments, which include Three Bars and Roberts Mountain allotments. Implementation of the Proposed Action could result in the permanent loss of 10 AUMs (due to unreclaimed mine features) and the temporary loss (i.e., until successful reclamation) of 69 AUMs, but any adjustment to permitted AUMs would be based on forage lost, removed, or otherwise inaccessible due to mining operation. Permitted active AUMs are 5,840 for the Three Bars Allotment and 9,624 for the Roberts Mountain Allotment, both divided between cattle and sheep. The Proposed Action would result in a less than 0.01 percent loss of AUMs in either allotment. This anticipated to be a temporary, regional, and minor impact.

Indirect impacts from the Proposed Action include economic impacts from the potential reduction in AUMs from the Proposed Action. In total, approximately $790.30 in economic impacts would be realized annually based on the permanent loss of 10 AUMs from the Proposed Action. Long-term loss of 69 AUMs (57 in the Roberts Mountain Allotment and 12 in the Three Bars Allotment) would equate to approximately $43,625 over the life of the mine and

majority of reclamation (estimated at six years after cessation of mining and residual heap leaching. This impact would not be long-term, regional, and minor to the ranching community and agricultural or grazing sector of Nevada's or Eureka County's economy, but the economic impact to the affected permittees could be long-term, regional, and moderate.

25 kV Overhead Distribution Line Alternative

Direct impacts to rangeland resources from the implementation of the 25 kV overhead distribution line alternative in addition to those realized for the Proposed Action could include a negligible, temporary reduction of eight active AUMs due to a loss of forage availability until vegetation is re-established after reclamation. Adverse, temporary, negligible effects would be greater during the construction phase of the power line. Revegetation of the ROW would occur under this alternative, so grazing productivity would return over time. Impacts are anticipated to be temporary (lasting until revegetation is established), regional, and negligible.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. The potential for livestock-vehicle collisions may be increased along Three Bars road, since the light-duty vehicle traffic would also be using this access road. Overall, impacts to grazing management from this alternative would be long-term, regional, and negligible, the same as those described for the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. Potential impacts from vehicle-livestock collisions may be reduced because the Mount Hope Plan boundary would be fenced, excluding livestock. Overall, impacts to rangeland resources from this alternative would be long-term, regional, and negligible, the same as those described for the Proposed Action.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities The existing conditions would include approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under the No Action Alternative, reclamation would not occur on portions of the existing disturbance. Impacts to grazing management from this alternative are expected to be localized, negligible, and short-term.

Hazardous or Solid Waste

Proposed Action

The Proposed Action would result in the use of hazardous materials and waste management practices for mine production, with the potential to affect the air, water, soil, and biological resources from an accidental release of hazardous materials and/or solid and hazardous waste during transportation to and from the Project area, or during storage and use on the Project site. It is anticipated that the Proposed Action would result in the classification of the facilities as a Small Quantity Generator of hazardous waste as defined by the EPA (between 220 pounds, or 100 kilograms, and 2,205 pounds, or 1,000 kilograms, per month). Management of hazardous waste, including storage, disposal, and reporting, would be in accordance with the Resource Conservation and Recovery Act requirements. Petroleum waste and hazardous materials that are not spent or consumed on site would be recycled or disposed off-site at an approved facility in accordance with applicable federal and state regulations. A spill contingency plan has been prepared by MMI that establishes procedures for responding to accidental spills and releases of petroleum products. Based upon the small quantities of hazardous waste that would be generated by the Proposed Action, an accident resulting in a release of hazardous waste to the environment during transportation off the Proposed Action area is not anticipated. Impacts from hazardous and solid waste from the Project are expected to be long-term, regional, and minor.

25 kV Overhead Distribution Line Alternative

The types of wastes managed and the applicable management practices applied for the 25 kV Overhead Distribution Line Alternative would be the same as for the Proposed Action. The environmental impacts of these practices for the 25 kV Overhead Distribution Line Alternative would, therefore, be the same as the Proposed Action.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action. The types of wastes managed and the applicable management practices applied for the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as for the Proposed Action. The environmental impacts of these practices for the Three Bars Road/Atlas Haul Road as Only Access Alternative would, therefore, be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action. The types of wastes managed and the applicable management practices applied for the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as for the Proposed Action. The

environmental impacts of these practices for the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would, therefore, be the same as the Proposed Action.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. Notice-level activities would result in the use of hazardous materials, and have the potential for an accidental release of hazardous materials during transportation to and from the Project area, or during storage and use on the Project site. Hazardous materials used on site would be spent or consumed during Notice-level operations. Materials that were not spent or consumed, such as used antifreeze and oil, would be recycled or disposed in accordance with applicable federal, state, and local regulations. Impacts from hazardous or solid waste are expected to be short-term, regional, and negligible under this alternative.

Historic Trails

Proposed Action

The Pony Express NHT does not cross the main mining Project area, but the two existing access roads which are part of the Plan boundary do cross the Pony Express NHT. Public and recreational access to the trail would not be affected by mining and processing facilities. However, there would be increased mine traffic. While mining and processing facilities would be located outside of the National Trail study corridor, many of the facilities and much of the surface disturbance would be visible from within the corridor, which would introduce form, line, color, and texture elements that contrast with existing landscape. These modifications would be short-term, localized, and negligible to minor on the visual setting of the NHT. Impacts to the setting of the Pony Express NHT from noise impacts would be short-term, localized, and moderate. Impacts relating to a change in the accessibility of the trail and the level of traffic on adjacent roads would be short-term, localized, and negligible. Widening and improving North Roberts Creek Road would result in changes to the scenic quality of National Trail Study Corridor, but impacts to the intended purposes or uses, or the setting of the Pony Express NHT would be long-term, localized, and negligible.

25 kV Overhead Distribution Line Alternative

The visual contrasts associated with mining and processing facilities would be the same for the 25 kV Overhead Distribution Line Alternative as described for the Proposed Action. The proposed distribution line would cross the Pony Express NHT and associated study corridor. The ROW for the distribution line would not restrict or alter existing public access to the trail. However, the overheard distribution line would have visual impacts on the setting of the trail. Impacts to the intended purposes, uses, and setting of the Pony Express NHT would be short-term, localized, and minor.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all

vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action. The authorized Mount Hope mine access road and well field road cross the Pony Express NHT. While all improvements to the Mount Hope access road would be within the previously permitted disturbance area for the Mount Hope Project, the number of vehicle trips on the roads would increase with the additional traffic to the Project. The additional traffic would increase ambient noise levels and could impact the user's experience by altering the feeling of a remote setting. Impacts to the intended purposes, uses, and setting of the Pony Express NHT would be localized, short-term, and minor.

No Action Alternative

Under the No Action Alternative, there would be no new impacts to the ambient noise levels within the National Trail study corridor from the continuation of these activities. Also, under this alternative, the Project would not be constructed, so the additional visual impacts associated with construction and operation of the Project would not occur. However, up to 16 acres of authorized surface disturbance would continue within the Project area under authorized Notice-level activities, which may currently be impacting the visual setting of the area of analysis. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Under the No Action Alternative, reclamation would not occur on the portions of existing disturbance. Impacts to the Pony Express NHT under this alternative would be short-term and minor, lasting for the duration of exploration activities within the area of analysis. The existing disturbance within the Project area would continue to be a long-term, localized, minor impact on the visual setting of the Pony Express NHT.

Land Use, Access, Realty, and Transportation

Proposed Action

Mining and processing facilities associated with the Proposed Action would result in the disturbance of approximately 1,129 acres, Project related disturbance would result in the short-term, minor, direct loss of approximately 946 acres (including exploration operations, but not including non-MMI disturbance to be reclaimed) of public land for multiple use authorizations for the seven-year life of the mine (i.e., five years of active mining and heap leaching plus two years of residual leaching). Approximately 154 acres (approximately 14 percent of the total mine related disturbance), including the pits, ponds, roads and stormwater diversion channels, would remain as post-reclamation features, which may result in permanent, localized, and negligible indirect impacts to land uses.

Mining and processing facilities would not result in conflicts, substantial modifications or termination of any authorized ROWs or land use authorizations, and public access would not be

prohibited on the access roads, and these access roads would remain open for public access during mining operations. Impacts to existing land use authorizations, and public access on the access roads from the Proposed Action are anticipated to be short-term, localized, and negligible.

The Project proposes to bus the majority of employees to the site from a park-and-ride location in the Town of Eureka. Traffic generation on the Roberts Creek Road route is anticipated to be 20 light vehicles per shift (i.e., 10 vehicles entering the site and 10 vehicles exiting the site per shift), for a total of 40 trips per day, which includes the vans used to transport employees and other light vehicle traffic associated with the Project. Large vehicle traffic generation is estimated at 10 round trips per day on Three Bars Road. Whereas this does result in an increase of daily traffic above baseline conditions, MMI would maintain these roads in coordination with Eureka County, so impacts from this traffic increase would be short-term, regional, and minor.

25 kV Overhead Distribution Line Alternative

Since mining and processing operations under the 25 kV Overhead Distribution Line Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. The 25 kV Overhead Distribution Line Alternative would result in an additional direct loss of 124 acres of public land for multiple use authorizations, and six acres of private land, for the life of the distribution line. Impacts to multiple use authorizations from the 25 kV Overhead Distribution Line Alternative would be short-term, regional, and negligible because the distribution line would be within an existing power line corridor, or would follow an existing road.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action. Traffic impacts on Roberts Creek Road described under the Proposed Action would not occur under this alternative. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Construction and maintenance of the water supply pipeline would generate temporary, localized, and negligible traffic impacts from this alternative.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action. This alternative would increase traffic generation on the Mount Hope access road and Mount Hope well field road by 40 trips per day, thus reducing traffic on Roberts Creek Road by the same amount, which would be a short-term, regional, minor impact.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under the No Action Alternative, no reclamation would occur on the approximately 420 acres of existing disturbance proposed under the Proposed Action. This would be a permanent, localized impact, as multiple use authorizations would not benefit from having these areas reclaimed. Impacts to land use, access, realty, or transportation from this alternative are expected to be short-term, localized, and negligible.

Native American Cultural Concerns

Proposed Action

To date, no traditional cultural property, property of traditional religious cultural importance, or sacred site has been identified by the tribe or bands participating in the government-to-government consultation process or through cultural resources inventories. If a place of traditional cultural importance is identified by tribal representatives and avoidance is not feasible, specific operating procedures, stipulations, or mitigation measures would be developed in consultation with the affected tribal groups with the goal of reducing or eliminating impacts to the identified resource. If mitigation is required at a site listed, or eligible for listing, on the NRHP, an HPTP would be developed and approved by the BLM and SHPO. Tribal representatives would be asked to participate in the development of any such treatment plan. Direct and indirect impacts to a place of traditional cultural importance, including burials/gravesites, as a result of the Project would be the same as described for cultural resources

25 kV Overhead Distribution Line Alternative

Direct and indirect impacts from the 25 kV Overhead Distribution Line Alternative would be the same as described for the Proposed Action.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. Any potential impacts to places of traditional cultural importance (including unanticipated discoveries) that may have occurred under the Proposed Action would not occur under this alternative. To date, no places of traditional cultural importance have been identified in the area of the Notice-level exploration activities. No impacts to places of traditional cultural importance are expected from this alternative.

Noise

Proposed Action

Impacts to noise levels from the Project would be related to construction and operation. Noise impacts during operation would occur from mining, blasting, and travel along roads. The Project is not predicted to generate hourly noise levels exceeding the EPA exterior noise criteria of 55 A-weighted decibels (dBA) average, or equivalent, sound level at either of the two ranches. The impacts from noise are expected to be minor, localized, and short-term, lasting for the duration of mining. Noise impacts from blasting are expected to be minor, localized, and short-term, lasting for the duration of Project.

25 kV Overhead Distribution Line Alternative

Impacts from noise to humans under the 25 kV Overhead Distribution Line Alternative would be the same as those described for the Proposed Action for mine construction, operation, and blasting. There would be some temporary noise generated during construction of the distribution line, but impacts are anticipated to be localized and negligible.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action. However, there would be no noise generated from Project-related travel along Roberts Creek Road under this alternative, but according to the analysis noise along this road was not a top contributor to noise detected at the Roberts Creek Ranch.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action There would be additional noise generated from travel along Mount Hope roads under this alternative. However, this additional travel would likely not be audible from the ranches.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities, which would generate noise associated with the exploration operations. Authorized Notice-level exploration operations would continue, which would result in negligible, localized, and short term noise impacts at the Three Bars Ranch and the Roberts Creek Ranch.

Paleontological Resources

Proposed Action

Mining conducted as part of the Proposed Action would blast, remove, and crush the host formations for vertebrate and invertebrate fossils. Any significant resources within the mine pits would be impacted by these activities. These impacts would be permanent, localized, and minor The Proposed Action would affect the resource indirectly because the exposures in the remnant mine benches would leave this resource accessible to vandalism and theft after mine closure; however, the remnant mine benches would also provide new exposures for academic study.

25 kV Overhead Distribution Line Alternative

Impacts from the 25KV Overhead Distribution Line Alternative would be similar to the direct and indirect impacts of the Proposed Action. The disturbances for the installation of the distribution line would be primarily in Quaternary and Holocene sediments which have low potential fossil yield classifications, with minor distribution line segments founded in Devils Gate Limestone and/or Vinini Formation which have low to moderate potential fossil yield classifications.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. The maintenance of the existing Mount Hope access road and well field road, hosted in formations with low potential fossil yield classification, for light vehicle traffic would prevent access to underlying paleontological resources for the life of the Project, which would be a short-term, regional (since the Mount Hope access road and well field road are outside of the Project boundary), negligible impact.

No Action Alternative

Under the No Action Alternative, there would be no additional exposure of lithologies in the existing mine pits. There would be no reclamation of certain existing mine pits; exposures of the

fossiliferous McColley Canyon Formation in the Gold Pick pit would remain open for scientific access. Under this alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities which is not expected to impact paleontological resources.

Recreation

Proposed Action

The Proposed Action mining and processing facilities would result in short-term, direct effects due to access restrictions within the Project boundary, including within the 127 acres of fenced area within the Plan boundary, for the duration of the Project. In areas of active mining (including around the open pits and WRDAs), recreation activities would be restricted and would likely result in recreationists using other areas surrounding the Project. The Proposed Action would reduce the area available for dispersed recreation by approximately 946 acres. The Proposed Action is anticipated to have short-term, localized, minor impacts associated with reduction in available recreation area because there is adequate public land surrounding the Project for dispersed recreation. Approximately 154 acres (approximately 14 percent of the total mine related disturbance), including the pits, ponds, roads and stormwater diversion channels, would remain as post reclamation features. Impacts to recreation activities resulting from the pits, ponds, roads, and diversion channels that would not be reclaimed is anticipated to be permanent, localized, and minor because the existing conditions already includes similar features (e.g., pits and roads).

The Proposed Action mining and processing facilities would have a short-term, minor, indirect effect on surrounding areas due to the displacement of recreationists to surrounding areas resulting from Project activities, which would be a short-term, regional, minor impact.

25 kV Overhead Distribution Line Alternative

Since mining and processing operations under the 25 kV Overhead Distribution Line Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. The 25 kV Overhead Distribution Line Alternative would result in additional impacts to 124 acres of public land that may be used for dispersed recreation for the life of the power line, and approximately six acres of private land. Impacts to recreation resources from this alternative would be temporary, regional, and negligible because the alternative would follow existing roads or power line corridors, and recreation within the ROW area would return after construction of the power line is completed

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative
Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action.

No Action Alternative
Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on the approximately 420 acres of existing disturbance proposed under the Proposed Action, which would remain as an existing long-term, minor impact to recreation uses and the recreation setting. The types and levels of dispersed recreation would remain the same as existing conditions This alternative would have a long-term (due to the unreclaimed disturbances), localized, minor impact on recreation activities.

Social and Economic Values

Proposed Action
Considering the relatively short construction schedule of the Project, and that many of the workers would be contractors, moving in and out of the area as their particular skills were needed, it is assumed that many of the needed construction workers may come from outside of Town of Eureka, whereas the short duration of construction suggests that most of the secondary job opportunities generated by Project construction would be filled by individuals already residing in the vicinity of the Project. Unlike construction, it is expected that most of the Project workers would come from within the local area of analysis, and a high percentage of secondary job opportunities would be filled by individuals already residing in the area. Assuming many construction workers would be non-local, the permanent housing market would not be impacted to any substantial degree during construction. They would, however, place a substantial demand on local temporary housing resources in Eureka and surrounding communities. The approximately seven-year operating life of the Project (including construction pre-stripping and the additional two years for residual leaching) would likely result in a majority of the operations' workers seeking residence in the Project vicinity with most of them locating in or near Eureka primarily because of proximity to the Project site. It is anticipated that there would be sufficient housing available to accommodate the Project-related demand. In summary, construction of the mine would have a short-term, localized, moderate, positive short-term fiscal effect on the entities within the area of analysis, and operation and maintenance of the mine would have a long-term, minor positive fiscal effect for the life of the Project. These effects would effectively cease at the time the Project is completed and reclaimed.

25 kV Overhead Distribution Line Alternative
Construction of the 25 kV Overhead Distribution Line Alternative would require employment of approximately six to 10 contract workers for a period of up to six months. Construction of the

distribution line would generate additional wages and salaries, including benefits; however, any such work would be done by existing staff of Mt. Wheeler and would not be expected to affect employment or income in the vicinity of the Project. Initial capital expenditures and operating costs would be reduced, in part due to the reduction in fuel needed for the use of generators. During the operational life of the 25 kV distribution line, in summary, construction of this alternative would have a localized, temporary, minor, positive fiscal effect on the entities within the area of analysis.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action.

No Action Alternative

Under the No Action Alternative, the Project would not be developed and associated effects on social and economic values in the area would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. Under this alternative, the number of employees would continue at existing low levels and impacts to social and economic values is expected to be short-term, localized, and negligible.

Soils

Proposed Action

Soil disturbance is proposed for 1,129 acres within the Plan boundary (including exploration activities), of which 395 acres have been previously disturbed. New disturbance to undisturbed soils would include approximately 718 acres of long-term disturbance with implementation of the Project. Approximately 154 acres would not be reclaimed after the Project ceases operation, which include the pits, process ponds, some roads, and storm water diversion channels. Impacts to soils would primarily be long-term and localized, since reclamation would occur; however, the areas not reclaimed would result in permanent, localized soil disturbance. The Proposed Action would result in structural, physical, and chemical alterations that could result in the potential for decreased soil function leading to poor quality of the topsoil, the potential for increase in wind or water erosion, and the potential contamination of soils from spills or leaks of chemicals associated with mining operations. Overall, impacts to soils are expected to be long-term, localized, and minor to moderate over the life of the mine and after life of mine.

25 kV Overhead Distribution Line Alternative

Since mining and processing operations under the 25 kV Overhead Distribution Line Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. Temporary impacts to soils would occur within the 80-foot working ROW during construction, while the longer-term impacts would occur within the 40-foot ROW where the existing poles and maintenance road would remain. Soils would be disturbed during overland movement, construction of the center line travel road, or where soils would be bladed or removed during construction. All disturbed soils would have an increased potential for wind or water based erosion, and would result in degradation of soil function (e.g., water holding capacity, plant support). Approximately 130 acres of soils would have direct, short-term, regional, and moderate impacts, but after reclamation of the working ROW these impacts are expected to be short-term and minor as the ROW soils establish vegetated cover.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action. Since this alternative would utilize existing roads for mine access, this alternative would not result in any new additional disturbance to soil resources from what is detailed for the Proposed Action because the soils in the roadways have already been disturbed. The continual use of Three Bars Road and Atlas Haul Road would increase the risk of soil erosion; however, this impact would be considered short-term, localized, and negligible.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action. The continual use of the Mount Hope roads would increase the risk of soil erosion, however, this impact would be considered short-term, localized, and negligible.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. Notice-level activities may include direct soil removal, compaction, and soil redistribution associated with drill pad and drill road construction. Use of existing roadways would result in increased potential for soil erosion from wind and water due to the lack of vegetation or protective cover, and additional soil compaction. Impacts to soils from this alternative are expected to be minor, long-term, and localized.

Vegetation

Proposed Action

Vegetation communities within the Project area include curl-leaf mountain mahogany, limber pine, pinyon/juniper woodland, and sagebrush steppe. There is approximately 660 acres of existing disturbance within the Project area where vegetation has already been disturbed. Direct impacts of the Proposed Action would include removal of approximately 1,129 acres of vegetation (including exploration activities), 395 acres of which have been previously disturbed. Approximately 167 acres of curl-leaf mountain mahogany, 482 acres of pinyon/juniper woodland, and 20 acres of sagebrush steppe would be disturbed from Project activities. Unreclaimed features include pits, ponds, some roads, and stormwater diversion channels, totaling 154 acres (14 percent of total disturbance within the Plan boundary). Impacts to vegetation resources from noxious weeds and non-native invasive species would include the establishment and spread of these species during construction or reclamation. Project EPMs would substantially reduce the spread and establishment of noxious weeds and non-native invasive species from the Proposed Action. Overall impacts to vegetation communities would be long-term and minor. Overall impacts to vegetation communities from the Proposed Action would be long-term, localized, and minor.

Three special status plant species have the potential to occur in the Project area; however, none were identified during baseline surveys conducted in 2012. Direct and indirect impacts to special status plant species would include the disturbance of 669 acres of vegetation communities that may provide potential habitat for least phacelia, Beatley buckwheat, and Monte Neva paintbrush. Impacts to special status plant species from the Proposed Action are expected to be long-term, localized, and negligible. The Proposed Action would be in conformance with the ESA and other Federal regulations regarding special status plant species.

25 kV Overhead Distribution Line Alternative

Direct impacts from the 25 kV Overhead Distribution Line Alternative in addition to those realized under the Proposed Action would include removal of approximately 130 acres of vegetation. The Sagebrush Steppe and Inter-Mountain Basins Big Sagebrush Shrubland would be the communities most disturbed from this alternative (i.e., 86 percent of total disturbance). Indirect impacts to vegetation communities would include the added potential for spread and introduction of noxious weeds and non-native invasive species; the loss of forage for wildlife, wild horses, and livestock; and potential for increased soil erosion. Overall, direct and indirect impacts to vegetation communities for this alternative would be long-term, regional, and minor.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action. One indirect impact from this alternative would be the reduced potential for the spread of noxious weeds and non-native species along the Roberts Creek Road because this road would not be utilized for light-duty vehicles accessing the mine.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action. No additional direct impacts to vegetation resources would be anticipated from this alternative. Indirect impacts would be long-term, regional, and negligible and include the potential for noxious weeds and non-native species spread along Mount Hope roads from the travel of light-duty vehicles accessing the mine.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. The vegetation types within the authorized Notice-level area include curl-leaf mountain mahogany, pinyon-juniper woodland, and sagebrush. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on the approximately 420 acres of existing disturbance proposed for reclamation under the Proposed Action. This may have a long-term impact on vegetation, since without reclamation of these disturbed areas, and without the implementation of the Noxious Weed Management Plan under this alternative, noxious weeds and non-native invasive species may spread throughout the Project area. Impacts to vegetation from this alternative are expected to be minor, localized, and long-term.

Visual Resources

Proposed Action

The removal of vegetation cover and mass movement of soils and landforms associated with the Project would introduce form, line, color, and texture elements that contrast with the features of the existing landscape. In addition, the facilities and structures associated with Project, such as mine administrative office, the truck shop, and fencing, would also introduce form, line, color, and texture elements that contrast with the features of the existing landscape. The contrasting visual resource elements introduced by the Project are anticipated to be long-term, lasting through the life of the Project. Reclamation would reduce the visibility of the Project and lessen the degree of contrast it would have with existing landscape features; however, the features not reclaimed, including the pits, would continue to result in visual contrast with the existing landscape after mining operations cease. Mining and processing facilities would be located on BLM-administered public lands that have been designated as Visual Resource Management (VRM) Class IV. The Project would not conflict with the VRM Class IV designation objectives. However, the northern portion of the Project would be within an area designated as a VRM Class II. These disturbances would not be consistent with the VRM Class II. Use of Project lights would contribute to the illumination of night sky in an area that is largely uninhabited and unlit. The Project would have short-term, regional, and negligible impacts on night sky lighting because there are very few existing light sources in the area and the ambient light level is very low, and because the Project would introduce relatively few light sources to the area.

25 kV Overhead Distribution Line Alternative

Under the 25 kV Overhead Distribution Line Alternative, the visual impacts from mining and processing facilities would be the same as described for the Proposed Action. The distribution line would repeat some visual elements in the landscape, but not dominant or common elements. Thus, it is anticipated that the distribution line would have a moderate degree of visual contrast. However, the level of change and impact from the Key Observation Points would be consistent with the objectives of BLM VRM Class IV.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities, which adds linear and irregular shaped forms to the landscape from exploration roads and drill pads. However, the color of the roads and drill pads would be very similar to and repeat the color of existing mine disturbance and road disturbance within the Project boundary. Visual contrast would be anticipated to be localized, minor, and negligible and consistent with the BLM VRM Class IV objectives.

Water Quality and Quantity

Proposed Action

Surface Water Impacts

Impacts to surface water resources within or adjacent to the Project are not expected because there are no perennial streams or springs within the Plan boundary, drawdown associated with the Project would be limited to the alluvial aquifer in Kobeh Valley, and appropriate EPMs and Best Management Practices for erosion and sediment control would be implemented to protect surface water resources from pollution related to mining and processing operations.

Groundwater Impacts

The Proposed Action includes proposed water supply of alluvial groundwater from the area near the Roberts Creek Ranch from two wells that would be used to pump an estimated average of 380 gallons per minute alluvial groundwater for the seven-year estimated life of mine, and a maximum of 500 gallons per minute during the seven-year mining period. Under the most conservative pumping scenario the 10-foot drawdown isopleth would extend up to two miles

from the two production wells, and drawdown at the Roberts Creek Ranch well would be around 25 feet. Only the Roberts Creek Ranch well would be impacted by the pumping of production water from the alluvial aquifer near the Roberts Creek Ranch. Ninety-nine percent recovery of ground water levels are expected within two years after cessation of pumping. No springs or seeps would be impacted by pumping of the production wells. Impacts to groundwater are anticipated to be long-term, regional, and minor.

Geochemistry Impacts

No pit dewatering is planned by MMI during mining operations. Consequently, no post-mining pit lakes are expected in any of the four proposed mine pits. Therefore, impacts associated with the four mine pits that would remain on site after the cessation of mining are anticipated to be long-term, regional, and negligible. Waste rock characterization test results showed that approximately 90 percent of the waste rock expected to be generated would be non-acid generating (Non-Designated waste) and have excess neutralization capacity because of the carbonate-rich sedimentary rock that would compose the great majority of waste rock. Approximately 10 percent of the waste rock to be generated by the Project would consist of unoxidized sulfide-bearing carbonaceous and decalcified limestone, which is potentially acid generating (Designated waste rock). The Non-Designated waste rock would be placed in one of the nine WRDAs developed for this type of waste. The Designated waste would be placed in the Designated Waste Cell located at the Pick East Lower WRDA. This facility would be a constructed basin buttressed by Non-Designated waste and surrounded by a downgradient berm constructed of Non-Designated waste, and covered with an amended soil using bentonite to minimize meteoric infiltration. Impacts are anticipated to be long-term, localized, and negligible. The HLP would have an engineered liner and leak detection system, and would be a zero discharge facility. Environmental impacts from the HLP during operation are anticipated to be long-term, regional, and negligible. because it would be designed as a zero discharge facility in accordance with Nevada Administrative Code guidelines. The two monitoring wells that surround the facility would be monitored to ensure no impacts to groundwater beyond the Plan boundaries.

25 kV Overhead Distribution Line Alternative

Potential impacts to surface water, groundwater, and geochemistry from the 25 kV Overhead Distribution Line Alternative would be similar to the Proposed Action.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts to surface water, groundwater, and geochemistry would be the same as the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the

exception that all light vehicle traffic would use the Mount Hope access road and well field road, surface water, groundwater, and geochemistry impacts would be the same as the Proposed Action.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under the No Action Alternative, no reclamation would occur on the approximately 420 acres of existing disturbance proposed for reclamation under the Proposed Action. Erosion and sedimentation may continue to occur on areas that are not reclaimed which may have an impact to surface water quality. Impacts to water quality from this alternative are expected to be long-term, regional, and negligible

Wetland and Riparian Zones

Proposed Action

There are no wetlands or riparian habitat within the Plan boundary; therefore, there would be no impacts to these resources as a result of the Proposed Action.

Groundwater modeling of the two production wells generally indicates that impacts to the alluvial aquifer from pumping at the proposed production wells do not appear to be significant in terms of appreciably lowering of water levels in the area. There are no wetlands located within the 10-foot drawdown contour for either scenario of groundwater pumping. The contours do overlap areas within Roberts Creek that are mapped as dry meadow and willow, which both support some riparian vegetation. Since these areas are upgradient of the production wells and are supported by headwaters located outside of areas impacted by the predicted pumping drawdown from the Proposed Action, impacts are anticipated to be regional, negligible, and long-term.

25 kV Overhead Distribution Line Alternative

There are no wetland or riparian resources identified within the 25 kV Overhead Distribution Line Alternative; therefore, impacts to wetland and riparian resources would be the same as for the Proposed Action. Impacts to wetland and riparian resources would be regional, negligible, and long term.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, with the exception that all vehicular traffic (heavy and light) would use Three Bars Road and the Atlas Haul Road, impacts would be the same as the Proposed Action, and would be negligible and long term.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative
Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, with the exception that all light vehicle traffic would use the Mount Hope access road and well field road, impacts would be the same as the Proposed Action. There are no identified wetland or riparian areas along Mount Hope road alignments.

No Action Alternative
Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities. There are no wetlands or riparian areas within the Notice-Level activities, so there would be no direct or indirect impacts to wetland and riparian resources from this alternative, so impacts are assumed to be regional, long-term, and negligible.

Wildlife

Proposed Action
Direct impacts to wildlife populations could include limited direct mortalities from construction vehicle-related mortalities, habitat loss or alteration, incremental habitat fragmentation, and animal displacement. Indirect impacts could result from increased noise and additional human presence. Construction of the Proposed Action would disturb three types of wildlife habitat; curl-leaf mountain mahogany, pinyon-juniper woodland, and sagebrush steppe. The Proposed Action would disturb a total of approximately 1,129 acres (including exploration activities), including approximately 718 acres of disturbance in habitat that has not been previously disturbed, and 395 acres within areas of existing disturbance. Approximately 167 acres of curl-leaf mountain mahogany, 482 acres of pinyon/juniper woodland, and 20 acres of sagebrush steppe would be disturbed from Project activities. Unreclaimed features include pits, ponds, some roads, and stormwater diversion channels, totaling 154 acres (14 percent) of total disturbance within the Plan boundary. The disturbance areas would be converted to a grass and forb dominated community, and eventually a shrub-dominated community after reclamation, and the seed mix would provide for species similar to pre-disturbance communities, except for existing tree species like pinyon, juniper, and curl-leaf mountain mahogany.

General Wildlife
Impacts to small mammals would include direct mortality during clearing and grubbing operations and a loss of available habitat. Other larger, more mobile wildlife throughout the Plan boundary would disperse once construction begins. These impacts are expected to be long-term, localized, and minor to most species and the impacts would not result in population level impacts.

Migratory Birds
Project activities would disturb habitat that supports migratory birds, including species that utilizing the woodland communities (i.e., pinyon-juniper and curl-leaf mountain mahogany) within the Project area. Until reclamation occurs, this habitat would be lost as potential migratory bird

nesting and foraging habitat. Most of the mine features would be reclaimed, and once restored, would present suitable habitat for many migratory bird species. However, reclaimed areas would not provide habitat for woodland species because these communities can take 50 to 100 years or more to reestablish. Impacts to migratory birds from habitat removal and, fragmentation are anticipated to be long-term, localized and minor. Impacts resulting from displacement are anticipated to be long-term, regional, and minor.

Raptors

Potential impacts to raptors include direct mortality, habitat or nesting substrate removal, and indirect (e.g., noise) disturbance resulting in displacement. Direct mortality and indirect disturbance to raptors would be prevented or limited by the EPMs. Impacts are anticipated to be long-term, localized, and negligible to minor.

Mule Deer

Implementation of the Proposed Action would result in the disturbance of mule deer habitat. Impacts are anticipated to be long-term, localized, and minor. Noise and human activity would be expected to cause deer to avoid areas adjacent to active disturbance, and the location of the proposed disturbance within the Plan boundary is in proximity to a known migratory corridor for mule deer where deer move between summer range in the higher elevation woodlands to the lower piedmont slopes in the winter. Impacts are anticipated to be long-term, regional, and minor.

Pronghorn Antelope

The Proposed Action would disturb approximately 18 acres of year-round habitat for pronghorn antelope. Direct effects to Pronghorn antelope from the Proposed Action could occur as a result of vehicle collisions or loss of habitat. These effects would be localized, long-term, and minor to moderate for individuals, but negligible for the population as a whole due to the small amount of disturbance relative to habitat available.

Greater Sage-Grouse

The Proposed Action is not expected to result in direct mortality to greater sage-grouse, as any individuals within the Plan boundary are expected to disperse upon commencement of any ground-disturbing activities. However, the Proposed Action would result in the direct loss of greater sage-grouse habitat. The Proposed Project would disturb approximately 11 acres of undisturbed late summer habitat, approximately five acres of undisturbed winter habitat, and approximately six acres of undisturbed nesting and early brood rearing habitat. According to the Sagebrush Ecosystem Program (SEP) December 2015 mapping, the Proposed Action would disturb approximately 297 acres of PHMA and 767 acres of General Habitat Management Areas (GHMA), of which approximately 395 acres (37 percent) has been previously disturbed. Both direct impacts from disturbance as well as indirect impacts, primarily associated with noise, would either be offset using the state of Nevada's Conservation Credit System (CCS) as described for the Proposed Action, or a proponent driven mitigation plan would be developed in coordination with the BLM, the Nevada Department of wildlife (NDOW) and the U.S. Fish and

Wildlife Service (USFWS). Because noise modelling indicates that increases exceeding the 10 dBA threshold are unlikely, and because EPMs would be in place restricting access road use during the lekking period, long-term, indirect effects of increased anthropogenic activity and noise on greater sage-grouse are expected to be long-term, regional, may affect, but not likely to adversely affect greater sage-grouse.

Other Special Status Species

The Proposed Action impacts to BLM sensitive birds would be similar to the impacts described for migratory birds. Direct mortality and indirect long-term effects due to noise/increased human presence are expected to be regional and may affect, but not likely to adversely affect, due in part to the EPMs. Because sage-thrasher, Brewer's sparrow, pinyon jay, loggerhead shrike, Northern goshawk, and Swainson's hawk are expected to occur only occasionally, and because sagebrush and pinyon-juniper habitat is abundant within the region, the impacts to these species associated with habitat removal would be long-term, localized, may affect, but not likely to adversely affect special status species. Impacts from habitat removal are anticipated to be long-term, localized, may affect, but not likely to adversely affect special status species.

An aerial survey conducted by Great Basin Ecology, Inc. in 2012 observed six active golden eagle nests and one inactive golden eagle nest. None of the active or inactive golden eagle nests were within the Plan boundary. Golden eagles are known to abandon nests early in the nesting chronology due to anthropogenic disturbance. Project EPMs require preconstruction clearance surveys during raptor breeding season to determine nest occupancy, and if a nest is found to be active, an appropriate construction buffer would be enacted until the bird's nest is no longer considered active and/or the young have fledged. As a result, impacts to nesting golden eagles are not anticipated. Long-term direct impacts of habitat loss would be localized, and may affect, but not likely to adversely affect golden eagles because of the amount of foraging habitat available in the area.

No ferruginous hawk nests have been identified within the Plan boundary during baseline surveys, although ferruginous hawks are known to nest in the general area. Three nests were located in the pinyon-juniper–sagebrush steppe interface near the Plan boundary during the 2012 baseline surveys. Because no ferruginous hawk nests have been identified within the Plan boundary, and because of the EPMs in place, neither direct mortality nor indirect noise related effects are expected. Loss of habitat associated with the Project is anticipated to result in long-term, localized, and may affect, but not likely to adversely affect.

Western burrowing owl suitable habitat is available adjacent to the Atlas Haul Road and one adult bird was observed near the Atlas Mill Site in late August 2012 during baseline surveys. During construction, burrowing owl burrows could be crushed and/or covered by construction. MMI would make reasonable effort to conduct vegetation-clearing activities outside of the breeding season for western burrowing owls, or preconstruction clearance surveys would be conducted prior to vegetation clearing activities. Long-term direct habitat loss would also occur,

but is also expected to be localized, long-term, and may affect, but not likely to adversely affect western burrowing owl due to the habitat available in the area.

Pygmy rabbit habitat was identified near the Atlas Haul Road. Because there would be no disturbance along the Atlas Haul Road, with the exception of maintenance activities, impacts in that area would be limited to direct mortality due to vehicle collisions. Given the relatively small size of the area to be impacted, it is anticipated that few burrows would be impacted and the impacts would be localized, long-term, and may affect, but not likely to adversely affect pygmy rabbit.

Shafts or adits are not known to occur within the Plan boundary. The principal impacts to BLM-sensitive bat species would occur due to a loss of forested habitats, which represent potential roosting areas for such species as long-eared myotis, silver-haired bats, and as bat foraging habitat The effects of habitat removal would be long term, but are expected to be localized and may affect, but not likely to adversely affect sensitive bats as roosting habitat (i.e., pinyon-juniper and cliffs/outcrops) are common throughout the region.

25 kV Overhead Distribution Line Alternative

The 25 kV Overhead Distribution Line Alternative contains most of the primary elements of the Proposed Action. As a result, most of the direct and indirect impacts would be similar to the Proposed Action, but with the potential for additional impacts due to the disturbance associated with construction and operation of the distribution line. Construction of the 25 kV distribution line would disturb two types of wildlife habitat, pinyon-juniper woodland (approximately eight acres) and sagebrush steppe/other mixed sagebrush shrubland (approximately 122 acres).

General Wildlife

Impacts to general wildlife within the Plan boundary would be the same as described for the Proposed Action. Within the distribution line ROW, impacts to small mammals include direct mortality during clearing and grubbing operations, direct mortality due to increased predation from perching raptors, indirect impacts due to construction noise, and loss of available habitat in areas temporarily and permanently cleared for disturbance. Impacts are anticipated to be minor, regional, and long-term.

Migratory Birds

Within the distribution line ROW, the types of impacts to migratory birds would be the same as described for the Proposed Action, with the exception of the potential for collisions and increased predation. Direct mortality and indirect short-term impacts would be negligible due to the EPMs. The primary impact would be the disturbance of an additional 130 acres of habitat for migratory birds. Until reclamation occurs, this habitat would be lost as potential migratory bird nesting and foraging habitat. the impacts would be long-term, regional, minor, and would not result in population level impacts.

Raptors

Raptor species that would forage and nest within the Project area, would also use the ROW corridor for forage. Within the Plan boundary, the types of impacts to raptors would be the same as described for the Proposed Action and for migratory birds. However, additional impacts from the distribution line may occur, which includes the risk of collisions and electrocutions, noise disturbance, and additional forage area disturbance. When combined with other impacts of the Proposed Action, the impacts would be long-term, regional, minor, and would not result in population level impacts.

Mule Deer

Approximately 130 acres of mule deer habitat would be lost until reclamation has taken place. Long-term direct effects of 130 acres of habitat loss would have a minor effect on mule deer due to the presence of suitable habitat adjacent to the ROW. Noise and construction activity related indirect effects would be short-term, and are not expected to have more than a negligible effect on mule deer. Effects within the Plan boundary would be the same as described for the Proposed Action and the combined impact would be long-term, regional, minor, and would not result in population level impacts.

Pronghorn Antelope

Approximately 89 acres of mapped habitat for pronghorn antelope would be lost until reclamation has taken place. Effects to pronghorn antelope are anticipated to be the same as described above for mule deer; long-term, regional, minor effects due to habitat loss and negligible effects due to noise and human activity.

Greater Sage-Grouse

Impacts to greater sage-grouse within the Plan boundary would generally be as described for the Proposed Action, with the exception of the possibility of increased predation. the Proposed Action, with the exception of increased predation. Construction of the distribution line would have similar types of effects, but there would be a greater overall loss of habitat. This alternative would potentially disturb an additional approximately 126 acres of late summer habitat, 106 acres of winter habitat, and approximately 75 acres of nesting and early brood rearing habitat. According to the SEP December 2015 mapping, construction of the distribution line would disturb approximately 80 acres of PHMA, 33 acres of GHMA, and 13 acres of Other Habitat Management Areas. However, approximately 24 acres of Priority Habitat Management Areas (PHMA) has been previously disturbed from the existing Atlas 25 kV distribution line. This disturbance is in addition the disturbance from the Proposed Action. Both direct impacts from disturbance as well as indirect impacts, primarily associated with noise, would either be offset using the state of Nevada's CCS as described for the Proposed Action, or a proponent driven mitigation plan would be developed in coordination with the BLM, the NDOW and the USFWS. As such, the long-term impacts to greater sage-grouse, even with the additional disturbance, may affect, but not likely to adversely affect greater sage-grouse.

Other Special Status Species

Impacts along the distribution line ROW to BLM sensitive birds would be similar to the impacts described for migratory birds. Because sage-thrasher, Brewer's sparrow, pinyon jay, loggerhead shrike, Northern goshawk, Swainson's hawk, and other raptors are expected to occur only on a migratory basis, and because sagebrush and pinyon-juniper habitat is abundant within the region, the impacts to these species associated with habitat removal would be long-term and may affect, but not likely to adversely affect these species.

Pygmy rabbit habitat was identified along the distribution line ROW where it parallels Roberts Creek Road. Installation of the distribution line has potential to provide additional perch sites for raptors in the area, which could result in increased predation of small mammals such as pygmy rabbits. Disturbance within this area could result in direct mortality and the destruction of burrows. Given the small size of the area likely to be impacted, it is anticipated that few burrows would be impacted and any habitat removal may affect, but would not likely to adversely affect pygmy rabbit.

Impacts to bats within the Plan boundary would be the same as described for the Proposed Action. Within the distribution line ROW, an additional nine acres of forested habitat, which provides bat roosting sites, would be lost. Bats may forage within the ROW, but because hibernacula habitat would not be disturbed, direct and indirect impacts to bats may affect, but would not likely adversely affect sensitive bat species.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road reducing anthropogenic activity in northern Kobeh Valley, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road, thereby increasing activity in northwestern Kobeh Valley. Impacts associated with increased anthropogenic activity in the form of light and large vehicle traffic along the Three Bars Road/Atlas Haul Road for this alternative are expected to be slightly greater as those discussed under the Proposed Action. This is particularly true for leks in closer proximity to and especially within line-of-sight of the Three Bars Road/Atlas Haul Road. However, no potential traffic impacts would occur as a result of this alternative to those leks adjacent the Roberts Creek Road as there would be no vehicles using it.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action, including the use of Three Bars Road for heavy vehicle traffic. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek

Road would not be used for access. The direct and indirect effects of this alternative would be similar to those described for the Proposed Action, except under this alternative there would be impacts from traffic on the Mount Hope access road and well field road. The amount of traffic going to/from the mine would be the same under this alternative as for the Proposed Action, only the location of traffic related impacts (including direct impacts from vehicle related mortality and indirect effects from noise) would change. Under this alternative, indirect effects to the leks along the Three Bars/Atlas Haul Road would be the same as the Proposed Action and impacts along the Roberts Creek Road would not occur. However, there would be impacts to the Henderson Pass lek (located 0.12 miles from the Mount Hope well field road) in addition to the other leks identified within four miles of the alternative (excluding Roberts Creek Road). Impacts to greater sage-grouse from this alternative are expected to be long-term, may affect, and would likely adversely affect this lek. However, implementation of seasonal road timing restrictions along the access roads from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15, impacts are expected to reduce impacts from this alternative.

No Action Alternative

Under the No Action Alternative, most of the impacts discussed for the Proposed Action would not occur. However, exploration activities associated with the No Action Alternative would impact various types of wildlife habitat throughout the area of analysis. Impacts may include habitat avoidance, wildlife displacement to adjacent areas from noise and increased human presence, and vegetation removal. The Notice-level activities may occur within both PHMA and GHMA habitat for greater sage-grouse. Impacts from this alternative are anticipated to be long term and minor, for wildlife, due to the availability of other suitable habitat in adjacent areas, and may affect, but would not adversely affect sensitive species.

Wild Horses and Burros

Proposed Action

Direct impacts of the Proposed Action to wild horses include loss of habitat, a reduction in forage availability, and possible mortality or injury from vehicle collisions. The Proposed Action would have a long-term impact from removal of 718 acres of existing vegetation communities within the Plan boundary. Removal of vegetation from construction of the mine facilities reduces the habitat and forage available for wild horses. Additionally, 127 acres would be fenced, excluding use by wild horses, but also protecting them from potential harm in these areas. The effects would be moderate and localized within the immediate Project area, but minor on the regional Herd Management Area (HMA) scale. The habitat is not highly valuable to wild horses due to pinyon and juniper cover, terrain and the existing disturbance from previous mining, and though wild horses move through the area, there is likely little reliance on the area for forage. Changes to wild horse distribution and use patterns are expected and could be moderate and long term within the Project area (localized) and minor or negligible in the rest of the HMA (regional).

25 kV Overhead Distribution Line Alternative

Direct impacts from the implementation of the 25 kV Overhead Distribution Line Alternative would include a potential reduction of forage available for wild horses and disturbance by increased human presence during construction. Additional impacts beyond those analyzed for the Proposed Action would be localized, short term and minor. Slight reductions in noise would occur as fewer generators would be in use at the processing facility due to the availability of electricity delivered to the site by the proposed distribution line.

Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under the Three Bars Road/Atlas Haul Road as Only Access Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. The potential for vehicle-wild horse collisions may be increased along Atlas Haul Road between the Three Bars Road and the Project boundary. Overall, impacts to wild horses from this alternative would be long-term, localized, and minor, the same as those described for the Proposed Action.

Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. Potential impacts from vehicle-wild horse collisions may be reduced because the Mount Hope Project boundary would be fenced, excluding wild horses. However, this access road is not as straight as Roberts Creek or Three Bars Road, increasing opportunity for collisions due to reduced visual distance on corners. Overall, impacts to wild horses from this alternative would be long-term, localized, and minor, the same as those described for the Proposed Action.

No Action Alternative

Under the No Action Alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities (exploration). The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on the approximately 420 acres of existing disturbance proposed under the Proposed Action, which may have a long-term impact on wild horses that may benefit from reclaiming these areas and potentially increasing forage area. No impacts to wild horses are expected from this alternative.

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LIST OF ACRONYMS & ABBREVIATIONS

°F	Degrees Fahrenheit
µg/m^3	Micrograms Per Cubic Meter
AADT	Annual Average Daily Traffic
AAQS	Ambient Air Quality Standards
ABA	Acid Base Accounting
ACHP	Advisory Council on Historic Preservation
ADR	Adsorption, Desorption, and Recovery
AERMOD	American Meteorological Society/USEPA Regulatory Model
AFY	Acre-Feet Per Year
AIRFA	American Indian Religious Freedom Act
AML	Appropriate Management Levels
amsl	Above Mean Sea Level

ANFO	Ammonium Nitrate and Fuel Oil
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
ARDML	Acid Rock Drainage and Metal Leaching
ARM	Appropriate Management Levels
ARMPA	Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment
ARPA	Archaeological Resource Protection Act of 1979
ASTM	American Society for Testing and Materials
ATV	All-Terrain Vehicle
AUM	Animal Unit Months
BAPC	Bureau of Air Pollution Control
bgs	Below Ground Surface
BLM	Bureau of Land Management
BMP	Best Management Practices
BMRR	Bureau of Mining Regulation and Reclamation
BP	Before Present
BWM	Bureau of Waste Management
CAA	Clean Air Act
CaO	Calcium oxide
CCD	Census County Division
CCS	Conservation Credit System
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CH_4	Methane
Chambers	Chambers Group
cm/sec	Centimeter Per Second
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CWA	Clean Water Act
dB	Decibel (unit of measurement)
dBA	A-weighted Decibels
DEIS	Draft Environmental Impact Statement
E	Evaporation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPM	Environmental Protection Measures

ESA	Endangered Species Act of 1973
ET	Evapo-transpiration
FCC	Federal Communications Commission
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land and Policy Management Act of 1976
FMUD	Final Multiple Use Decisions
FOS	Factor of Safety
FPPC	Final Plan for Permanent Closure
ft^3	Cubic Feet
FY	Fiscal Year
GAI	Geochemical Abundance Index
gals/day	Gallons Per Day
gals/yr	Gallons Per Year
GBC	Great Basin College
GBE	Great Basin Ecology, Inc.
GHG	Greenhouse gas
GHMA	General Habitat Management Areas
GIS	Geographic Information Systems
gpm	Gallons Per Minute
H:V	Horizontal:Vertical
H_2SO_4	Sulfuric Acid
HA	Herd Area
HCl	Hydrochloric Acid
HCT	Humidity Cell Tests
HDPE	High Density Polyethylene
HF	Hydrofluoric Acid
Hg	Mercury
HLP	Heap Leach Pad
HMA	Herd Management Area
HNO_3	Nitric Acid
HPTP	Historic Properties Treatment Plan
HQT	Habitat Quantification Tool
HSA	Hydrologic Study Area
HUC	Hydrologic Unit Code
IM	Instruction Memorandum
Kautz	Kautz Environmental Consultants, Inc.
KOP	Key Observation Point
kV	Kilovolt
kW	Kilowatt
L_{50}	Average noise level
L_{90}	Residual ambient noise level
lb	Pound
lbs	Pounds
LCRS	Leak Collection and Recovery System
L_{dn}	Day/night average sound level
L_{eq}	Average, or equivalent, sound level

L_{max}	Hourly maximum noise level
LNG	Liquid Natural Gas
LR2000	Legacy Rehost 2000 System
LTFM	Long-Term Funding Mechanism
LUPA/FEIS	Nevada and Northeastern California Greater Sage-Grouse Proposed Land Use Plan Amendment and Final EIS
mg/L	Milligrams per Liter
MLFO	Mount Lewis Field Office
MLRA	Major Land Resource Area
mm/yr	Millimeters Per Year
MMI	McEwen Mining Inc.
MMPA	Mining and Mineral Policy Act of 1970
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
mph	Miles Per Hour
MSHA	Mine Safety and Health Administration
Mt	Million Tons
Mt. Wheeler	Mt. Wheeler Power, Inc.
Mt/y	Million Tons Per Year
mv	Millivolts
MWMP	Meteoric Water Mobility Procedure
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NaCN	Sodium Cyanide
NAG	Net Acid Generation
NAGPRA	Native American Graves Protection and Repatriation Act
$NaNO_3$	Sodium Nitrate
NaOH	Sodium Hydroxide
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NNHP	Nevada Natural Heritage Program
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOI	Notice of Intent
NO_x	Nitrogen Oxides
NP	Neutralization Potential
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places

NRS	Nevada Revised Statutes
NST	National Scenic Trails
NTSA	National Trails System Act of 1968
O_3	Ozone
OHMA	Other Habitat Management Areas
OHV	Off-Highway Vehicle
OHWM	Ordinary High Water Mark
OPLA-PRP	Omnibus Public Land Management Act of 2009 Paleontological Resources Preservation
ORP	Oxidation-Reduction Potential
PAG	Potentially Acid Generating
Pb	Lead
$PbNO_3$	Lead Nitrate
PCPI	Per Capita Personal Income
PCS	Petroleum-contaminated Soils
PEL	Pick East Lower
PFYC	Potential Fossil Yield Classification
PHMA	Priority Habitat Management Areas
Plan	Plan of Operations
PLS	Pregnant Leach Solution
PM_{10}	Particulate matter less than 10 microns
$PM_{2.5}$	Particulate matter less than 2.5 microns
ppb	Parts per Billion
ppm	Part per Million
Project	Gold Bar Mine Project
PSD	Prevention of Significant Deterioration
PWR	Public Water Reserves
R	Range
RCRA	Resource Conservation and Recovery Act
REA	Rapid EcoRegional Assessment
ReGAP	Regional Gap Analysis Project
RFFA	Reasonably Foreseeable Future Action
RMCD	Roberts Mountain Charcoal District
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-Way
RV	Recreational Vehicle
SARA	Superfund Amendments and Reauthorization Act
SCP	Spill Contingency Plan
SDS	Safety Data Sheets
SEC	Sagebrush Ecosystem Council
SEP	Sagebrush Ecosystem Program
SETT	Sagebrush Ecosystem Technical Team
SHPO	State Historic Preservation Office
SiO_2	Silica
SIR	Scientific Investigation Report

SO_2	Sulfur Dioxide
SR	State Route
SRK	SRK Consulting (U.S.) Inc.
Stantec	Stantec Consulting Services Inc.
STM	State-and-Transition Models
T	Township
TCP	Traditional Cultural Property
TDS	Total Dissolved Solids
TNW	Traditional Navigable Waters
tpy	Tons Per Year
U.S.	United States
U.S.C.	United States Code
UNR	University of Nevada, Reno
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UUD	Unnecessary or Undue Degradation
V	Volt
VFS	Volunteer Fire Service
VOC	Volatile Organic Compound
VRM	Visual Resource Management
WFRHBA	Wild Free-Roaming Horses and Burros Act of 1971
WOUS	Waters of the United States
WPCP	Water Pollution Control Permit
WRCC	Western Regional Climate Center
WRDA	Waste Rock Disposal Area
WSA	Wilderness Study Area

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CHAPTER 1
INTRODUCTION

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Chapter 1 Introduction

1.1 Introduction and General Location

In December 2013, McEwen Mining Inc. (MMI) submitted a Plan of Operations (Plan) (NVN-091037) and Nevada Reclamation Permit Application for the Gold Bar Mine Project (Project) to the Mount Lewis Field Office (MLFO) of the Battle Mountain District Bureau of Land Management (BLM) and Nevada Division of Environmental Protection (NDEP), Bureau of Mining Regulation and Reclamation (BMRR). A revised Plan was submitted in February 2014, December 2015, and May 2016.

The Plan was submitted to comply with Title 43 Code of Federal Regulations (CFR), subpart 3809 (43 CFR 3809.401 *et seq*., as amended), State of Nevada regulations governing the reclamation of mined lands (Nevada Administrative Code [NAC] 519A.010-635), and BLM Instruction Memorandum (IM) No. NV-2011-004-Guidance for Permitting 3809 Plans of Operation. The 43 CFR 3809 regulations require that the BLM fulfill its obligation under the National Environmental Policy Act of 1969 (NEPA) by analyzing and disclosing the potential environmental impacts of the proposed Project. The Plan is on file and available for public review at the BLM MLFO in Battle Mountain, Nevada, during regular business hours (Monday through Friday, excluding holidays, from 7:30 AM to 4:30 PM PST).

The proposed Project is located approximately 30 miles northwest of Eureka in the southern Roberts Mountains in Eureka County, Nevada. **Figure 1.1-1** depicts the Project location within the State of Nevada. Total proposed Project disturbance would be approximately 1,129 acres of surface disturbance with approximately 946 acres on public land administered by the BLM MLFO and 183 acres on private land. The private and public lands are shown on **Figure 1.1-2**. The Plan boundary encompasses 5,362 acres of public land and 199 acres of private land located within all or portions of the following Townships (T), Ranges (R), and Sections relative to the Mount Diablo Base and Meridian (**Table 1.1-1**):

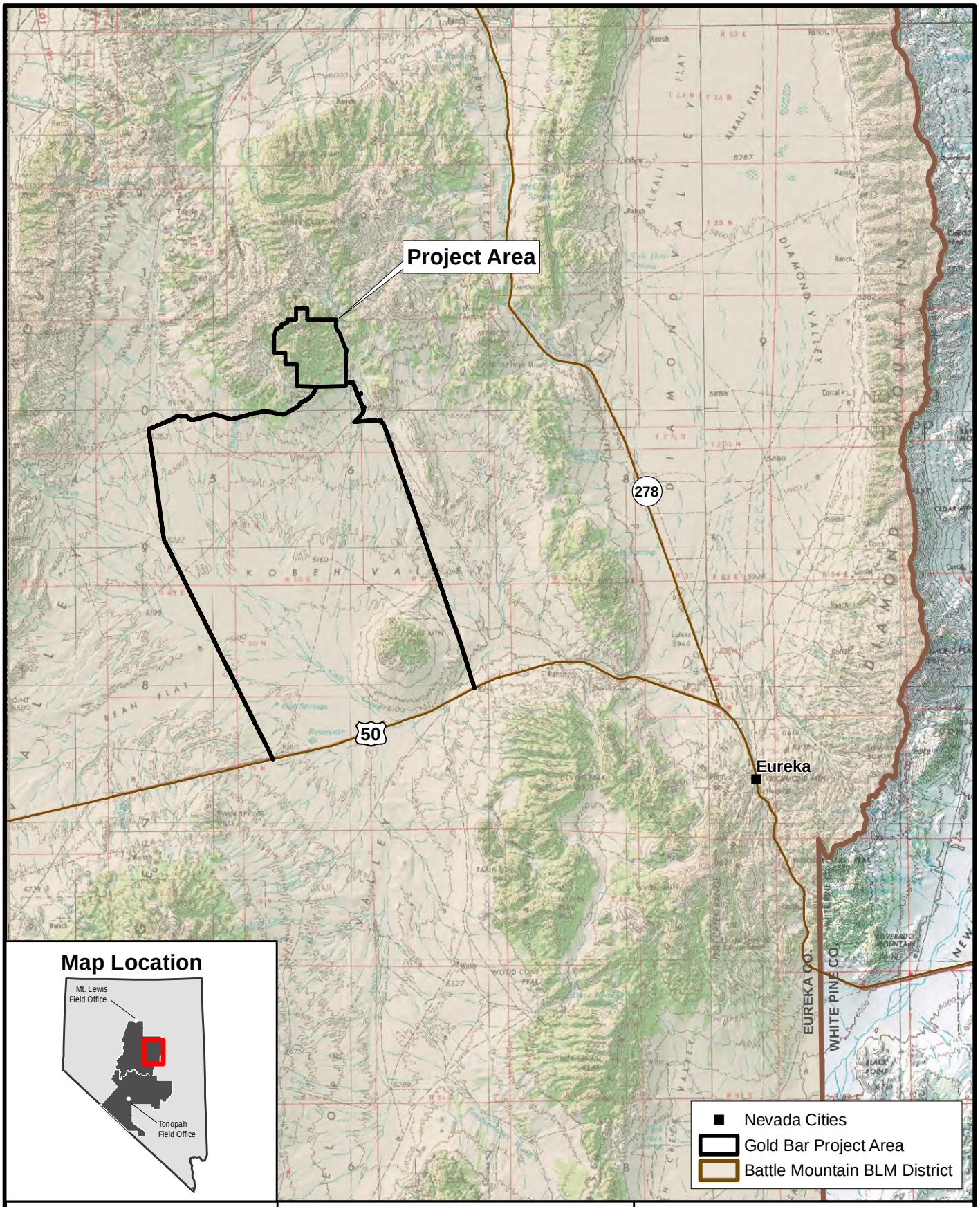
Table 1.1-1 Project Legal Description

Townships	Ranges	Sections
22 North	50 East	1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15, 21, 22, 24, 25, 28, 29, 30
22 North	49 East	25, 26, 27, 28, 33
21 North	49 East	4, 9, 16, 21, 22, 27, 34
20 North	49 East	3, 10, 11, 14, 23, 24, 25, 36
20 North	50 East	31
19 North	50 East	6, 7, 8, 17
22 North	51 East	30, 31, 32
21 North	51 East	5, 8, 9, 16, 21, 27, 28, 34
20 North	51 East	3, 10, 15, 22, 23, 26, 35
23 North	50 East	34

MMI, through its wholly owned subsidiaries White Knight Gold (U.S.) Inc., WKGUS LLC, Quito Gold Corp., and Golden Pick LLC, controls 310 unpatented lode mining claims and one parcel (Eureka County Assessor's Parcel Number 009-160-01) of privately owned land in the Gold Bar Project area. All private land within the mine Project area is owned by Golden Pick LLC (MMI, 2016a).

The BLM is serving as the lead agency for preparing the Environmental Impact Statement (EIS) in compliance with the following: the NEPA; the Council on Environmental Quality (CEQ) NEPA implementing regulations (40 CFR 1500-1508); the BLM's NEPA Handbook (H-1790-1); Nevada State Office IM NV-90-435, BLM-wide Guidance on Cumulative Effects Analysis (July, 2005); Nevada State Office IM NV-2010-014, Nevada BLM Rock Characterization and Water Resources Analysis Guidance for Mining Activities (January 2010); Nevada BLM State Office IM NV-2008-032, Nevada BLM Water Resource Data and Analysis Policy for Mining Activities (April 2008); CEQ's 2005 Guidance on the Consideration of Past Actions in Cumulative Effects Analysis; and other applicable guidance (BLM, 1994a, 2008a, 2008b, 2010a; USEPA CEQ, 2005). Eureka County is an official cooperating agency for preparation and review of the EIS, as outlined in the Memorandum of Understanding (MOU) (BLM-NV-MOU-LLNVB01000-2016-004). The BLM and the United States (U.S.) Environmental Protection Agency (EPA) have an agency-wide MOU for coordination on NEPA projects, and the EPA has actively coordinated with the BLM on this EIS. Although not under an MOU, the Nevada Department of Wildlife (NDOW), National Park Service (NPS), and the United States Fish and Wildlife Service (USFWS) have also actively coordinated with the BLM on the preparation of this EIS. The EIS considers the quality of the natural environment based on the physical impacts to the public and private lands that may result from implementation of the proposed Project. The Plan and all baseline data reports used in the preparation of the EIS are on file at the BLM MLFO.

The proposed Project is subject to review and approval by the BLM pursuant to the Federal Land Policy and Management Act of 1976 (FLPMA) as amended, and the BLM's 3809 Surface Management Regulations. Review of the Plan by the BLM under the Surface Management Regulations has concluded that the approval of the proposed Project would constitute a major federal action since the proposed Project may have significant effects on the human and natural environment. Consequently, the BLM has determined that an EIS should be prepared for this proposed Project to fulfill its NEPA requirements.



Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 6 12 Miles
1 in = 6 miles
N

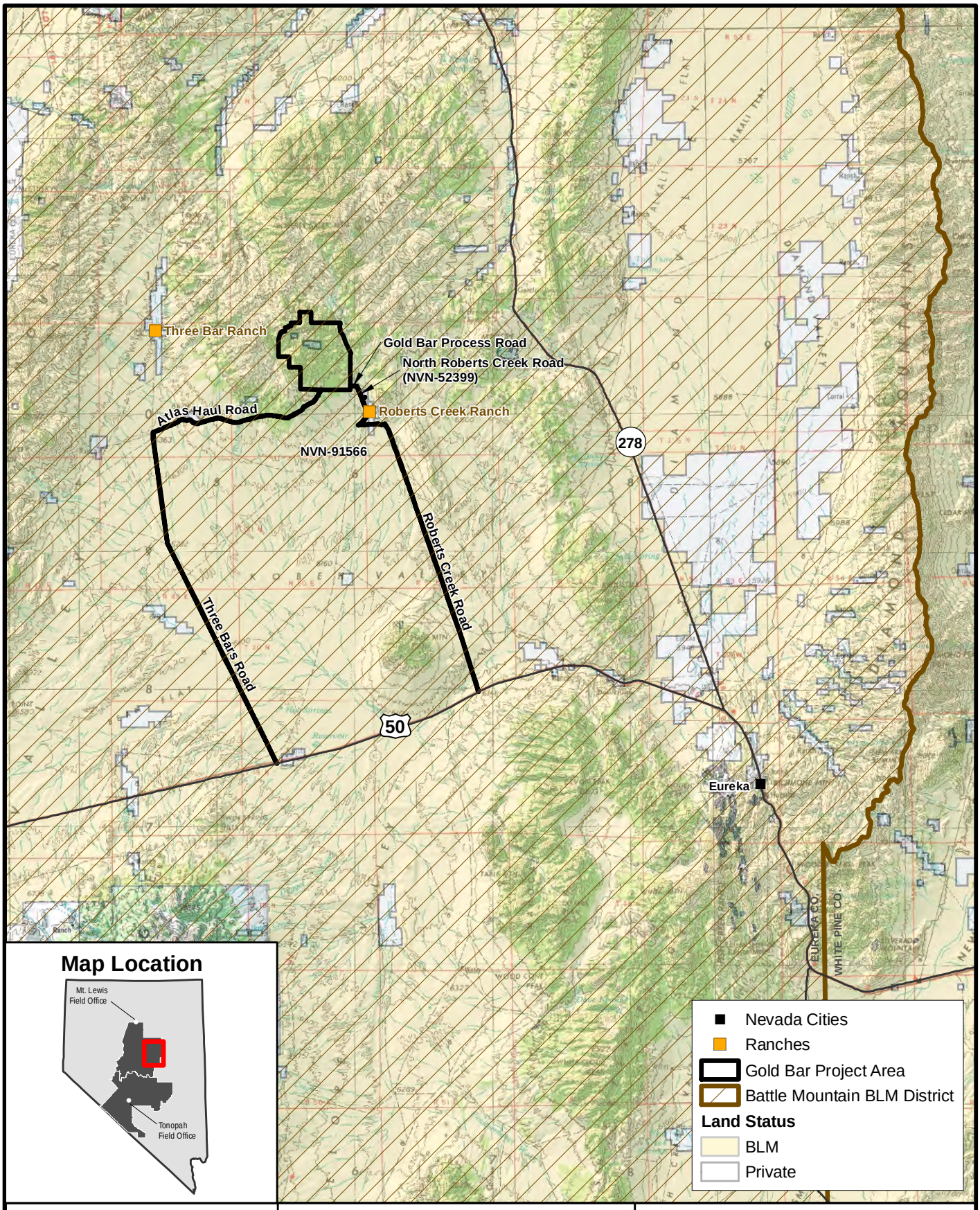
GENERAL LOCATION MAP

FIGURE 1.1-1

1/31/2017

REVISION
A

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.



Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 6 12 Miles
1 in = 6 miles
N

LAND OWNERSHIP

FIGURE 1.1-2

1/31/2017

REVISION
A

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

This document is required to follow CEQ regulations at 40 CFR 1500 *et seq.* that implement the NEPA. These regulations establish procedural and content requirements for NEPA documents. In order to comply with the CEQ regulations, NEPA documents must: 1) analyze the impacts of the proposed Project; 2) identify and analyze reasonable alternatives; 3) inform the public about the proposed Project and alternatives; 4) acquire and synthesize information needed to make informed decisions using an interdisciplinary approach; 5) solicit public comment on the proposed Project and alternatives; and 6) provide federal decision-makers with adequate information upon which to base decisions. Pursuant to 40 CFR 1508.25, in determining the scope of analysis, the BLM must consider the range of actions, alternatives, and impacts to be considered in an EIS. To determine the scope of an EIS, the BLM considers three types of actions, alternatives, and impacts. The three types of actions include: connected actions; alternatives; and similar actions. The types of alternatives considered include the no action alternative and other reasonable action alternatives.

1.2 Summary of the Proposed Action

The Proposed Action to be evaluated in the EIS includes an open pit gold mine, a water pipeline, and access roads. The Project would consist of:

- Four open pits;
- Waste rock disposal areas (WRDAs);
- Crushing, screening, and agglomeration facilities;
- Heap leach pad (HLP), associated process solution pond, and an event pond;
- An adsorption, desorption, and recovery (ADR) plant including barren and pregnant solution tanks;
- Ancillary and other facilities including:
    - Explosive storage area;
    - Prill silos;
    - Liquid natural gas (LNG) Cryostorage, or compressed natural gas (CNG) generators and switch station;
    - Truck shop and wash bay;
    - Ready line;
    - Landfill, laydown areas;
    - Water and power infrastructure;
    - Buildings;
    - Yards;
    - Parking;
    - Storage;
    - Growth media stockpiles;
    - Production water wells (GBPW-210 and GBPW-211) and associated water supply pipeline;
    - Groundwater monitoring wells (GBMW-01, GBMW-03, and GBMW-04);

    - Communication facilities;
    - Potable water and fire water facilities;
    - Septic systems, and fencing;

- Mine access roads:
    - Three Bars Road;
    - Atlas Haul Road;
    - North Roberts Creek Road (NVN-052399);
    - Bypass Road (NVN-91566); and
    - Roberts Creek Road.

Construction and operation of the proposed mining facilities would result in approximately 1,129 acres of surface disturbance, which includes existing and proposed disturbance. Approximately 25 acres of existing non-MMI disturbance would also be reclaimed as part of the Proposed Action, which is classified as disturbance in the Plan but would not be directly disturbed by Project operations. Total Project disturbance associated with the proposed mine facilities, including the 25 acres of existing non-MMI disturbance to be reclaimed and exploration disturbance authorized under previous Notices would be 1,154 acres.

Preliminary mine design consists of a single pit for each of the Gold Pick and Gold Ridge deposits and two pits in the Cabin Creek area. Mineral recovery would be performed during a projected seven-year mine life. The Project schedule would be as follows: four months of pit pre-stripping; one year of construction; seven years of mining operations (i.e., five years of active mining and two years of residual heap leaching); approximately six years of reclamation following cessation of mining and active leaching on the HLP; and approximately 4.5 years of monitoring after reclamation is completed.

1.3 Purpose of and Need for the Action

1.3.1 Purpose and Need

The BLM is responsible for administering mineral rights access on certain federal lands as authorized by the General Mining Law of 1872. Under the law, qualified prospectors are entitled to reasonable access to mineral deposits on public domain lands, which have not been withdrawn from mineral entry. In order to use public lands managed by the BLM for locatable mineral exploration and development, persons must comply with FLPMA and BLM's Surface Management Regulations, State of Nevada laws and regulations applicable to mine reclamation, and other applicable statutes and regulations.

MMI is proposing to extract ore from public lands where it holds mining claims, as well as on MMI controlled private lands.

The purpose of this federal action and associated EIS is to analyze the environmental impacts associated with MMI’s Proposed Action. The NEPA mandates the BLM evaluate the impacts of

the proposed Project and develop alternatives and mitigation, when necessary, to lessen any impacts to environmental resources (40 CFR 1502).

The need for the federal action is established by the BLM's responsibilities under FLPMA to respond to an applicant's request for approval of a Plan of Operations for the applicant to exercise their rights under the General Mining Law of 1872. Additional aspects of the need of the federal action are:

1) to further the "Minerals" objective of the applicable BLM Resource Management Plan, which is to "…provide opportunity for exploration and development of locatable minerals, such as gold, silver, copper, lead, molybdenum, etc., consistent with the preservation of fragile and unique resources in areas identified as open to the operations of the mining laws."; and

2) "...to provide for mining and reclamation of the Project area in a manner that is environmentally responsible and in compliance with federal mining laws, including preventing unnecessary or undue degradation of public lands, FLPMA, State of Nevada laws and regulations applicable to mine reclamation, and other applicable laws and regulations."

1.3.2 Decision to be Made

The BLM's MLFO Manager would decide whether to permit the proposed Project as described within the Plan, as submitted, or modify the decision based on the potential unnecessary or undue degradation (UUD), impacts analysis, and associated mitigation, as identified in this EIS.

1.4 Land Use Plan Conformance

1.4.1 BLM Resource Management Plan

1.4.1.1 Shoshone-Eureka Resource Management Plan

The Proposed Action conforms with the BLM's Shoshone-Eureka Resource Management Plan (RMP), as amended, dated March 1986 (BLM, 1986a). Specifically, on page 29 in the Shoshone-Eureka RMP Record of Decision (ROD), under the heading "Minerals" subtitled "Objectives" number 1:

> "Make available and encourage development of mineral resources to meet national, regional, and local needs consistent with national objectives for an adequate supply of minerals."

Under "Management Decisions", "Locatable Materials" page 29, number 1:

> "All public lands in the planning areas will be open for mining and prospecting unless withdrawn or restricted from mineral entry."

Under “Management Decisions”, number 5, “Current Mineral Production Areas”:

> “Recognize these areas as having a highest and best use for mineral production and encourage mining with minimum environmental disturbance...” (BLM, 1986a).

1.4.1.2 Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment

The Proposed Action is consistent with the Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA) (BLM, 2015a). The BLM prepared the ARMPA to identify and incorporate appropriate measures in existing land use plans. It is intended to conserve, enhance, and restore greater sage-grouse (*Centrocercus urophasianus*) habitat by avoiding, minimizing, or compensating for unavoidable impacts on greater sage-grouse habitat in the context of the BLM’s multiple use and sustained yield mission under FLPMA (BLM, 2015a).

A table of the management decisions and required design features from the ARMPA are provided in **Appendix A**. The table also identifies whether or not the measure is applicable to the Project, and whether the proposed Project is consistent with each measure.

1.4.2 Surface Management Authorizations and Plan

BLM authority derives from the FLPMA. BLM regulations for the surface management of BLM administered land affected by mining were promulgated as 43 CFR 3809 in 1981 and revised in 2001, and derive their mandate from Sections 302 and 303 of the FLPMA. MMI submitted their Plan for the proposed Project as required by the 43 CFR 3809 regulations. In order to use public land administered by the MLFO, MMI must comply with the BLM Surface Management Regulations (as amended) (43 CFR 3809) and other applicable statutes, including the Mining and Mineral Policy Act of 1970 (MMPA) (as amended), and the FLPMA. The BLM has the responsibility and authority to manage the surface and subsurface resources on public lands located within the jurisdiction of the MLFO.

The General Mining Law of 1872 allows individuals to locate and patent mining claims, such as lode claims. On federal lands open to mineral location, lode claims provide the claimant with a possessory interest (right) limited to exploring for and developing ores contained in mineralized rock. Title to the claims (patent) may be conveyed only with a valid discovery of commercially profitable ore. Since 1994, Congress has maintained a moratorium on BLM processing of mineral patent applications. Under the mill site provision, 30 United States Code (U.S.C.) 42, no location of a claim on non-mineral lands, called mill sites, may exceed five acres each. However, more than one mill site claim can be located if each site is used for at least one of the purposes described in 43 CFR Section 3832.34. The amount of located mill site acreage is that which is reasonably required for use or to be occupied for efficient and reasonably compact mining or milling operations.

The BLM has reviewed MMI's Plan and has prepared this EIS to ensure compliance with these surface management requirements and the requirements of NEPA.

1.4.3 BLM Cyanide Management Plan

The BLM's national cyanide management policy requires that BLM state offices prepare a Cyanide Management Plan. The Nevada State Office of the BLM has prepared and administers the Cyanide Management Plan (BLM, 1992a). The Cyanide Management Plan is applicable to all BLM-administered lands in Nevada and would be applicable to the proposed Project's cyanide heap leaching activities and relevant precious metal recovery processes. The Plan provides guidance on cyanide use in mining activities and lists the following objectives:

- Implement the BLM's national cyanide management policy;
- Ensure that mining operations using cyanide on BLM-administered lands follow Best Management Practices (BMPs) and do not cause UUD of the federal lands;
- Provide both the mine operator and the BLM technical staff with standards for development and evaluation of mining projects that use cyanide; and
- Use state standards, if established.

The Cyanide Management Plan is not intended to duplicate requirements of other federal or state agencies with responsibility for managing the use of cyanide in mining operations. Where standards are established for mining operations by the State of Nevada through the NDEP BMRR, they shall apply when reviewing the Cyanide Management Plan. The BLM has reviewed the Plan for the proposed Project to ensure that it is in conformance with the Cyanide Management Plan.

1.4.4 BLM Reclamation Standards

The MMPA mandates that federal agencies ensure that closure and reclamation of mine operations be completed in an environmentally responsible manner. The MMPA states that the federal government should promote the "development of methods for the disposal, control, and reclamation of mineral waste products, and the reclamation of mined lands, so as to lessen any adverse impact of mineral extraction and processing upon the physical environment that may result from mining mineral activities."

Relevant BLM policy and standards for reclamation are presented in the BLM Manual Handbook H-3042-1: Solid Minerals Reclamation Handbook (BLM, 1992a) that provides consistent reclamation guidelines for all solid non-coal mineral activities conducted under the authority of the BLM Minerals Regulations in 43 CFR 3809. BLM's short-term reclamation standards and goals include stabilization of disturbed areas and protection of both disturbed and adjacent undisturbed areas from UUD. The BLM's long-term reclamation standards and goals include the establishment of a self-sustaining, safe, and stable condition providing productive post-mining use of the land that conforms to the approved land use plan for the area. The BLM has reviewed the Reclamation Plan for the proposed Project to ensure that the proposed Project would meet BLM's reclamation

standards and goals. The proposed Project also would be required to obtain a reclamation permit from, and meet the reclamation standards of, the State of Nevada Department of Conservation and Natural Resources and the NDEP BMRR.

1.4.5 Relationship to County Policies

The Eureka County 1973 Master Plan, updated in 2000 and again in 2010, contains planning elements with goals and objectives to provide a long-term plan for the physical development of Eureka County and to provide mechanisms to address immediate growth management issues (Eureka County, 2010). The Eureka County Master Plan 2010 includes an Economic Development Element which incorporates recommendations for increased land use planning that expands and diversifies the County's economy. The Natural Resources and Federal or State Land Use Element was developed and incorporated into the Master Plan in response to Nevada Senate Bill 40, which was passed in 1983, which directs counties to develop plans and strategies for resources that occur within lands managed by federal and state agencies. The Natural Resource and Federal or State Land Use Element provides a framework for establishing community planning goals and provides details of goals and actionable objectives for a number of high-priority land use issues. Goals and objectives within the Eureka County Master Plan promote environmentally responsible exploration, development, reclamation, and the retention of and compliance with the General Mining Law of 1872 (Eureka County, 2010).

The Natural Resources and Federal or State Land Use Element is an executable policy for natural resource management and land use on federal and state administered lands in Eureka County. This element is designed to accomplish the following: 1) protect the human and natural environment of Eureka County; 2) facilitate federal agency efforts to resolve inconsistencies between federal land use decisions and County policy; 3) enable federal and state agency officials to coordinate their efforts with Eureka County; and 4) provide strategies, procedures, and policies for progressive land and resource management (Eureka County, 2010). The BLM acknowledges that MMI would have to comply with any applicable Eureka County codes. Consideration with the goals and policies in the Eureka County Master Plan have been included into **Appendix B** in order to provide a comprehensive analysis of Project compliance and potential conflicts with the Master Plan in one location in the Draft EIS (DEIS).

1.5 Environmental Review Process

Numerous opportunities for public input occur during the NEPA decision-making process. The initial step in the EIS process was to notify the public and other government agencies of the BLM's intent to prepare an EIS. The BLM published a Notice of Intent (NOI) to prepare an EIS for the proposed Project in the Federal Register on September 11, 2015. This initiated a 30-day public scoping period for the proposed Project. The purpose of public scoping is to actively solicit and acquire input from the public and other interested federal, state, tribal, and local agencies about the proposed Project. The BLM hosted one public scoping meeting for the proposed Project in the town of Eureka Nevada, on October 6, 2015. The BLM received 12 comment letters during the scoping period.

The following are issues that represent public and the BLM Interdisciplinary Team concerns about the proposed Project:

- How will the Project's emissions affect air quality, greenhouse gas emissions, and climate change;
- How will the Project affect cultural resources, forest and woodland products, grazing management, paleontological resources, recreation resources, soils, wildlife including migratory birds, vegetation, and visual resources;
- What are the impacts from noxious weeds and invasive species from the Project;
- What are the impacts to threatened and endangered species as well as special status species, specifically greater sage-grouse, burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), pinyon jay (*Gymnorhinus cyanocephalus*), black-throated gray warbler (*Setophaga nigrescens*), and Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*);
- What are the potential impacts from noise from the Project;
- What are the results of consultation with Native American Tribes on potential impacts from the Project;
- How will hazardous and solid wastes from the Project be managed;
- What are the potential impacts from the Project to surface and ground water quantity and quality, local water rights, and wetlands and riparian zones;
- Are there potential impacts to environmental justice from the Project;
- What are the potential impacts to social and economic values from the Project; and
- What are the potential impacts to wild horses and their habitat from the Project?

Information received during the public scoping period assists the BLM in identifying potential environmental issues/impacts, alternatives, and mitigation measures associated with the development of the proposed Project.

After completion of the public scoping period, this DEIS was prepared and addresses the environmental effects associated with the proposed Project including the issues and concerns identified during the scoping period. Upon publishing this DEIS through the Notice of Availability in the Federal Register, the public has the opportunity to comment on the DEIS during a 45-day comment period.

1.6 Project Permits and Approvals

In addition to the EIS, implementing the Proposed Action would require authorizing actions from other federal, state, and local agencies with jurisdiction over certain aspects of the proposed Project. **Table 1.6-1** lists the required permits or approvals that are already in place or would be obtained and the responsible regulatory agencies. MMI is responsible for amending existing permits, and applying for and acquiring additional permits, as needed.

Table 1.6-1 List of Potential Permits and Approvals

Permit/Authorization	Granting Agency
Federal Permits, Approvals and Reviews	
EIS and ROD Plan of Operations	U.S. Department of the Interior, BLM
Endangered Species Act of 1973 (ESA); 16 U.S.C. 1531 et seq.	USFWS
Explosives Permit	U.S. Bureau of Alcohol, Tobacco, and Firearms
EPA Hazardous Waste ID No.	EPA
Notification of Commencement of Operations	Mine Safety and Health Administration (MSHA)
Section 106 National Historic Preservation Act, 18 U.S.C. Section 841-848; 27 CFR 181	U.S. Department of the Interior, BLM and the State of Nevada Historical Preservation Office
Federal Communications Commission (FCC) Permit	FCC
State of Nevada Permits	
Air Quality Operating Permit Air Quality Permit to Construct Surface Air Disturbance Permit	NDEP/Bureau of Air Pollution Control
Mercury Operating Permit and Mercury Operating Permit to Construct	NDEP/Bureau of Air Quality Planning/Nevada Mercury Air Emissions Control Program
Permit to Appropriate Water Dam Safety Permit	Nevada Division of Water Resources
Water Pollution Control Permit Mining Reclamation Permit	NDEP/BMRR
Class III Waivered Landfill Permit	NDEP/Bureau of Waste Management (BWM)
Solid Waste Permit	NDEP/Bureau of Waste Management
Encroachment Permit	Nevada Department of Transportation
General Stormwater Discharge Permit Septic Treatment Permit Sewage Disposal System Permit Stormwater Pollution Prevention Plan	NDEP/Bureau of Water Pollution Control
Potable Water System Permit	Nevada Bureau of Safe Drinking Water
Nevada Mine Registry	Nevada Division of Minerals
Fire and Life Safety Permit Hazardous Materials Storage Permit	Nevada Fire Marshall
Hazardous Waste Management Permit	NDEP/BWM
Industrial Artificial Pond Permit	NDOW
State Business License	Nevada Secretary of State

Permit/Authorization	Granting Agency
Local Agreements	
County Road Use and Maintenance Permit/Agreement	Eureka County Board of Commissioners and Public Works Department

1.7 Organization of the Environmental Impact Statement

The remainder of the Gold Bar Mine EIS is organized into six chapters as described below.

Chapter 2.0 provides detailed information regarding existing disturbance at the Project, the description of the Proposed Action including reclamation and environmental protection measures (EPM), action alternatives, the No Action Alternative, and alternatives considered but eliminated from detailed analyses. Numerous figures are provided that illustrate the Proposed Action or action alternatives. This section also provides a summary table of the impacts associated with each alternative and the BLM's preferred alternative.

Chapter 3.0 describes the existing natural and human environment resources within the study area for each resource.

Chapter 4.0 describes the potential direct and indirect impacts to natural and human environment resources with the implementation of the Proposed Action and alternatives; cumulative impacts to these resources with the implementation of the Proposed Action and alternatives in combination with impacts contributed by other past, present, and reasonably foreseeable future actions; monitoring and mitigation measures developed to avoid or minimize resource impacts; and residual impacts to these resources after the implementation of proposed monitoring and mitigation measures. This chapter also discusses the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and irreversible and irretrievable commitment of resources.

Chapter 5.0 provides a summary of the public participation and scoping process used to solicit comments on the Proposed Action and alternatives and identify issues or concerns; consultation and coordination undertaken to prepare the EIS; a list of federal, state, and local agencies, tribal organizations, and private organizations and companies that were contacted during the preparation of the EIS; and agencies, organizations, and persons to whom copies of the EIS were sent. Chapter 5.0 also provides a list of lead and cooperating agency personnel and Stantec Consulting Services Inc.'s (Stantec's) team members that developed the EIS document.

Chapter 6.0 lists the references that were used in the EIS to document the source or sources of information and includes a glossary of terms the readers can use to obtain definitions for scientific or technical terms.

Appendices included in the EIS provide supplemental detailed information used to support statements or findings documented in the EIS.

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CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

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Chapter 2 Proposed Action and Alternatives

2.1 Introduction

This chapter describes the Proposed Action, three action alternatives, and the No Action Alternative, in compliance with 40 CFR 1502.14. The details of the proposed mine development are summarized from the MMI Plan (MMI, 2016a). Figures are included that clearly show the components of the proposed Plan.

In addition to the Proposed Action, three action alternatives are evaluated in detail in this EIS. These alternatives were developed to address issues identified by BLM resource specialists and from comments received during the public scoping process. The alternatives were evaluated for their potential to reduce or minimize impacts associated with the Proposed Action. The action alternatives are described in Section 2.3. The No Action Alternative (Section 2.3.1) is also considered, as required in the CFR (40 CFR 1502.14(d)). As discussed in Section 2.4, several additional potential alternatives were considered, but were eliminated from detailed consideration in this EIS when it was determined that they were not reasonable or economically feasible or would not substantially reduce potential impacts associated with the Proposed Action or other action alternatives. Section 2.5 compares the impacts from the alternatives analyzed in the EIS.

2.2 Proposed Action

The description of the Proposed Action is based on the Plan submitted by MMI to the BLM in December 2013, revised in February 2014, December 2015, and May 2016 (MMI, 2016a). Readers desiring greater detail can review the descriptions, maps, and drawings available in the Plan, which is available at the BLM Battle Mountain District Office, located at 50 Bastian Road, Battle Mountain, NV 89820.

2.2.1 Mining Operations

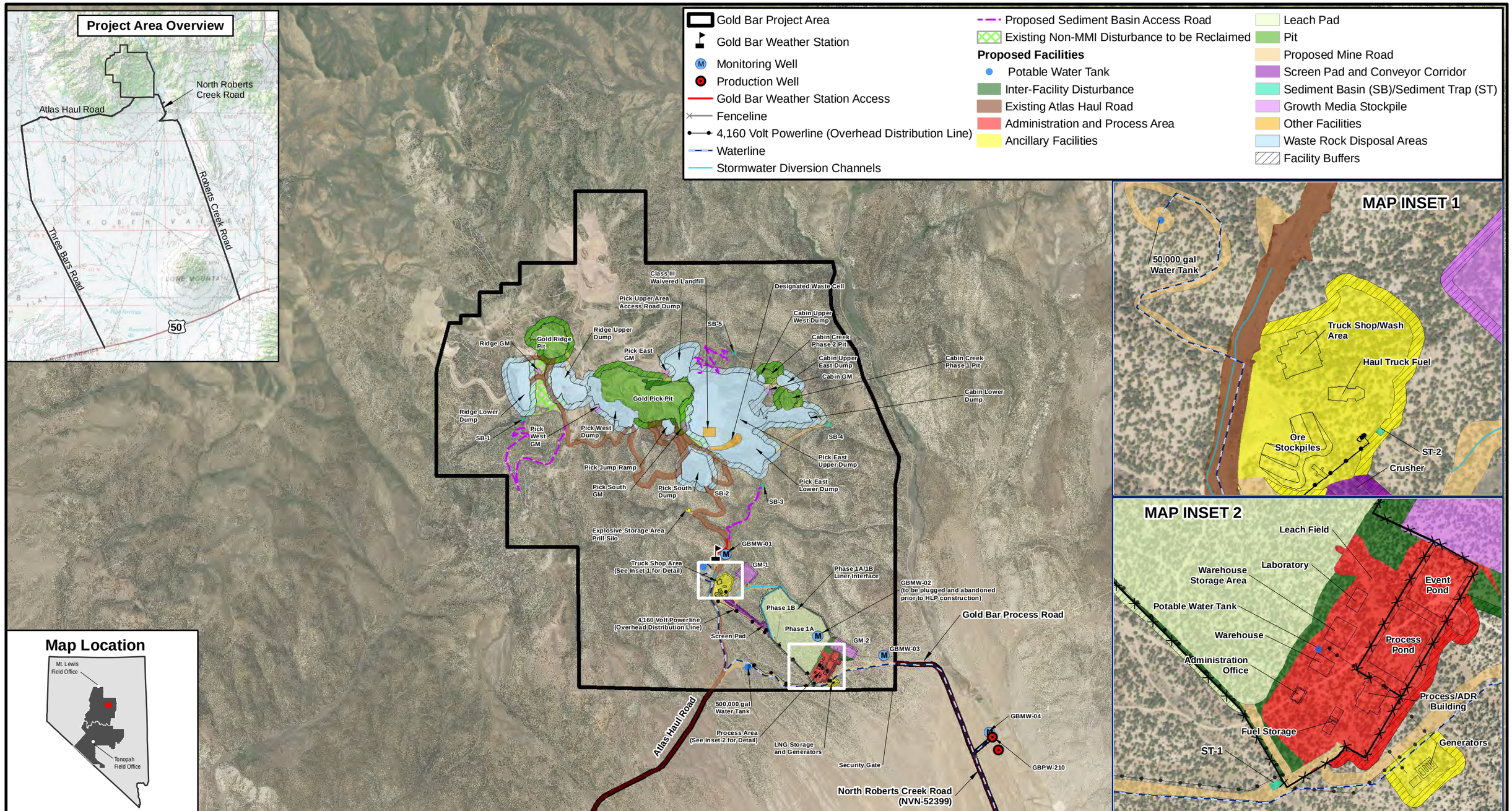
MMI proposes to develop the Project in the southern Roberts Mountains in central Nevada approximately 30 miles northwest of Eureka, Nevada. The Project would be located primarily on public land administered by the BLM MLFO and on private land controlled by MMI.

The Project would involve extracting gold via open pit mining and heap leach beneficiation of ore from the deposits known as Gold Pick, Gold Ridge, and Cabin Creek. The preliminary mine design consists of a single pit for each of the Gold Pick and Gold Ridge deposits and two pits in the Cabin Creek area. Open pit mining operations would be performed during a projected seven-year period (i.e., five years of active mining and leaching plus two years of residual leaching). The proposed facilities are shown on **Figure 2.2-1**.

The Gold Pick and Gold Ridge satellite deposits were mined by the Atlas Corporation between 1986 and 1994, and included the construction of open pits, WRDAs, and extensive exploration disturbance. The area was abandoned in 1999 when Atlas filed for bankruptcy, leaving nearly 654 acres of unreclaimed disturbance within MMI's currently proposed Project boundary. The Project would utilize approximately 395 acres of this existing unreclaimed disturbance, including the existing disturbance associated with North Roberts Creek Road, for which MMI would assume full reclamation liability. In addition, MMI would reclaim approximately 25 acres of existing non-MMI disturbance, which would not be disturbed during Project operations, but would be reclaimed by MMI making total existing disturbance associated with Project mining activities to be reclaimed approximately 420 acres. In addition to the 420 acres of existing disturbance, MMI proposes disturbance to 718 acres of previously undisturbed ground, and to incorporate 16 acres of Notice (exploration) disturbance for a total Project disturbance of 1,154 acres (**Table 2.2-1)**.

MMI would commence work outlined in the Plan upon approval from the BLM and issuance of the required permits from the Nevada Department of Conservation and Natural Resources, NDEP-BMRR, and other relevant federal, state, and local federal regulatory agencies. Existing disturbance within the Project footprint on public and private land, and proposed new disturbance is summarized in **Table 2.2-1. Table 2.2-1** includes non-MMI disturbance to be reclaimed. Non-MMI disturbance to be reclaimed is not factored in to the total Project disturbance discussed throughout this EIS; however, the non-MMI disturbance to be reclaimed is included in **Table 2.2-1** and discussed throughout this EIS for reclamation purposes.

The Project is scheduled to operate on two, 10- or 12-hour shifts per day. Active mining would occur for 360 days per year and leaching would occur for 365 days per year. The mine life is estimated to be seven years (i.e., five years of active mining and leaching plus two additional years of residual heap leaching) with an additional four months of pit pre-stripping. Life-of-mine mining rate averages are estimated at 2.6 million tons per year (Mt/y) of ore and approximately 14.5 Mt/y of waste rock.



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0 3,500 7,000 Feet
1 in = 3,500 feet

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PROPOSED FACILITIES

FIGURE 2.2-1

REVISION **A**

1/31/2017

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Table 2.2-1 Proposed Action Disturbances

Component	Existing Authorized MMI Disturbance[1] (acres)	Pre-MMI Existing Disturbance[2]		Proposed New Disturbance[3]		Total Project Disturbance[4] (acres)
		Private (acres)	Public (acres)	Private (acres)	Public (acres)	
Open Pits						
Cabin Phase 1 Pit	0	0	2.2	0	6.2	8.4
Cabin Phase 2 Pit	0	0	0.9	0	3.4	4.3
Gold Pick Pit	0	56.1	2.2	36.5	4.6	99.4
Gold Ridge Pit	0	12.7	4.7	4.2	7.8	29.4
Waste Rock Disposal Areas						
Cabin Lower	0	0	1.3	0	18.2	19.5
Cabin Upper East	0	0	1.4	0	6.3	7.7
Cabin Upper West	0	0	0.2	0	1.5	1.7
Pick East Upper Access Road	0	0.01	8.9	0.1	10.1	19.1
Pick East Upper and Lower	0	18.4	44.7	3.5	119.3	185.9
Pick Jump Ramp	0	0.7	0.7	1.8	1.6	4.8
Pick South	0	0	6.8	0	19.7	26.5
Pick West	0	1.8	1.9	12	14.1	29.8
Ridge Lower	0	0	20.3	0	8.4	28.7
Ridge Upper	0	0	27		0.5	27.5
Existing Non-MMI Disturbance to be Reclaimed[5]	N/A	1.4	23.1	N/A	N/A	24.5
Screen Area and Conveyor Corridor	0	0	0	0	5.3	5.3
Growth Media Stockpiles	0	1.5	2.1	0.4	15.8	19.8
Administration and Process Area[6]	0	0	0.6	0	16.5	17.1
Exploration	16	0	0	0	49.1	65.1
Proposed Mine Road[7]	0	0.7	2.7	0	31.5	34.9
Existing Haul Road Proposed for use by MMI	0	3.6	92.1	0	0.1	95.8
Inter-facility Disturbance[8]	0	4.4	1.6	1.5	15.4	22.9
Heap Leach Facility	0	0	1.6	0	104.2	105.8
Ancillary Facilities: Explosive storage area, prill silos, crusher, ore stockpiles, truck shop, generators, and LNG storage area.	0	0	1.6	0.1	9.9	11.6

Component	Existing Authorized MMI Disturbance[1] (acres)	Pre-MMI Existing Disturbance[2]		Proposed New Disturbance[3]		Total Project Disturbance[4] (acres)
		Private (acres)	Public (acres)	Private (acres)	Public (acres)	
Class III-Waivered Landfill and Designated Waste Cell[9]	0	0	0	0	0	0
Sediment Basins	0	0	0.2	0	3.3	3.5
Existing North Roberts Creek Road[10]	0	0.2	6.7	0.3	9.7	16.9
Potential Ancillary Pit Disturbance[11]	0	10.2	8.0	7.4	36.8	62.4
Potential Ancillary Waste Rock Disposal Area Disturbance[11]	0	3.8	40.8	1.3	112.9	158.8
Potential Ancillary Disturbance[11]	0	0	0.1	0	16.3	16.4
Sub-Total	**16**	**115.5**	**304.4**	**69.1**	**648.5**	**1,153.5**
Total	**16.0**		**419.9**		**717.6**	

1. Notice-level exploration previously authorized (on public land).
2. Existing site disturbance by previous operators within the proposed Gold Bar Project boundary that would be used in by MMI in the proposed operations.
3. Proposed new disturbance for the proposed operations.
4. Total project disturbance (existing disturbance to be used plus new proposed disturbance).
5. Includes existing disturbance that would not be disturbed during Project operations, but would be reclaimed by MMI.
6. The Administration and Process Area includes the process pond, the event pond, process/adsorption, desorption and recovery building, the warehouse, the warehouse storage area, the laboratory, fuel storage, and the administration office.
7. Includes weather station access road.
8. Inter-facility disturbance includes interior access roads, sediment pond access roads, the portions of the water pipeline not within the disturbance footprint of another facility, and the portions of the power line corridor not within the disturbance footprint of another facility. Sediment pond access roads, the power line corridor, and the water pipeline were assumed to generate a 16-foot wide disturbance corridor.
9. Class III-Waivered Landfill and Designated Waste Cell are accounted for in the Pick East Upper WRDA and the Pick East Lower WRDA disturbance footprint.
10 North Roberts Creek Road existing disturbance width varies. These roads are assumed to be widened to 60 feet total road width. Portions of the water supply pipeline fall within the disturbance area for these two roads, and are included in the disturbance area for the roads.
11. Potential Ancillary disturbance areas consist of a buffer around proposed disturbance. Although no disturbance is proposed, the area may be disturbed only in the case of operators accidently grading or placing waste rock material outside of proposed disturbance footprints, or in the case of pit high wall failure. These areas are being permitted as if they would be disturbed.
Note: Access Roads (i.e., Three Bars Road, Atlas Haul Road, Roberts Creek Road, and Bypass Road) were not included in these disturbance calculations, as they are existing roads and would not be improved.

2.2.2 Roads

Seasonal timing restrictions are incorporated into the use of access roads to the Project from mine-related traffic. These seasonal restrictions would be implemented to reduce impacts to greater sage-grouse leks within four miles of the two access routes to the Project (i.e., Three Bars Road access routes and the Roberts Creek Road access route). These seasonal restrictions would reduce impacts to the greater sage-grouse leks within four miles of the access roads from noise and other impacts during lekking season. A discussion of impacts to greater sage-grouse from use of the access roads is detailed in Section 4.21. Heavy vehicle traffic would access the Plan boundary from U.S. Highway 50 by traveling north on the existing Three Bars Road for approximately 16 miles, and then east for 1.5 miles on the existing Gold Bar Road to the former Atlas Mill area. From the former mill area, access is gained to the east on the existing Atlas Haul Road for approximately seven miles to the mine facilities.

Employees would be transported to the mine facilities using three 12 to 15-passenger vans. Vans, pickup trucks, and automobiles are considered light vehicle traffic. Light vehicle traffic access to the mine facilities would be from U.S. Highway 50 and traveling north on the existing Roberts Creek Road for approximately 13 miles, then west on the Bypass Road for approximately one mile to North Roberts Creek Road, then northeast on North Roberts Creek Road for 0.6 mile, then northwest on North Roberts Creek Road for 1.5 miles to the proposed mine facilities. These access routes are described in more detail in Sections 2.2.13 and 2.2.14. The Project does not propose any improvements to Three Bars Road (including Atlas Haul Road), Roberts Creek Road, or Bypass Road. MMI would improve the existing North Roberts Creek Road to 60 feet in width, which would be consistent with the width of the Bypass Road and Roberts Creek Road. MMI would enter into a cooperative agreement with Eureka County for maintenance activities on this mine access route Roberts Creek Road. Mine-related traffic on Three Bars Road and Roberts Creek Road would be subject to seasonal timing restrictions from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. These restrictions do not apply to local or emergency traffic. Three Bars Road is a gravel road and is maintained for year-round access. MMI would enter into a cooperative agreement with Eureka County for maintenance activities on this mine access route.

Most of the mine haul roads would be designed for 100-ton rigid frame trucks. MMI may utilize 45-ton articulating trucks in limited areas where the haul roads from the pit areas are too narrow for 100-ton trucks to safely travel with two-way traffic. Haul roads would be constructed to BMPs and safety berms would be designed in accordance with MSHA requirements.

Internal mine roads would be approximately 30 feet in width and HLP access roads would be approximately 15 feet in width (**Figure 2.2-2**). The actual road disturbance width may be wider, depending on topography, to allow for cuts, fills and safety berms. MMI would control fugitive dust emission from roads using water or chemical dust suppressant application (such as magnesium chloride or lignin sulfonate), where appropriate.

2.2.3 Open Pits

Mining would occur in the existing Gold Pick and Gold Ridge pits and the proposed Cabin Creek Phase 2 (also known as Cabin Creek North) and Cabin Creek Phase 1 (also known as Cabin Creek South) pits (**Figure 2.2-1**). Conventional open pit mining methods (truck and shovel/loader) would be used to extract ore and waste rock. Rock would be drilled and blasted for excavation using ammonium nitrate (also known as prill) and fuel oil (ANFO) explosive mixture, or other appropriate blasting agents as determined by site-specific rock characteristics. Explosives would be stored and used in accordance with MSHA, the Bureau of Alcohol Tobacco and Firearms, and the Department of Homeland Security rules and regulations, as well as any and all other applicable federal, state, and local statutes and regulations regarding the transportation, storage, and handling of explosives. Blasting material would be kept in an explosive storage area (**Figure 2.2-1**). One blast per day is currently anticipated, and the total amount of explosives used would vary depending on the size of the working face of the pit(s). Blasting would be limited to once per day during the afternoon to ensure any blasting noise produced is outside of greater sage-grouse lekking hours and is after the time of day when inversions are likely to occur that could affect the propagation of blasting noise. The preliminary mine design consists of a single pit for each of the Gold Pick and Gold Ridge deposits and two pits in the Cabin Creek area. Approximate pit dimensions and stripping ratios are provided in **Table 2.2-2**.

Table 2.2-2 Approximate Pit Dimensions and Stripping Ratios

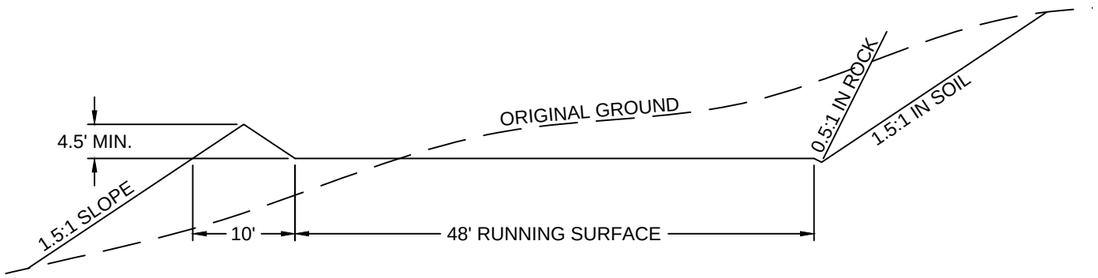
Pit	Width (feet)	Length (feet)	Depth (feet)	Volume (million cubic yards)	Pit Bottom Elevation (feet)	Stripping Ratio
Gold Pick	2,500	3,400	460	39.5	7,480	5.6
Gold Ridge	1,400	1,400	280	5.4	8,220	7.7
Cabin Creek Phase 2 Pit	450	550	120	0.4	7,300	1.4
Cabin Creek Phase 1 Pit	800	650	200	1.3	7,020	1.0

Pit Slope Stability

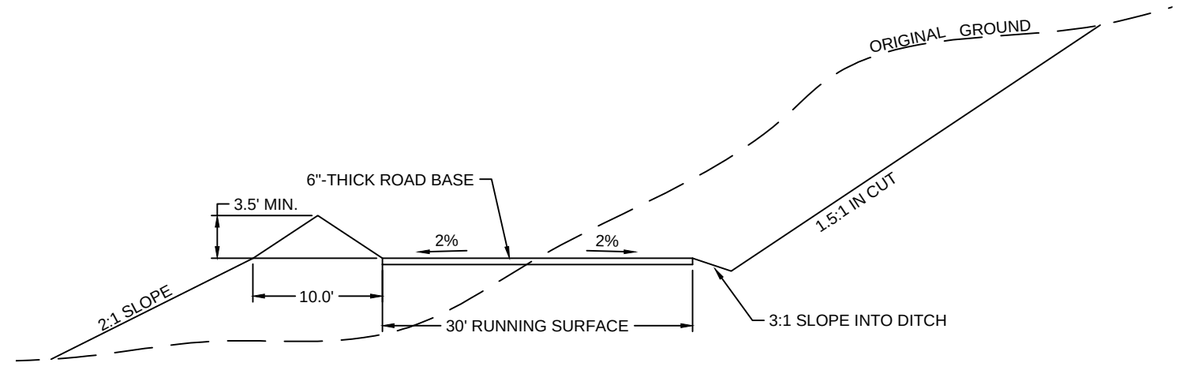
A geotechnical pit slope stability evaluation was completed to determine the maximum slope height, inter-ramp slope angle, bench face angle, and bench height for the proposed open pits. The results of the analyses are described in detail in the pit stability report (SRK, 2012a) in the Plan and summarized in **Table 2.2-3**. Cross sections showing typical slope angles for the Gold Pick, Cabin Creek, and Gold Ridge pits are shown on **Figures 2.2-3**, **2.2-4**, and **2.2-5**, respectively. Illustrations of the typical pit wall configurations are shown on **Figure 2.2-6**.

Table 2.2-3 Summary of Pit Slope Design Recommendations

Area	Max. Slope Height (feet)	Max. Inter-ramp Slope Angle (degrees)	Bench Face Angle (degrees)	Catch Bench Spacing (feet)	Catch Bench Width (feet)
Gold Pick	820	54	75	60	27
Gold Ridge	570	42	62	40	23
Cabin Creek Phase 2	490	54	75	60	27
Cabin Creek Phase 1	490	54	75	60	27



TYPICAL HAUL ROAD CROSS SECTION FOR 45 TON FLEET
NTS



TYPICAL SITE ACCESS ROAD CROSS SECTION
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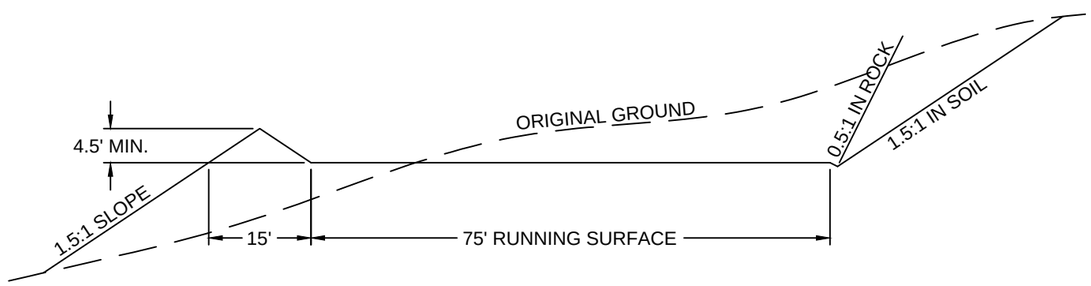

TYPICAL HAUL ROAD CROSS SECTION FOR 100 TON FLEET
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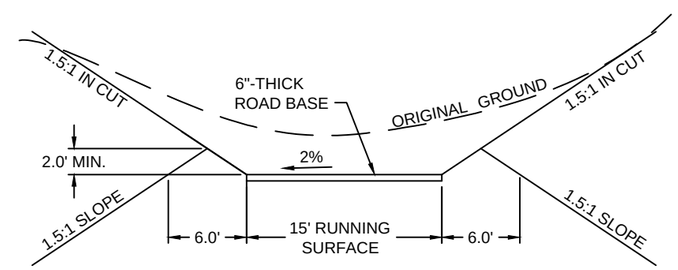

TYPICAL HEAP LEACH PAD ACCESS ROAD CROSS SECTION
NTS

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TYPICAL ACCESS ROAD AND HAUL ROAD CROSS SECTIONS

FIGURE 2.2-2

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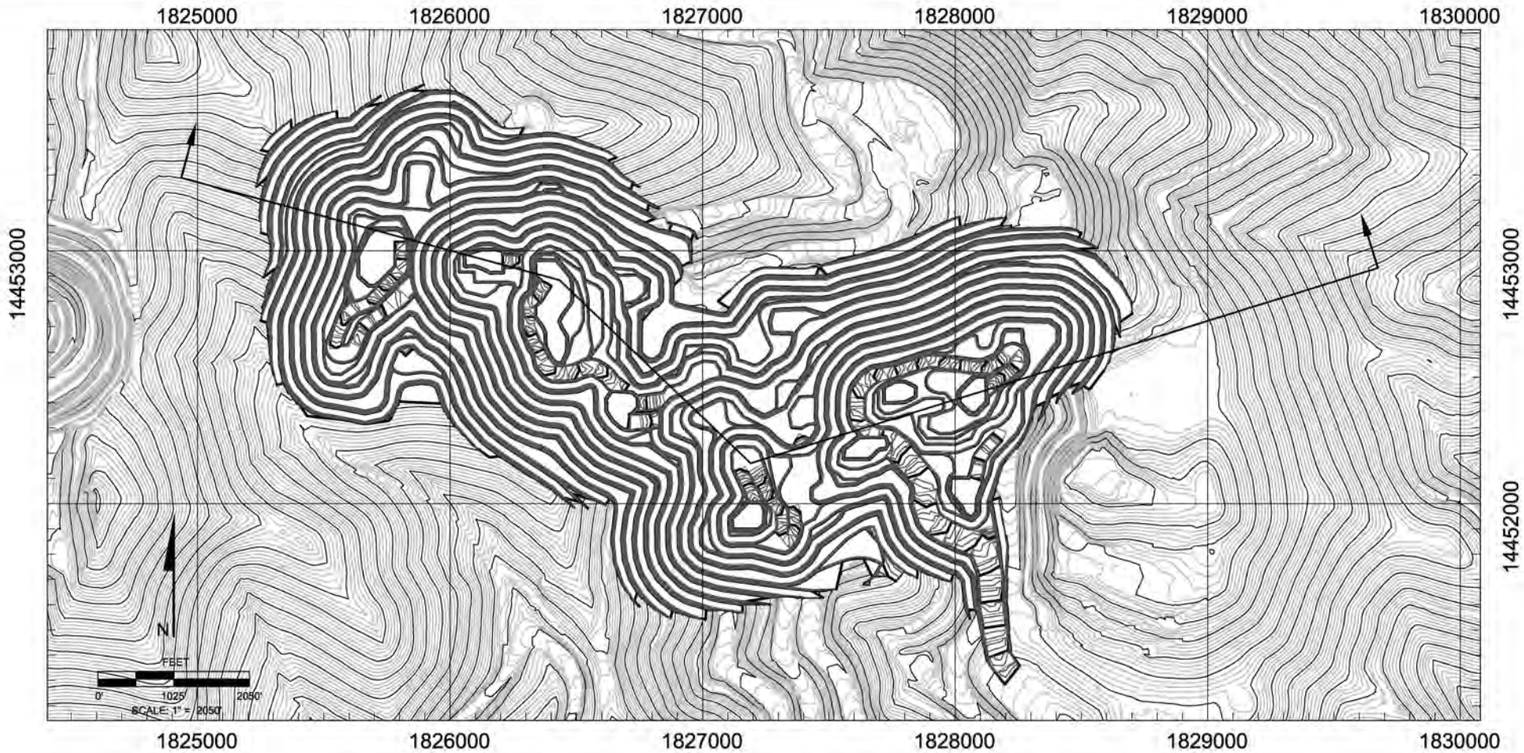

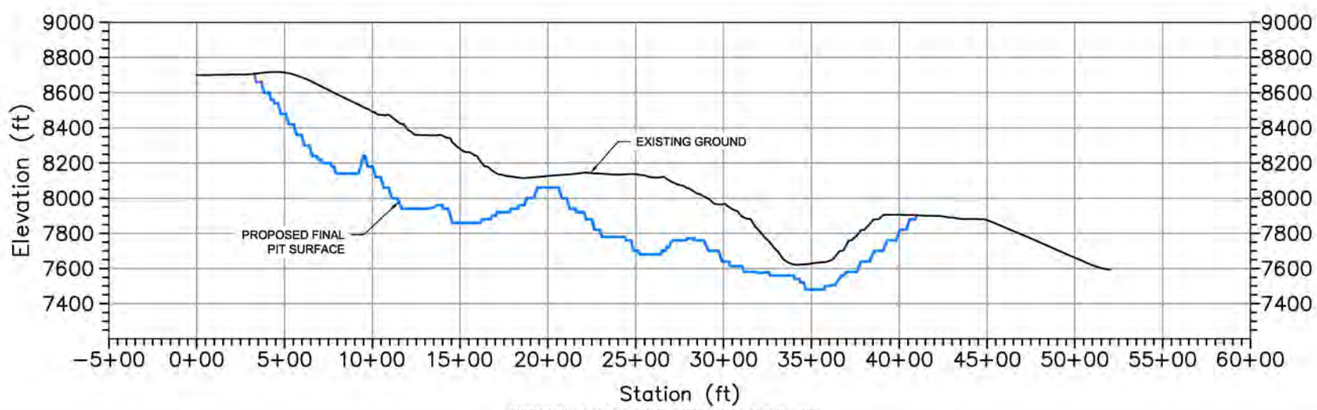

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TYPICAL CROSS SECTION OF THE GOLD PICK PIT

FIGURE 2.2-3

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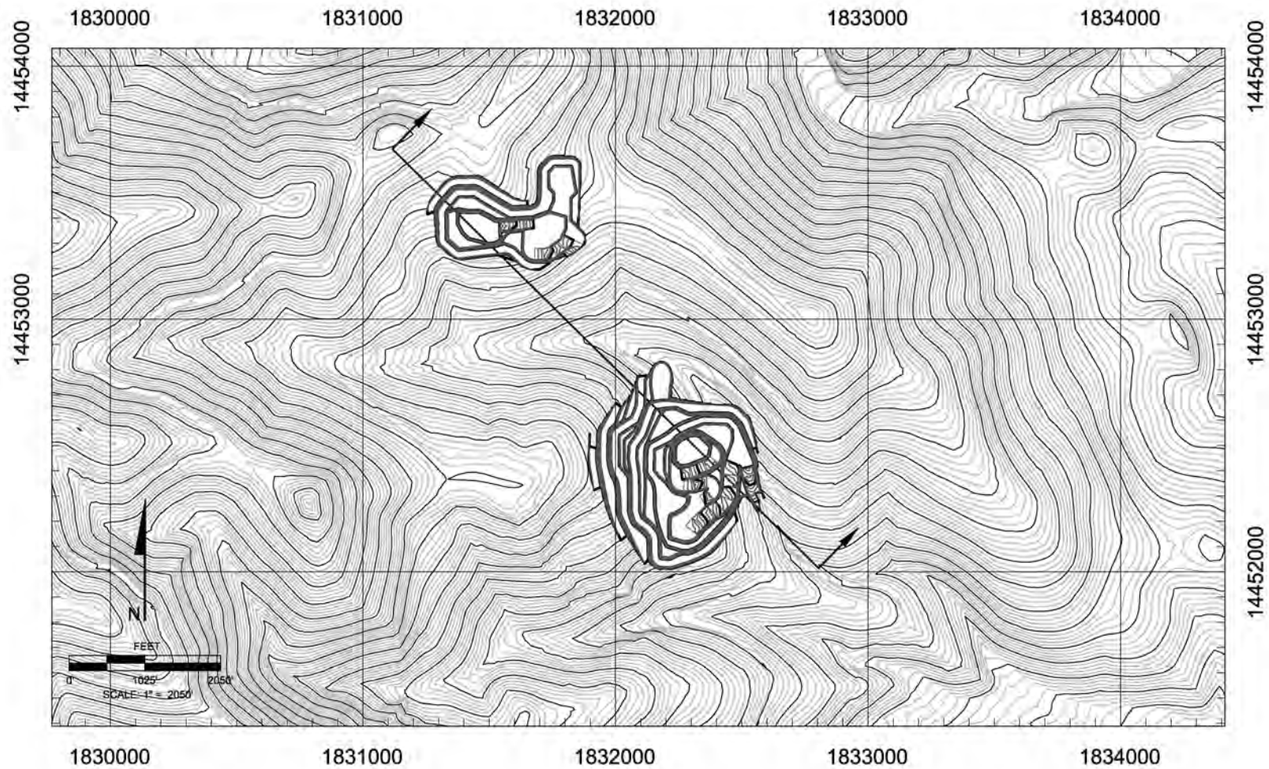

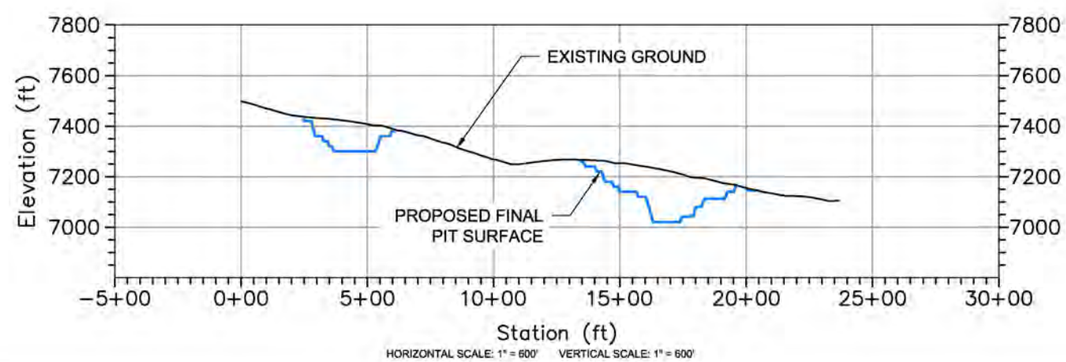

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TYPICAL CROSS SECTION OF THE CABIN CREEK PIT

FIGURE 2.2-4

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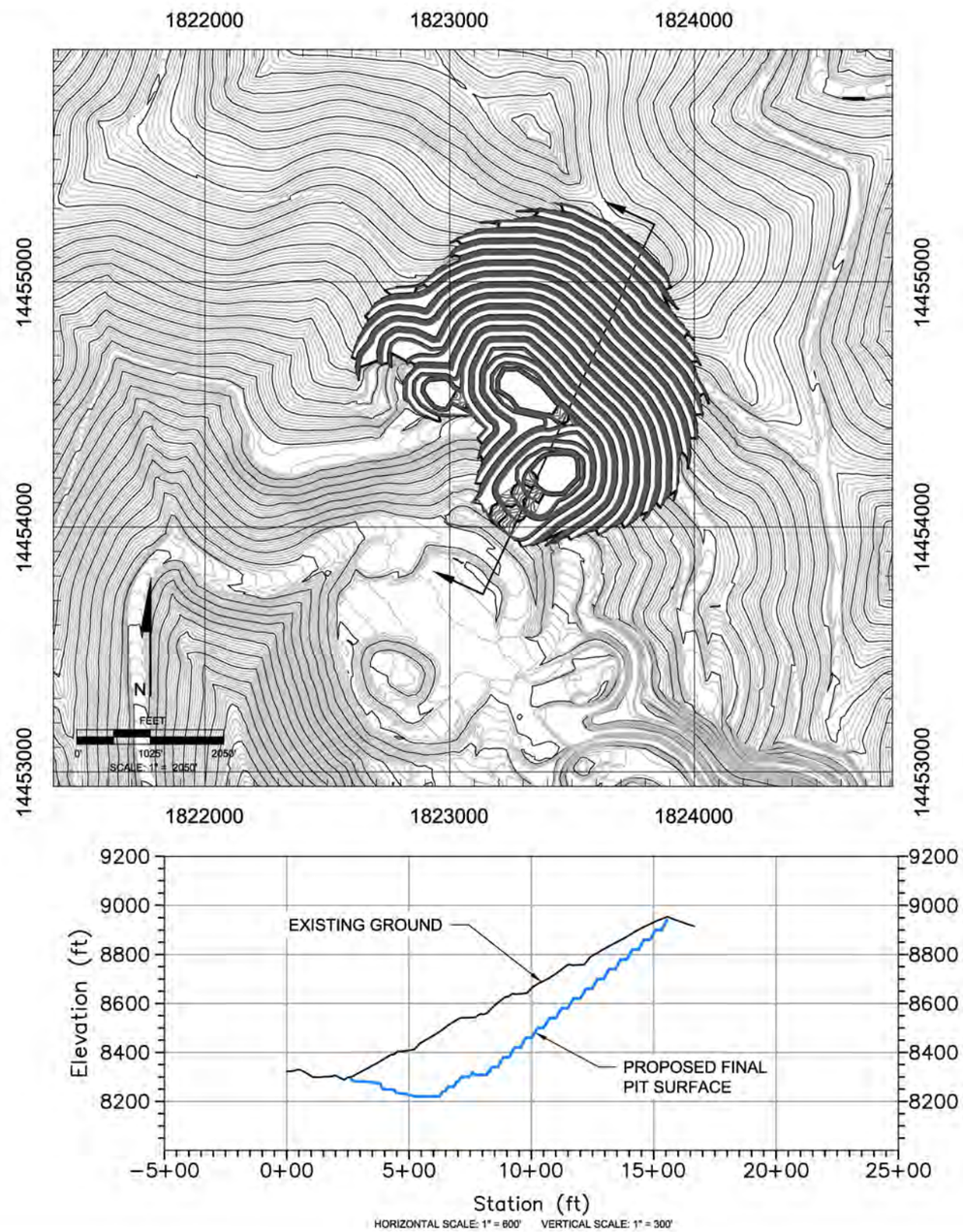

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TYPICAL CROSS SECTION OF THE GOLD RIDGE PIT

FIGURE 2.2-5

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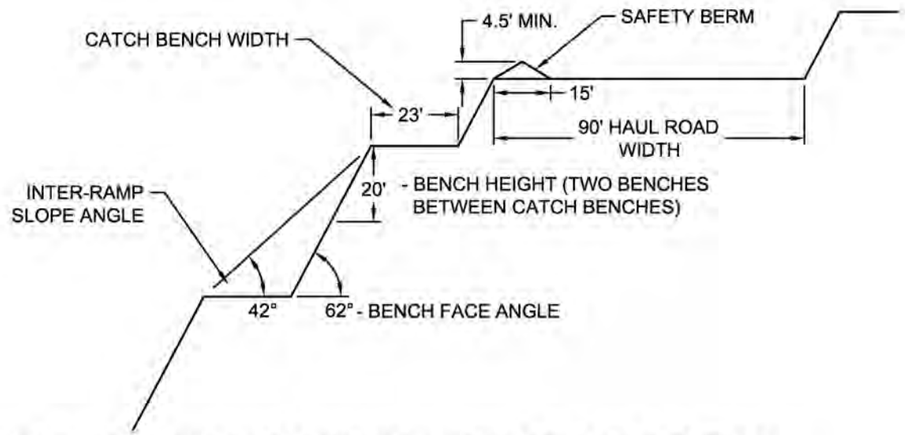

TYPICAL PIT WALL CONFIGURATION: RIDGE - 100 TON TRUCK ACCESS

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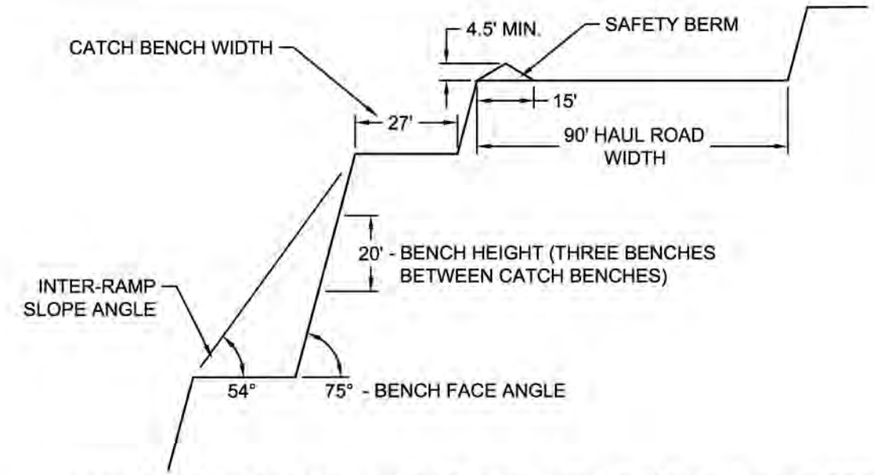

TYPICAL PIT WALL CONFIGURATION: PICK - 100 TON TRUCK ACCESS

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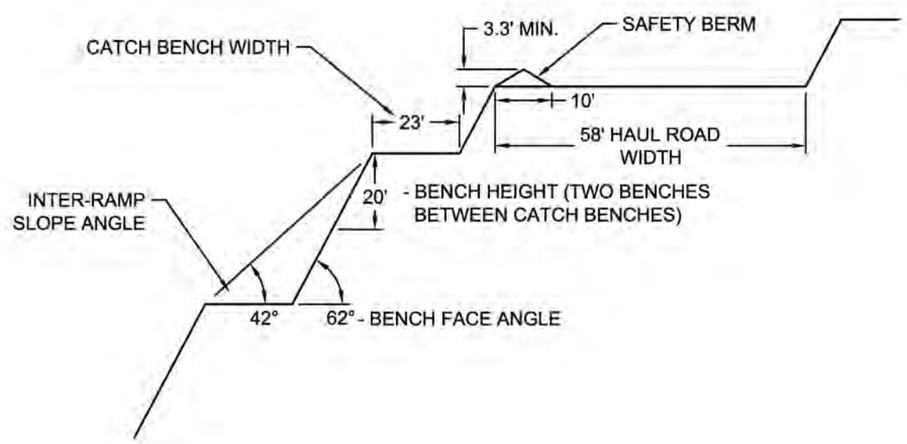

TYPICAL PIT WALL CONFIGURATION: RIDGE - 45 TON TRUCK ACCESS

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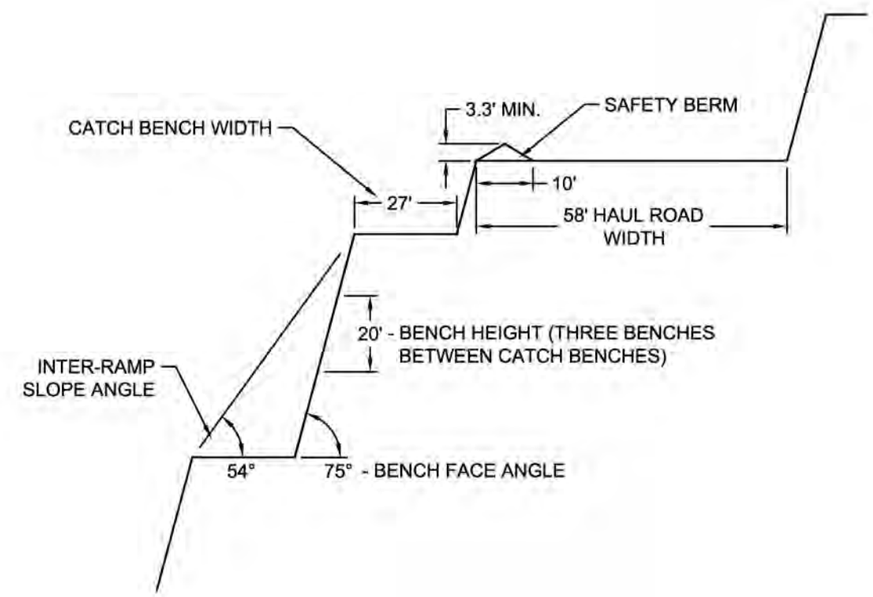

TYPICAL PIT WALL CONFIGURATION: PICK & CABIN - 45 TON TRUCK ACCESS

N.T.S

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TYPICAL PIT WALL CONFIGURATION

FIGURE 2.2-6

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Pit Dewatering Operations

Available drill hole data indicate that the proposed pit depths would not intercept groundwater and no groundwater inflows to the pits are anticipated during or after mining, as identified in **Table 2.2-4. Figure 2.2-7** provides detail on groundwater depth in relation to drill holes and monitoring wells. Groundwater has never been encountered during prior mining in these locations. Due to the high overall elevation of the proposed mining operation, and as supported by historic and recent exploration drilling, the Plan does not contain any provisions for pit dewatering. Similarly, geotechnical evaluations of pit slope stability have assumed all pits would be dry. MMI would further minimize inflows of surface waters to the open pits by managing and, where necessary, diverting surface water from each pits' catchment areas. Storm events may result in ephemeral accumulations of water in the pit bottoms. However, these are expected to be minimal and short-term, and no pit dewatering would be required during or following completion of pit reclamation activities.

Table 2.2-4 Anticipated Depth to Groundwater below Pit Bottoms

Pit	Anticipated Depth to Groundwater below Pit Bottom (feet)	Comment
Gold Ridge Pit	Minimum = 850	Constrained by negative data (no water encountered in deepest drill holes)
Gold Pick Pit	Minimum = 900	Constrained by exploration holes
Cabin Creek Phase 2 North	Minimum = 1000	Constrained by 2011 condemnation reverse circulation holes (dry to total depth)
Cabin Creek Phase 1 South	Minimum = 800	Constrained by 2011 condemnation reverse circulation holes (dry to total depth)

Pit Access

The Gold Pick pit area includes previously mined pits incorporated into the footprint of the proposed pit. These existing pits, combined with the steep terrain, make access to the pits challenging. As part of the pre-mining activities, access to the Gold Pick pit would be developed by constructing a series of roads on the north side and inside of the pit. Roads would be built using cut-and-fill construction. The Cabin Creek pits are in a previously undeveloped area. The initial section of road to the Cabin Creek pits would be built using fill material borrowed from the existing Pick WRDA. Once the fill road extends down to the existing WRDA, the road would be cut into the WRDA with dozers through the existing waste rock material. This road would eventually meet the natural grade. A temporary road would be built to get the haul trucks and support equipment to the Cabin Creek pits. The road would be widened to allow two-way traffic for the haul trucks and be covered with waste rock from the Cabin Creek pits to make an all-weather road surface. The Gold Ridge area would be accessed from existing haul roads. The previous operator had completed extensive development of the Gold Ridge deposit. These existing roads would be used to facilitate mining access to the Gold Ridge pit.

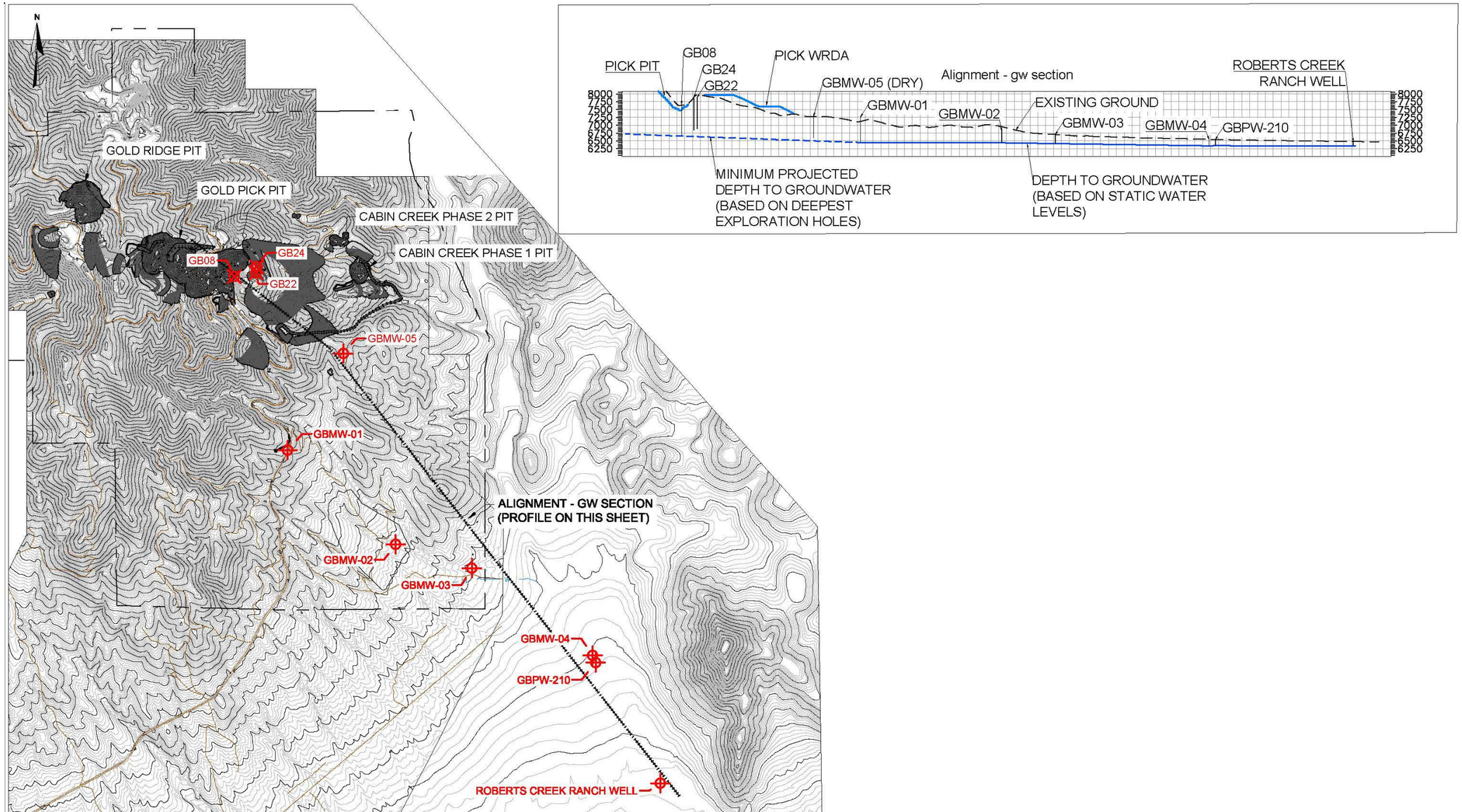
2.2.4 Waste Rock Disposal

Mining is anticipated to generate approximately 14.5 million tons (Mt) of waste rock annually (approximately 72.5 Mt total over life-of-mine [i.e., five years of active mining and leaching and two years of residual leaching]). Waste rock generated from the operation would be placed in WRDAs adjacent to the pits (**Figures 2.2-1** and **2.2-9**). WRDAs have been designed to have final side-slopes configured to match as closely as practicable the underlying natural topography. In most cases, waste rock would be placed over existing WRDA surfaces. A summary of basic design parameters and dimensions for the Project WRDAs is included in **Table 2.2-5** and a typical cross section of the WRDAs are illustrated on **Figure 2.2-8**. Waste rock is assumed to have a loose material density factor of about 95 pounds per cubic foot. Each WRDA was designed with a minimum of 10 percent additional volume to increase operational flexibility. Generally, end-dump methods would be used to place the waste rock at the WRDAs. Where possible, multi-bench dumps have been developed to allow for setbacks incorporated into each lift to produce an overall average slope ranging from 2H:1V (Horizontal:Vertical) to 3.8H:1V. A preliminary worst case stability analysis for the WRDAs was conducted at a slope angle of 2H:1V and is provided in the Slope Stability and Settlement Analyses as an appendix to the Plan (MMI, 2016a). The predicted stability of the critical cross sections satisfies the minimum recommended factors of safety established by the BMRR for both static and pseudostatic (earthquake) conditions (SRK, 2012a).

Table 2.2-5 Approximate Dimensions of the WRDAs

WRDA	Crest-to-Toe Height (feet)	Max Height Above Current 2015 Topo (feet)	Top Surface Elevation (feet)	Volume (tons)	As-built Slope (H:V)	Reclaimed Slope (H:V average)[1]
Pick West	475	140	8,700	2,533,000	1.5:1	4.4:1
Pick East Upper Access	575	95	8,220	1,943,000	1.5:1	3.8:1
Pick East Upper	650	343	7,970	35,841,000	1.5:1	3.8:1
Pick East Lower	280	240	7,500	9,920,000	1.5:1	3.8:1
Pick Jump Ramp	150	85	7,900	320,000	1.5:1	3.7:1
Pick South	420	175	7,840	4,464,000	1.5:1	3.0:1
Cabin Upper West	100	40	7,420	52,000	1.5:1	3.4:1
Cabin Upper East	150	60	7,345	350,000	1.5:1	3.5:1
Cabin Lower	270	115	7,300	1,523,000	1.5:1	7.9:1
Ridge Lower	570	145	8,305	5,420,000	1.5:1	2.6:1
Ridge Upper	400	345	8,655	7,447,100	1.5:1	3.1:1

[1] Benches would be graded to two percent minimum, and reclaimed WRDA intermediate lift slopes would range from 2:1 to 3:1. Overall average slope is calculated from WRDA crest to toe.



Source: MMI, 2017

Battle Mountain
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Mount Lewis Field Office

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GOLD BAR EIS PROJECT

0 1500 3000
FEET

N

DRILL HOLES USED TO DETERMINE MINIMUM GROUNDWATER DISTANCE

FIGURE 2.2-7

REVISION **A**

2/8/2017

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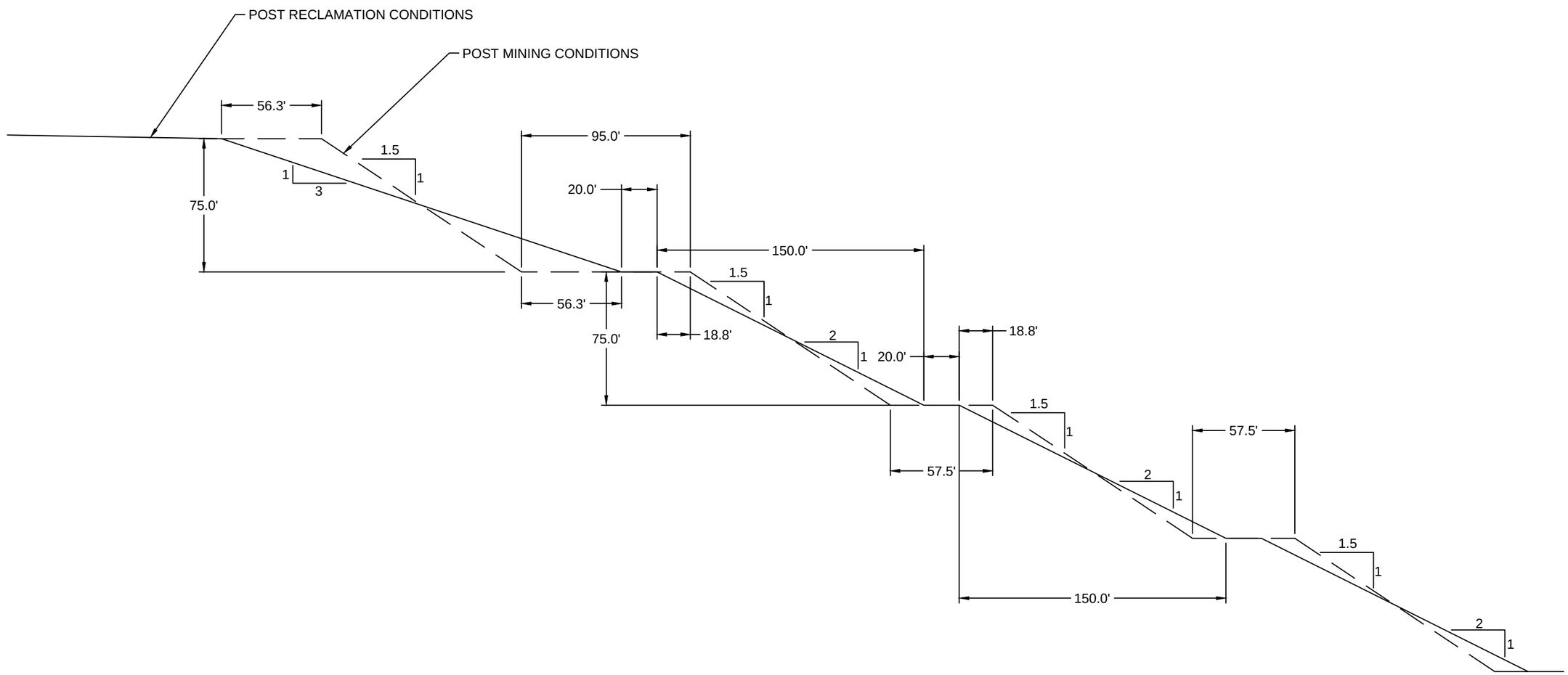

TYPICAL WASTE ROCK DUMP CROSS-SECTION

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NOT TO SCALE

TYPICAL CROSS SECTION OF WASTE ROC□ DISPOSAL AREA

FIGURE 2.2-□

1/1□/201□

REVISION **A**

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The majority of the waste rock generated during mining would be valley-fill Non-designated Waste, but the operation would also apply a pit backfill strategy where practicable. For example, the existing south pit at Gold Ridge may be backfilled with the waste rock from the upper benches of the new Gold Ridge Pit. There may be additional opportunities to backfill portions of the Pick and Cabin mining areas during operations. The current Plan does not include backfilling with pit material in the Pick Pit as the resource is still open in that mining area and the decision to do so would be made during operations if it proves economical. Cabin Phase 2 may require backfill material to be hauled in from Cabin Phase 1, if it is determined during operations that there would be surface water run-on issues for that pit (**Figure 2.2-9**). Waste rock would be placed by trucks and would be expected to contain a mixture of varying-sized material placed in lifts. Dozers would be used for final contouring of the material on the WRDAs. The final surfaces of the WRDAs would be constructed to create natural appearing topography. On sloped terrain, where safe and practicable, some weathered geologic materials may be pushed downhill below the growth media to construct toe berms and prevent rocks from scattering on the hillsides below the toes of the WRDAs. A Waste Rock Management Plan was prepared as part of the Plan (SRK, 2015a).

Waste Rock and Ore Geochemistry

A mine waste rock characterization program was conducted as part of the planning and impact assessment for the Project (SRK, 2014a). The characterization program was designed to investigate the potential for development of Acid Rock Drainage and Metal Leaching (ARDML) due to oxidation of sulfide minerals, such as pyrite, that are unstable under atmospheric conditions. Upon exposure to oxygen and water, sulfide minerals would oxidize, releasing metals, acidity, and sulfate. The geochemical characterization investigated the potential for rock that would be exposed in the Gold Bar WRDAs and heap leach facilities to generate acid and/or leach constituents when exposed to the atmosphere.

Samples used in the characterization program consisted of drill core from drilling activities completed for the exploration and geotechnical programs. A total of 84 sample intervals were selected from within the proposed pit boundaries to represent the range of waste rock and ore material types that would be encountered during mining and were classified according to alteration and oxidation. The resulting sample dataset is spatially representative of the main material types identified for the Gold Bar mining operations from the current Plan. In addition, eight samples representative of spent ore were collected from the metallurgical test work program to provide a prediction of long term heap solution chemistry.

The static test methods used for the characterization program included multi-element analysis using four-acid digestion and inductively coupled plasma and mass spectrometry analysis, Nevada Modified Sobek Acid Base Accounting (ABA), Net Acid Generation (NAG) test, and the Nevada Meteoric Water Mobility Procedure (MWMP). These static tests were selected to address total acid generation or neutralization potential of the samples and concentration of constituents in leachates derived from the material. However, these static tests do not consider the temporal variations that may occur in leachate chemistry as a result of long-term changes in oxidation, dissolution, and desorption reaction rates. To address these factors, kinetic testing was completed

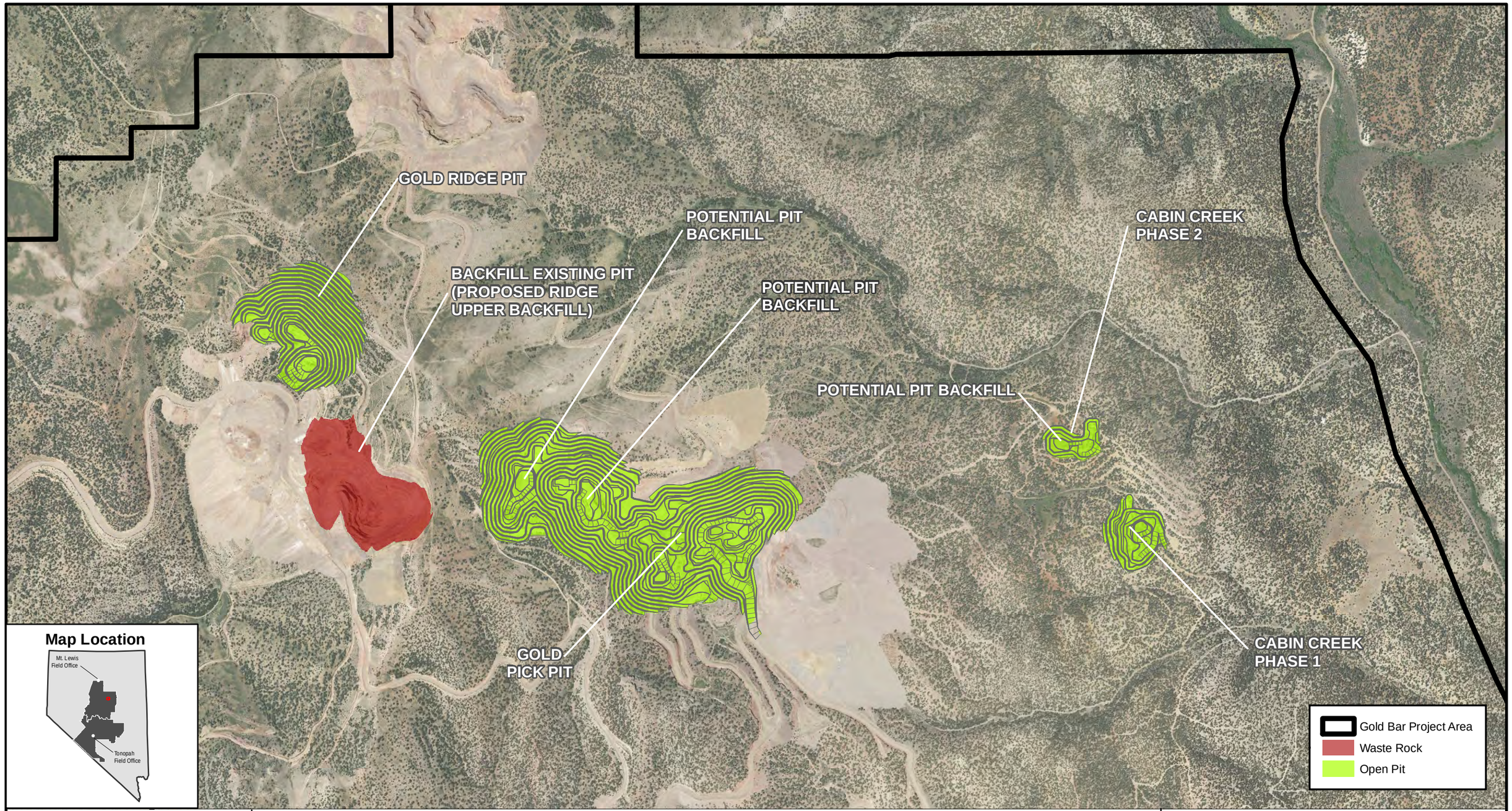
for eight representative humidity cell tests (HCTs) conducted according to the American Society for Testing and Materials D-5744-96 methodology.

The ABA data indicate the carbonate-rich sedimentary host rocks of the Gold Bar deposit contain significant neutralization capacity and limited sulfide mineral content with only two of the 84 samples classified as potentially acid generating (one sample of decalcified and carbonaceous ore and one sample of silicic limestone) from the ABA tests. Material types that contain significant sulfide sulfur (i.e., greater than 0.5 weight percent) include the decalcified and carbonaceous material that is unoxidized and typically ore grade. Despite the higher sulfide content, most of the decalcified and carbonaceous samples contain neutralization potential in excess of acid generation potential and are predicted to be net neutralizing. The exception to this is one sample of carbonaceous ore material with significant sulfide sulfur and lower neutralization potential that is classified as potentially acid generating. The acid generation potential of this sample was confirmed by the HCT program.

From the ABA data, the silicic limestone shows the lowest neutralizing capacity of all the material types; however, sulfide sulfur concentrations in these samples were also low and only one sample of silicic limestone shows an uncertain potential for acid generation. The remaining silicic limestone samples are classified as non-acid generating. The HCT program indicates this material type is essentially inert and does not have a potential to generate acid.

The argillic limestone is the main material type that would be encountered in the Gold Bar pits. The results of the ABA and NAG tests indicate this material type is acid neutralizing. Therefore, the bulk of the Gold Bar waste rock and ore material is likely to be net neutralizing and presents a low risk for acid generation. Although the excess of neutralizing capacity means that net acid conditions are unlikely to develop at Gold Bar, several constituents are likely to be mobile under the moderately alkaline conditions. The results of the MWMP and HCT tests showed arsenic, antimony, and thallium are consistently elevated under neutral to alkaline conditions. The greatest release of these constituents is seen for the ore grade samples due to the presence of orpiment (As_2S_3), realgar (As_4S_4), and stibnite (Sb_2S_3) associated with the gold mineralization. These minerals are generally not present in the waste grade material and as a result arsenic and antimony release is an order of magnitude lower for the waste rock samples.

The unoxidized limestone material types (i.e., carbonaceous and decalcified limestone) exhibited the highest risk of metal leaching under both acidic and alkaline conditions. The carbonaceous ore material containing sulfides and limited neutralization potential was the only material type predicted to generate acid from the static and kinetic test results. This material type showed a potential to leach aluminum, antimony, arsenic, beryllium, cadmium, chromium, fluoride, iron, lead, magnesium, manganese and nickel, sulfate, and thallium above NDEP reference values under low pH conditions. Significant metalloid (e.g., arsenic) leaching under high pH conditions was also observed for the unoxidized decalcified material. Based on these results, the oxidation state of the material can be used to predict the geochemical behavior of the Gold Bar material and special handling and management of the unoxidized limestone material types (i.e., carbonaceous and decalcified limestone) is recommended for the Project.



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Mount Lewis Field Office

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0 1,000 2,000 Feet
1 in = 1,000 feet

N

PIT BACKFILL LOCATIONS

FIGURE 2.2-9

REVISION **A**

1/31/2017

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From an ore processing perspective, the sulfide bearing decalcified and carbonaceous material is considered preg-robbing (removes cyanide from solution) and it is not amenable to standard heap leach extraction. Therefore, the unoxidized ore material would be managed as waste rock during operations and would report to the WRDAs. According to the geologic block model, the unoxidized decalcified and carbonaceous limestone material types (waste and ore-grade) comprises about 10 percent of the total waste rock that would be mined from the Gold Pick pit and a minor amount of the waste rock from the Cabin Creek pits (i.e., less than one percent). None of the waste rock from the Gold Ridge Pit would consist of unoxidized limestone.

Waste rock from the Project can be separated into the following two waste rock management classes based on material type:

- Non-Designated Waste; and
- Designated Waste.

Designated Waste is defined as waste rock that demonstrates a potential to generate acid with a potential for metal release or is net neutralizing with a potential for metalloid release. All material types that do not fall within this classification are termed Non-Designated Waste.

Material types that have been classified as Designated Waste include the unoxidized carbonaceous limestone and decalcified limestone. Since this type of unoxidized ore would be managed as waste rock and placed on the WRDAs, the Designated Waste classification applies to both the waste grade and ore grade carbonaceous and decalcified limestone material. The term ‘Designated Waste’ is being used instead of the more commonly used ‘Potential Acid Generating Waste’ due to the component of the unoxidized carbonaceous limestone and decalcified limestone material that is net neutralizing but requires management due to the potential for metalloid release in circumnetural to moderately alkaline conditions (SRK, 2015a). The spent ore samples included in the study consisted entirely of oxidized material. The sulfide-bearing carbonaceous ore was not included in the metallurgical test columns because this material would not be placed on the heap leach facility. Geochemical results indicate the oxide spent (leached) ore material contains significant neutralizing capacity and is predicted to be non-acid generating from both the ABA and NAG results. The potential for metal leaching from the spent ore material is also low with the exception of arsenic, antimony, mercury, and thallium that are elevated under alkaline conditions. These constituents are predicted to be elevated in the long-term heap drain down solution from the Gold Bar heap leach facility (MMI, 2016a). Waste rock that would be mined from the Gold Bar pits would consist primarily of Non-Designated Waste material (i.e., greater than 94 percent), with six percent of the total waste rock being considered designated waste (SRK, 2015a).

Designated Waste, which is generated entirely from the Pick Pit, would be stored in a repository, within the WRDA, immediately southeast of that pit. The Designated Waste repository would be constructed within the Pick East Lower WRDA (**Figure 2.2-1**). The Designated Waste, which is mined mainly in the final year of production, would be stacked along the toe of the Pick East Upper

WRDA. As this waste is being placed, non-designated waste material would be stacked to the outside of the designated waste in order to buttress as well as encapsulate it.

Stormwater would be managed in the area via localized grading and berm or channel construction as necessary to ensure water contacting the Designated Waste is not allowed to run off. During closure and reclamation, non-designated waste from the Pick East Upper WRDA would be dozer pushed and compacted via equipment traffic over the repository and graded to drain away from the area. The thickness of this initial non-designated waste rock layer would vary, but would generally be a minimum of five feet thick. A 12-inch-thick layer of clay rich or bentonite-amended fined-grained waste rock or alluvium would be placed and compacted over the initial lift of non-designated waste rock. If required, bentonite would be thoroughly blended into the loose soil prior to compaction at a rate of not less than four percent by weight. An additional five-foot-thick layer of non-designated waste rock would then be placed and compacted with equipment traffic over the bentonite-amended layer to protect it from the potential effects of freeze-thaw cycles and root penetration.

2.2.5 Ore Handling

MMI plans to process approximately 2.8 Mt of ore per year at the Project. The configuration of the proposed process facilities is depicted on **Figure 2.2-1** and **Figure 2.2-10**. Mined ore would be transported by truck and stockpiled at the crusher facility. If any ore is determined to be suitable for direct placement and heap leaching as run-of-mine it would be treated with lime in the truck load prior to placement. Lime would be added at a rate of 3.0 lbs of hydrated lime per ton of run-of-mine ore from a storage silo and feeding unit located near the heap leach pad. The ore would be picked up by a loader and fed to a jaw crusher, where it would be crushed to a size 80 percent passing four inches. Crushed material would then be conveyed to a screen where screen undersize material would be treated with cement and fed to an agglomeration drum. Oversize material would bypass the agglomeration drum. The oversize and agglomerated material would be recombined and transferred on to the HLP via a heap conveyor stacking system. Ore would be stacked on the heap by a series of portable grasshopper conveyors followed by an indexing conveyor and radial stacker. Stacked ore would then be leached on the HLP with a weak cyanide solution to extract the contained gold. Leach solution applied to the top of the heap is called barren solution and gold-bearing leach solution draining from the bottom of the heap is called pregnant solution. Gold would be recovered from the pregnant leach solution (PLS) in an ADR plant by adsorbing the extracted gold onto activated carbon followed by desorption into an upgraded and purified gold-bearing solution, electrowinning, and final pouring of a doré via a melting furnace. The leach solution after the gold is removed (barren solution) would be rejuvenated with reagents as required to elevate the pH and maintain the dissolved cyanide concentration before being pumped back to the HLP and applied to the top of the heap.

2.2.6 Heap Leaching

The dedicated HLP, barren and pregnant solution tanks, process solution pond, and ancillary facilities are designed to accommodate a leachable reserve of approximately 17.3 Mt of ore from the Gold Pick, Gold Ridge, and Cabin Creek open pits.

GROWTH MEDIA STOCKPILE
TRUCK SHOP
50,000 GALLON RAW WATER / POTABLE WATER TANK
UPPER FUEL STATION
SEDIMENT BASIN
ROM STOCKPILE
CRUSHER
CONVEYOR
PERIMETER FENCE
PERIMETER ACCESS ROAD WITH CHANNEL
PHASE 1A BOUNDARY
SCREENING AREA ACCESS ROAD
POWER LINE
SCREENING AND AGGLOMERATION AREA
GROWTH MEDIA STOCKPILE
EVENT POND
PROCESS AREA ENTRANCE ROAD
500,000 GALLON RAW / FIRE WATER TANK
POTABLE WATER TANK
WAREHOUSE/MAINTENANCE SHOP
ADMINISTRATION BUILDING
PROCESS SOLUTION POND
LABORATORY
WAREHOUSE / MAINTENANCE SHOP STORAGE AREA
ADR PLANT
GENERATOR PLANT
LNG STORAGE
LOWER FUEL STATION
PROJECT BOUNDARY
7000
7050
7100
7075
7025
6975
6950
6900
6850
3.0:1
7%
8%

Map Location

Mt. Lewis Field Office
Tonopah Field Office

Battle Mountain
BLM District
Mount Lewis Field Office

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GOLD BAR EIS PROJECT

0 600 1,200 Feet
1" = 600 feet

N

HEAP LEACH PAD AND POND CONFIGURATION

FIGURE 2.2-10

REVISION **A**

1/19/2017

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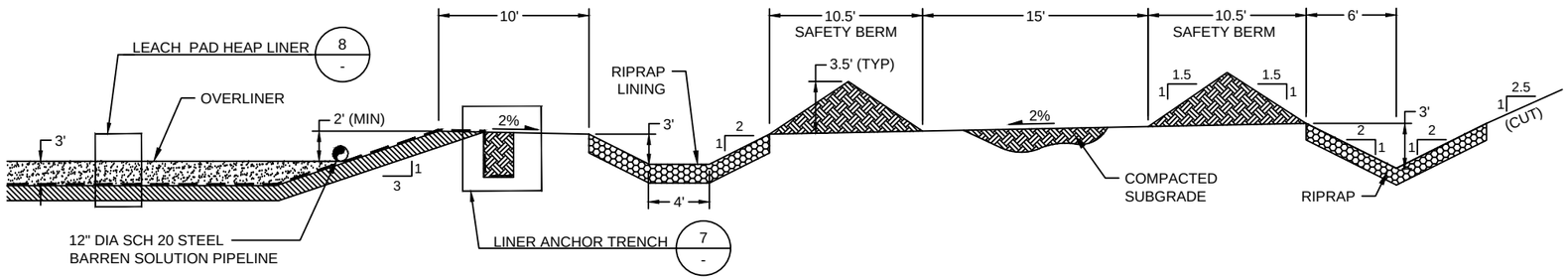
The proposed Gold Bar HLP would be built in two phases, Phase 1A and Phase 1B, and would be located in an area of moderately undulating topography between two natural drainages (**Figure 2.2-1** and **Figure 2.2-10)**. The HLP would extend in a southeast-to-northwest direction from an elevation of 6,750 feet above mean sea level (amsl) to an elevation of 6,985 feet amsl. As identified in **Table 2.2-6**, the HLP would have a total lined area of approximately 3,933,600 square feet and a total ore capacity of approximately 14,082,000 cubic yards.

The HLP would be constructed in accordance with Nevada regulations, NAC 445A.432-445A.438. The HLP liner system would consist of a compacted low permeability soil layer (secondary liner) overlain by a single synthetic primary liner. The primary liner would be an 80-mil High Density Polyethylene (HDPE) geomembrane liner and the underlying secondary liner would consist of one foot (12 inches) of a bentonite-soil admixture with a hydraulic conductivity of 1×10^{-6} centimeter per second (cm/sec) (or approximately 3.9×10^{-7} inches per second) or less. The low-permeability, secondary liner layer would be constructed in place by excavating to a minimum depth of one foot, mixing the excavated soil with bentonite at the designated ratio, moisture conditioning, then compacting the mixture to a finished base grade. Alternatively, local clay borrow sources in the Cabin Creek Pit area would be borrowed for construction of the low-permeability, secondary liner layer. The finished surface of this prepared sub-liner layer would then be overlain by the primary liner and overliner material. A uniform, permeable overliner layer consisting of three feet of crushed and screened rock or ore would be placed over the primary liner to protect it from punctures and provide a drainage layer under the ore. The overliner layer would also minimize hydraulic head on the liner during operations by promoting rapid conveyance of fluids. The overliner layer would include a network of perforated pipes to collect solution and direct it to the main solution pipes delivering solution to the pregnant solution tanks in the ADR plant. The HDPE liner would be installed in a manner that would prevent structural damage to the liner during ore placement. **Figure 2.2-11** presents a typical liner design. General HLP cross sections are presented on **Figure 2.2-12**. The HLP dimensions are summarized in **Table 2.2-6**.

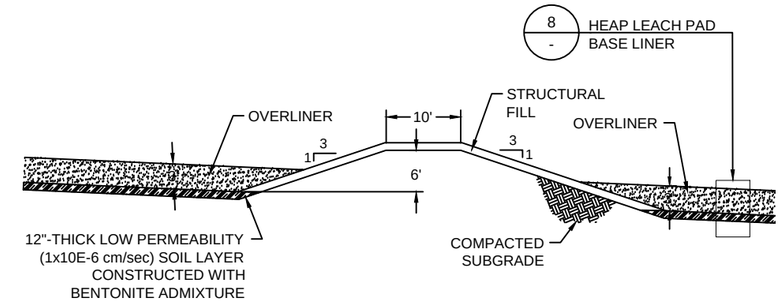
Table 2.2-6 Summary of Heap Leach Pad Dimensions

Heap Phase	Maximum Width* (feet)	Minimum Width* (feet)	Maximum Length* (feet)	Minimum Length* (feet)	Maximum Lift Height (feet)	Maximum Heap Height above Liner (feet)	Maximum Elevation (feet amsl)	Lined Area (square feet)	Net Ore Capacity (cubic yards)
Phase 1A	1,760	1,470	1,860	1,450	26	179	7,064	2,684,900	8,805,000
Phase 1B	1,248	890	1,060	850	26	192	7,110	1,248,700	5,277,000
Total Lined Area									**3,933,600**
Total Ore Capacity									**14,082,000**

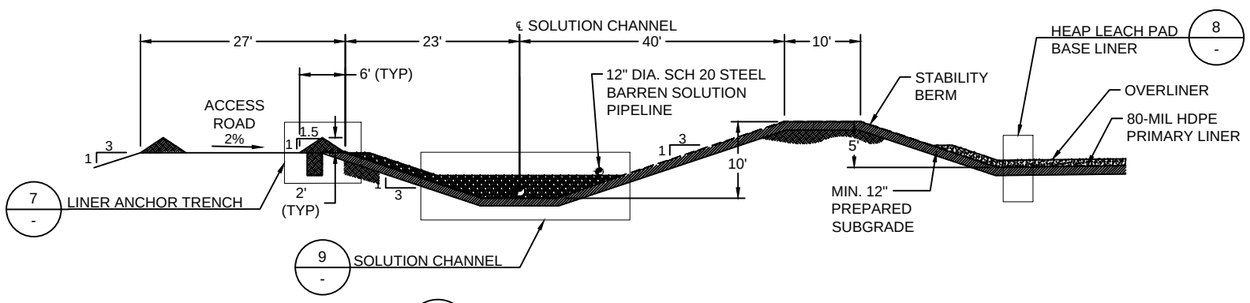
*The heap is not symmetrical so dimensions can vary widely.



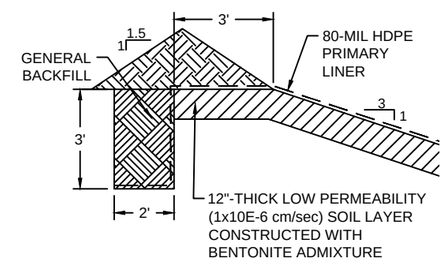
4 - **PERIMETER ACCESS ROAD IN CUT (TYP)**



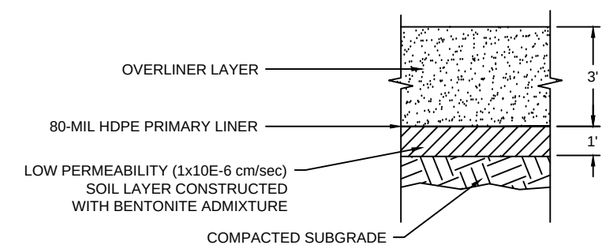
5 - **PHASE DIVIDER BERM**



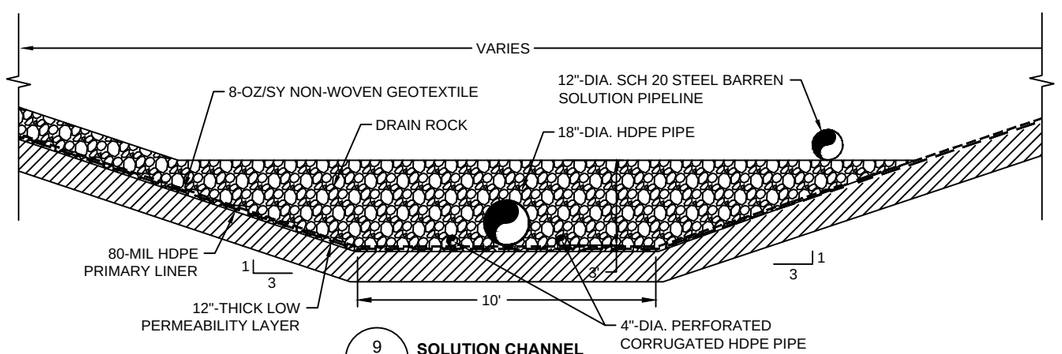
6 - **STABILITY BERM AND SOLUTION CHANNEL (TYP)**



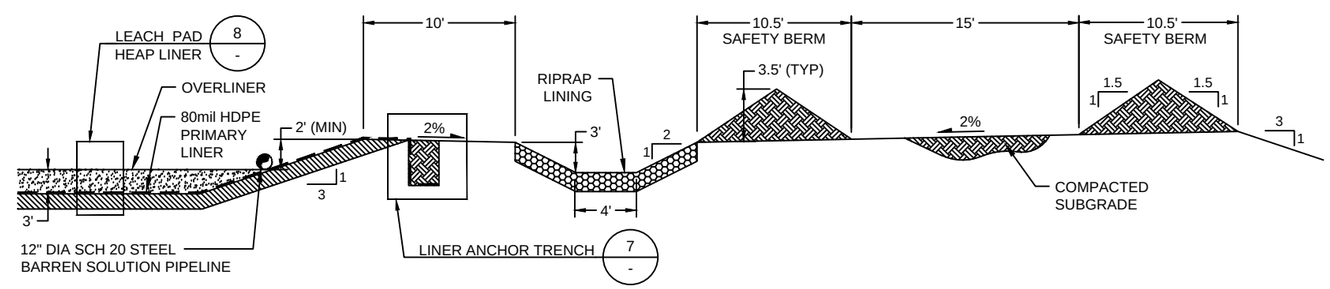
7 - **LINER ANCHOR TRENCH (TYP)**



8 - **HEAP LEACH PAD BASE LINER**



9 - **SOLUTION CHANNEL**



10 - **PERIMETER ACCESS ROAD IN FILL (TYP)**

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NOT TO SCALE

DRAWING TITLE:
HEAP LEACH LINER DESIGN AND DETAILS

DRAWING NO.: **FIGURE 2.2-11**

REVISION NO. **A**

DATE **1/1/201**

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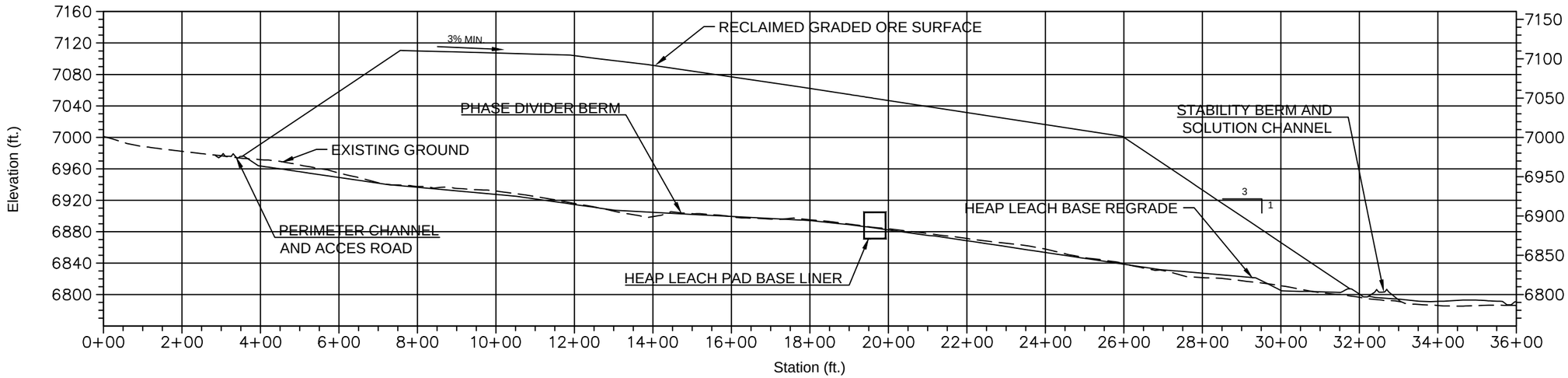
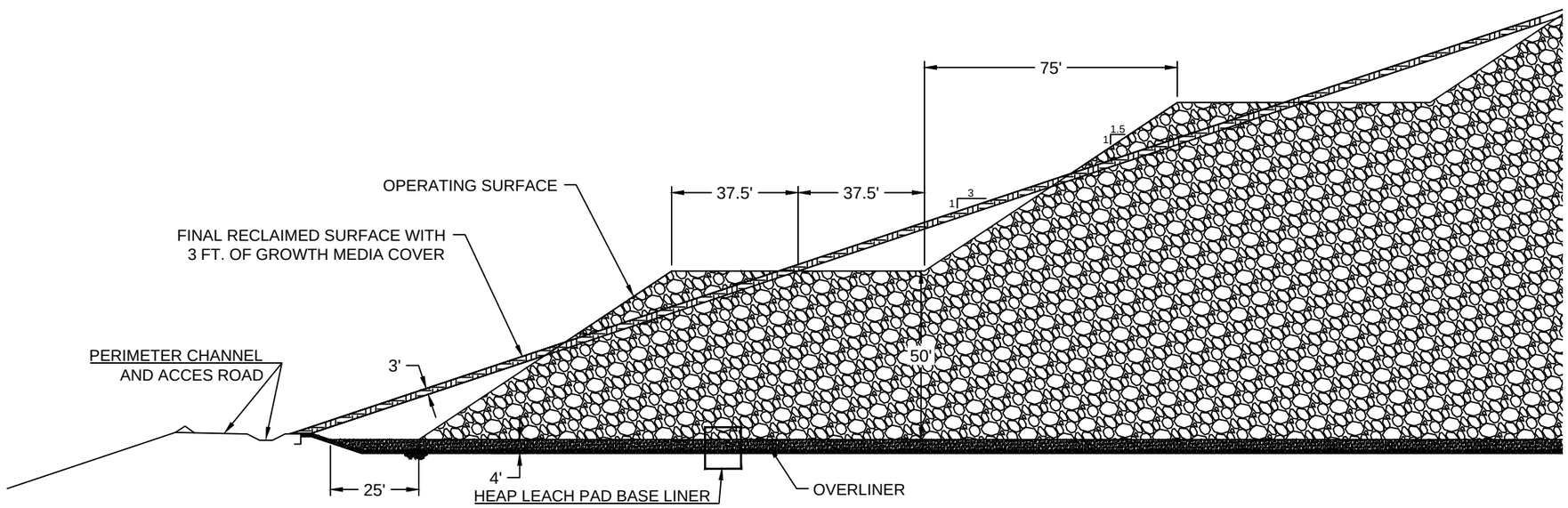


FINAL ORE GRADING - POST RECLAMATION

HORIZONTAL SCALE 1" = 300'

VERTICAL SCALE 1" = 150'



TYPICAL ORE HEAP SECTION

NOT TO SCALE

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HEAP LEACH PAD CROSS SECTIONS

FIGURE 2.2-12

REVISION **B**

1/1□/201□

N□ □rr□□□ □□ □ □d□ □□ □□□ B□r□□□ □□L□□d M□□□□□□ □□□□□ □□ □□□ □cc□r□c□□r□□□□□□□□□□r c□□ □□□□□□□□□ □□□□□□□ d□□□ □□r □□d□□d□□□□□□ □r □□□r□□□□□ □□□ □ □□□ □□□□r d□□□.

Construction

Construction of the HLP is planned for two phases. The first phase (Phase IA) would have the capacity to contain approximately 8.8 million cubic yards of crushed and agglomerated ore, and the second phase (Phase IB) would have the capacity to contain approximately 5.3 million cubic yards of crushed and agglomerated ore for a total of approximately 14,082,000 million cubic yards. HLP construction would include foundation preparation, liner system installation, PLS collection piping system installation, and placement of overliner material. During construction, a Quality Assurance/Quality Control team would be present to monitor secondary liner preparation and HDPE liner installation to document that the liner system is installed properly and to make sure any damage to the HDPE geomembrane is repaired prior to covering with overliner. Standard quality assurance and control consistent with NAC 445A.439 would be conducted to identify, prevent, and/or repair geomembrane liner punctures or welding defects along the liner seams during construction.

Heap Leach Pad Stability Analysis

Slope stability and seismic hazard analyses were completed for the HLP design configuration using Probabilistic Seismic Hazard Analysis and the computer program SLIDE. The analyses and results provided in the Plan demonstrate that the proposed HLP would be stable under both static and pseudostatic conditions for both the Phase 1 and Final Ore Grading configurations (SRK, 2015b).

Heap Leach Pad Solution Recovery System

The PLS collection and recovery system would consist of a network of collection pipes designed to gravity drain PLS to tanks in the ADR plant area. HDPE pipes from the PLS solution recovery system would be placed in ditches that are lined with 80-mil HDPE to serve as secondary containment. The HDPE lined ditches from the HLP to the process building would be backfilled with gravel and the HDPE lined ditches between the process solution pond and the ADR plant would not be backfilled during operations. Piping associated with the process solution pond would be contained within a system of lined berms surrounding the pond.

Heap Leach Pad Stormwater Diversions

The HLP would require the construction of up-gradient stormwater controls to divert potential drainage of stormwater around the HLP. This would be accomplished through triangular channels (v-ditches) constructed adjacent to the upstream side of the HLP perimeter berm. Both Phase-1A and Phase-1B perimeter berms would have triangular channels upstream to divert the 100-year, 24-hour peak flow around the HLP. A hydrologic analysis of the watersheds up-gradient of the HLP was performed using the proposed site design with HEC-HMS software developed by the U.S. Army Corps of Engineers. The U.S. Department of Agriculture WinTR-55 methodology was used to calculate the 100-year, 24-hour peak flow rates for the channels. Triangular channels with a depth of three feet and 2H:1V sideslopes are proposed to convey the 100-year peak flow rates from upstream watersheds. A three-foot deep triangular channel has the capacity to convey 90 cfs which is adequate to manage the 100-year peak flow rates for Phase-1A and Phase-1B of 17 and 19 cfs respectively. The channels will be lined with a one-foot-thick layer of riprap with a

median size (D50) of six inches based on the Federal Highway Administration Hydraulic Engineering Circular No. 15 method (MMI, 2016a).

Heap Leach Pad Stormwater Control

During HLP operations, precipitation falling directly onto the HLP would be managed by the solution collection and recovery system in the same manner as the applied process solution. Stormwater that does not infiltrate into the heap would be handled by the perimeter channel formed between the toe of the HLP and the perimeter berm, which is specified as a minimum of two feet deep. At the low point, stormwater would enter the lined solution channel by overflow through four lined “notches” in the stability/solution containment berm and flow to the event pond. Stormwater runoff from the growth media surface over the final, post-reclamation configuration of the heap would be managed by a three-foot-deep trapezoidal channel around the perimeter of the leach pad between the heap and the perimeter access road. This channel would be constructed during initial leach pad construction and grading. At the low point, stormwater would enter the lined solution channel by overflow through four lined “notches” in the stability/solution containment berm and flow to the event pond.

Heap Leach Pad Solution Channel System

Under normal operations, barren solution would report from the carbon columns to the barren tank located within the ADR plant where reagents are added and the solution is pumped to the leach pad. The main barren solution pump is also contained within the ADR plant. All piping not inside of containment (i.e. not over pond or heap leach pad liner, inside concrete containment or inside the leach pad perimeter berm) would be placed inside a geomembrane-lined ditch or installed inside a secondary pipe to satisfy the requirements of NAC 445A.436.

Solution from the main barren pump would be conveyed to and around the base of the leach pad in a 12-inch diameter steel solution delivery pipe. The solution delivery pipe would run inside the leach pad perimeter berm at the toe of the ore slope. The berm would be lined to the inside crest in order to provide containment in the event of a pipe break or a storm event. The space between the toe of the ore and perimeter berm would form a two-foot-deep channel to convey draindown, stormwater and pregnant solution (in the event of a pipe breach) to the event pond. The solution pipe would have tees at 500-foot intervals with HDPE “takeoffs” for solution delivery to the top of the heap. Each takeoff would be valved and the main solution line would have valves at minimum intervals of 2,000 feet. The solution delivery pipes would connect to smaller feeder pipes feeding one half inch-diameter drip lines spaced on 30-inch centers with drip emitters every 30 inches.

After passing through the ore, pregnant solution would be collected by a network of perforated collection piping located at the base of the pad. The perforated piping would consist of four-inch diameter perforated, corrugated HDPE on 30-foot centers with 12-inch diameter collector pipes on the downhill edges and center of each cell. The proposed leach pad would be divided into discrete cells with a three-foot high divider berm between each cell.

Solution would be conveyed to the lowest corner of each cell in perforated pipes that would connect to a solid pipe for conveyance to the primary solution collection line running along the

east, west and south edges of the leach pad. The main conveyance pipeline would consist of an 18-inch diameter corrugated, smooth internal wall HDPE pipe that would sit at the inside toe of the perimeter berm and would be covered with overliner for thermal stability. The 18-inch pipe would carry solution to the pregnant tanks located near the edge of the process solution pond in an HDPE-lined trapezoidal channel connecting the leach pad to the ponds. This channel would have the same lining system as the leach pad.

Solution would be pumped from the pregnant tanks to the carbon columns in the ADR plant. A channel would connect the process solution pond to the event pond to maximize containment (MMI, 2015b and 2016b).

The solution channel includes two, four-inch-diameter perforated corrugated pipes to accelerate drainage of fluids entrained in the channel drain rock and minimize hydraulic head development (i.e., to less than one foot under normal operating conditions) over the composite liner system. The effectiveness of these overliner drainage pipes would govern the potential for development of hydraulic head above the liner.

MMI would install two standpipe piezometers in the solution channel drain rock to measure the head above the synthetic liner in the solution channel (SCP-01 and SCP-02). These would be measured monthly under normal operating conditions and any trends showing greater than one foot of head would be addressed by installing additional perforated drainage piping above the liner to increase system permeability and reduce head trends.

Process Solution Pond and Event Pond

The process solution pond would hold weak cyanide solution collected from the heap, contain overflow from the pregnant and barren solution tanks, and provide make-up water to the barren or pregnant solution systems. Solutions to and from the process solution pond would be contained in HDPE pipes; the pipes would be placed within 80-mil HDPE lined ditches or berms for secondary containment. Secondary containment is described in the Water Pollution Control Permit (WPCP) (Volume 5, Appendix B.2) (MMI, 2016b). The process solution pond would be sized to accommodate operating and stormwater volumes in accordance with the requirements of design criteria under NAC 445A.433 and 445A.435. The process solution pond would be double geomembrane-lined with an integrated Leak Collection and Recovery System (LCRS). Similarly, an event pond would be sized to accommodate the design storm in accordance with NAC 445A.433 and 445A.435. Water balance calculations and a description of the assumptions that went into developing them are included in WPCP (Appendix I) (MMI, 2016b). The layout of the process and event ponds is shown on **Figure 2.2-1** and **Figure 2.2-10**. Design parameters of the solution pond and event pond are identified in **Table 2.2-7**. Environmental Protection Measures (EPMs) for lined ponds would minimize impacts to wildlife (MMI, 2016a) and are presented in Section 2.2.20.

Table 2.2-7 Design Parameters for the Solution Pond and Event Pont

Pond Name	Crest Width (feet)	Crest Length (feet)	Pond Sideslopes (H:V)	Total Depth (feet)	Pump Dead Storage (feet)	Freeboard (crest to spillway) (feet)	Operating Capacity (gallons)	Total Pond Capacity (gallons)	Surface Area at Crest (square feet)	Liner System
Event Pond	225	330	3:1	26	4	2	5,970,800	7,027,400	74,250	80-mil over 60-mil HDPE
Process Solution Pond	225	350	3:1	30	4	2	7,730,000	9,028,000	78,750	80-mil over 60-mil HDPE

When available, make-up water would be pumped from the event pond to either the process solution pond for temporary storage or to the barren solution tank in the ADR plant for incorporation into the solution circuit, as needed. If no water is available in the event pond, make-up water needed in the barren solution tank would be pumped from the process solution pond or the off-site production well, or distributed by gravity from the 500,000-gallon main water storage tank located east of the heap leach pad off the process area entrance road.

Adsorption, Desorption, and Recovery Plant

The Project would use an ADR processing plant. The ADR plant would be sized to handle a solution flow of approximately 2,000 gallons per minute (gpm). The carbon adsorption, stripping, and acid washing vessels would process 2.5 tons of carbon per vessel.

The ADR building would include reagent tanks, pipes, and vessels on a concrete floor with stem walls and joints sealed with “waterstops” to provide secondary containment. Secondary containment would accommodate 110 percent of the largest tank within each individual containment area or within the process building. The sealed concrete floor slab would drain through a pipe-in-pipe to the process pond.

Adsorption of the dissolved gold in the PLS onto activated granular carbon would be conducted in a five stage counter current reactor. Carbon would be advanced through each of the five carbon adsorption columns and contacted with the PLS to maximize the gold concentration on the carbon (carbon loading). The resulting barren solution would be pumped back to the heap.

The loaded carbon would be transferred from the first adsorption column to an acid wash vessel where it would be acid washed to remove impurities, neutralized, and then transferred to a carbon strip vessel. Sodium hydroxide would be added to the cyanide stripping solution to aid stripping and provide electrolytes for the subsequent electrowinning stage.

At the end of the carbon stripping cycle, the stripped carbon would be transferred to a kiln where the carbon would be regenerated at approximately 1,200 degrees Fahrenheit (°F) for 10 minutes. The reactivated carbon would then be transferred back into the last adsorption column for reuse completing the carbon adsorption/desorption cycle.

Recovery of the gold from the carbon strip solution would be conducted in two electrowinning cells. The rich eluate solution would be heated in a heat exchanger to 185°F and then transferred to the electrowinning cells. The precious metal ions would transfer from the solution to the stainless steel wool cathode. The lean eluate solution would then return to the stripping vessel for reuse completing the elution cycle.

The precious metal laden steel wool from the electrowinning step would be transferred to a mercury retort to remove and recover mercury as by-product. Mercury would be volatilized at 1,100°F and then condensed and collected into flasks for storage and/or disposal. Mercury produced by the Project would be managed and disposed offsite as a hazardous waste per 40 CFR 261.33. Elemental mercury would be collected from the onsite laboratory and retort

condenser and transported to a designated Department of Energy long-term storage facility. Spent carbon from the mercury emission control system would be transported and disposed of offsite by a licensed hazardous waste handler.

With the mercury removed, the gold bearing steel wool would then be transferred to the induction furnace for melting. Fluxes would be added to collect any additional impurities and the furnace heated to 2,370°F. The gold would then be poured into cascading molds where it would cool and separate from the slag. The slag would then be removed from the gold doré bullion bars prior to shipment to the market. An illustration depicting the process flow chart can be seen on **Figure 2.2-13**.

2.2.7 Ancillary Facilities

On-site ancillary facilities include various infrastructure buildings, power supply, fuel storage and distribution, water storage and distribution, and roads. **Figure 2.2-1** shows the location of the main ancillary infrastructure.

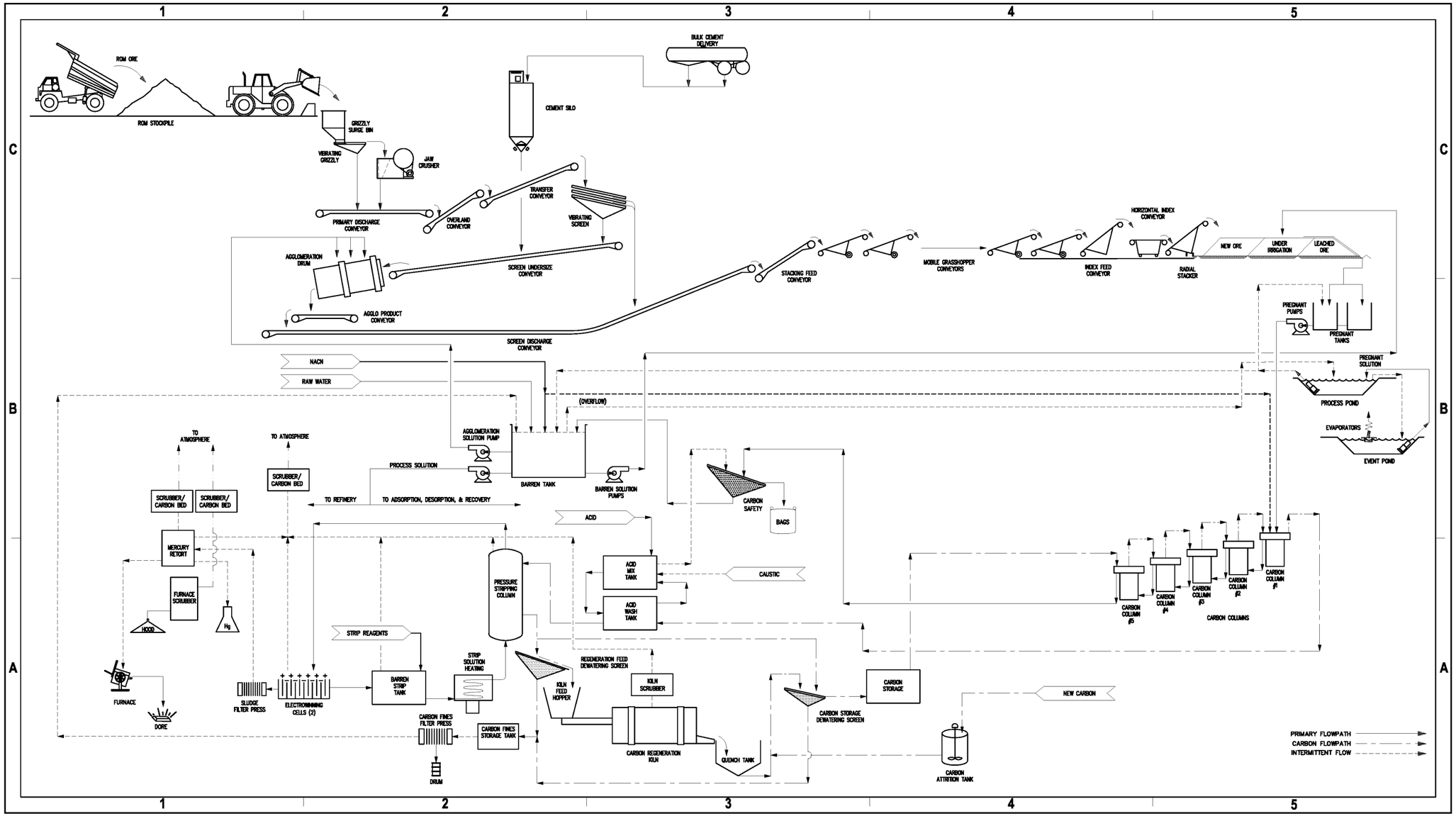
Power Supply

The Project power supply would be provided by a series of three natural gas (LNG or CNG) self-contained generators (two operating and one backup), two 2,175 boiler horse power (1,442 kilowatt [kW] site rating), and one 1,716 boiler horse power (1,083 kW site rating). The location of these generators is shown on **Figure 2.2-1**. Three generators are necessary to allow for fluctuating loads through the Project life and routine preventative maintenance. The generators would be controlled by automatic switchgear that would automatically start or remove generators as load demand increases or decrease.

A self-contained 571 kW diesel generator at the ADR would provide backup power for the process fluid management system in the event of interruption of natural gas supply or catastrophic failure of the primary power supply. This independent back up power supply would ensure that the barren pumps have uninterrupted power to maintain the pump back system to the HLP so the tank and pond levels can be maintained within normal operating volumes at all times.

A separate 455 kW self-contained diesel generator would be located at the primary water well (GBPW-210). This generator would power both the water wells and the booster pumps required to lift water from the well head tank to the 500,000-gallon water storage tank.

All generators would include enhanced generator silencing packages which includes high ambient and sound-attenuated enclosures, use of noise absorbent materials, and an internal exhaust silencer system. The acoustic enclosures used for the LNG generators are estimated to achieve 78 A-weighed decibels (dBA) at a distance of 23 feet, and the acoustic enclosures used for the diesel generator at the production well site is estimated to achieve 75 dBA at a distance of 23 feet.



Source: MMI, 2016a

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

PROCESS FLOW CHART

FIGURE 2.2-13

REVISION **A**

1/19/2017

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Power Distribution

Power distribution within the Plan boundary would consist of a 4,160 volt (V) overhead distribution line connecting the process facilities, offices, and shop/warehouse buildings to the generators. Power would be reduced to 110/220 V or 480 V as required. Anti-perching devices would be installed as described in the EPMs (Section 2.2.20). The overhead distribution line is identified on **Figure 2.2-1**.

Standby Power System

Uninterruptable power supplies would be used to provide back-up power to critical control systems. This equipment would be sized to permit operations to shut down and back up the computer and control systems and to facilitate start-up on restoration of normal generator power. Battery power packs would supply back-up power to the fire alarm system and egress lighting fixtures.

Administration Building

The administration building would be a modular structure, and would contain offices for administration, accounting, human resources, restroom facilities, survey/engineering area, space for cubicles, a meeting/training room, and a lunch room. The location of the administration building is shown on **Figures 2.2-1** and **2.2-10**.

Warehouse and Warehouse Storage Area

The warehouse area would have two offices and an attached shop area, which would also include an office, a two-ton pedestal crane, a compressor and welding outlets. The buildings would share restroom facilities and a lunch area. These facilities are identified on **Figures 2.2-1** and **2.2-10**.

Process/ADR Building

The process building would be a pre-engineered steel building, and would include the ADR plant. The electrowinning/mercury retort and melt furnace would be in an attached building. The ADR operations office, security office, change room and rest room facility would be housed in a two story building attached to the process building. The process building is identified on **Figures 2.2-1** and **2.2-10**.

Laboratory

The laboratory would be a separate building located north of the warehouse building. The laboratory building would consist of a sample preparation room, a fire assay area, Met/Wet (metallurgical/wet assay) laboratory area, two offices, restroom facilities, and a lunch area. The location of the laboratory is identified on **Figures 2.2-1** and **2.2-10**.

Reagents used in the analytical and metallurgical test procedures would be stored at the laboratory in secondary containment and would generally include small quantities of nitric acid, sulfuric acid, hydrochloric acid, and sodium hydroxide. Fire assay reagents would generally include litharge, borax, carbon, silica, and sodium carbonate. Small quantities of other reagents may be used periodically.

Truck Shop and Wash Bay

The truck maintenance shop would be located adjacent to the existing haul road, west of the HLP, as identified on **Figures 2.2-1** and **2.2-10**. The truck shop would have a self-contained wash bay and three bays sized to handle 100-ton trucks. The truck shop building would also include offices, a lunch room, a tool crib, a storage room, and changing rooms. Bulk lubrication and hydraulic oils, anti-freeze and grease would be stored in an attached partition of the building. Used oil and coolant would be transported offsite by a licensed oil transporter for recycling. Other minor chemicals would include aerosol cleaners, sealants, lubricants, and cleaning solvents and supplies. These would be used in de mimimis amounts and would be considered general shop supplies. Parts washing solvents would be contained in the parts washer that is serviced periodically by a parts washer supplier. Used oil would be stored in either a 1,000-gallon tank or 660-gallon totes in the truck shop containment area, and would be recycled by either the fuel and lubricant supplier or a used oil recycler. The wash bay would be a zero-discharge facility. Used wash water would drain to an oil water separator; oil collected from the wash water would be transported off-site by the licensed oil transporter.

Fuel Storage

There would be fuel storage at the administration and process area to supply gasoline for light vehicles and off-road diesel located adjacent to the truck shop for haul trucks and mine equipment (**Figures 2.2-1** and **2.2-10**). The truck shop station would contain two 10,000-gallon diesel fuel storage tanks and one 5,000-gallon gasoline storage tank in the administration area for light vehicles.

LNG or CNG Storage

LNG or CNG would be stored in two 10,000-gallon tanks located adjacent to the generators in the designated area shown on **Figures 2.2-1** and **2.2-10**. If LNG is used, cryogenic tanks would be required.

Septic

Four septic systems would be installed: one would service the process building; one would service the administration building and laboratory; another would service the truck shop; and the last would service the warehouse/shop. The mine and crushing facilities would use portable toilets serviced by a contractor.

Communication Facilities

Mine operations would be supported by an on-site radio system. For the safety of employees, contractors, and regulators, communications with outside systems would be maintained through the use of internet and cell phones.

Monitoring Wells

The groundwater monitoring program for baseline water monitoring would be conducted as described in the site Monitoring Plan included in the Plan. Facility groundwater monitoring during operations would be carried out in accordance with the NDEP WPCP requirements. Monitoring wells are located near the HLP, as shown on **Figure 2.2-1**. MMI has installed three monitoring

wells (GBMW-01, GBMW-02, and GBMW-03) within the Project process area to monitor groundwater in the vicinity of the HLP and ponds. Data from these wells has been submitted to the NDEP on a quarterly basis and serves as the baseline water quality data for the HLP area. GBMW-02 would be plugged and abandoned in accordance with applicable NAC 534.4365, 534.4369 and 534.4371 regulations prior to HLP construction as it is within the HLP lined area and would be covered by the heap. GBMW-03 would continue to serve as the down-gradient monitoring well for the HLP and process ponds area. An additional groundwater monitoring well (GBMW-04) was installed near the Project's production water well (GBPW-210) southeast of the Plan boundary. Groundwater monitoring activities would consist of quarterly testing of Profile I constituents, water elevation, field pH, specific conductance, and temperature. The locations of the monitoring wells are shown on **Figure 2.2-1** (MMI, 2015a and 2016). The entire ground water monitoring program has been proposed to be maintained into the post-closure monitoring period to demonstrate performance of the closure activities. The monitoring program would be conducted until concurrence is received from NDEP and BLM that the closure commitments in the Final Plan for Permanent Closure (submitted two years prior to final closure) have been achieved. The monitoring plan is included as Appendix C of the Plan.

Class III-Waivered Landfill

A Class III-waivered solid waste landfill would be located on the south side of the Pick East Lower WRDA (**Figure 2.2-1**). This on-site landfill would only be used for the disposal of nonhazardous solid wastes generated at the site including waste paper, wood, scrap metal, and domestic trash. The Class III-Waivered Landfill would be closed during reclamation of the Pick East Upper WRDA, at which time a new mine site landfill would be sited and permitted for all nonhazardous solid wastes.

Borrow Areas

Local clay borrow sources in the Cabin Creek Pit area would be borrowed for construction of the low-permeability, secondary liner layer. It is currently anticipated that a borrow source for construction fill material would not be needed for the Project. However, if a borrow source were needed for construction fill material, borrow material would come from the HLP and building area, pre-disturbance footprints.

Fencing

Solar powered security gates would be installed at the Project boundary on Atlas Haul Road and North Robert's Creek Road, as identified on **Figure 2.2-1**. These security gates would be equipped with an electronic keypad for use by mine personnel, and a wireless remote entry system for site visitors. Signage would direct all site visitors to the administration building.

The buildings and process facilities including the warehouse/shop, office, laboratory, ADR plant HLP, and ponds would be fenced to specifications outlined in the BLM Handbook 1741-1 and the NDOW Industrial Artificial Pond Permit, as applicable. In addition, individual facilities, including the Hazardous Waste Storage, ADR plant, ponds, LNG/CNG storage tank and natural gas generators would be fenced separately. In areas where a higher level of security is required,

chain-link fences would be erected. Proposed fencing is illustrated on **Figure 2.2-1.** Proposed fencing surrounding the process buildings and ponds is shown in detail on **Figure 2.2-1**.

Inter-Facility Disturbance

Islands of vegetation between facilities that would likely become disturbed during Project construction and operations have been identified as Inter-facility Disturbance (**Figure 2.2-1**). These areas would be designated as yards for reclamation purposes.

2.2.8 Stormwater Management

Stormwater management for the WRDAs would consist of implementing BMPs such as straw wattles, sediment traps constructed with straw bales, or sediment basins located downstream of the WRDAs. In general, stormwater diversion and erosion/sediment structural control BMPs include the following types (MMI, 2015b):

- Upstream Control: Diversion of stormwater that originates upstream of roads, disturbed areas, and other potential pollution sources would be accomplished by using a combination of berms, channels, culverts, and water bars. These control measures would divert and minimize the amount of upstream stormwater potentially contacting disturbed areas or pollution sources. Erosion protection consisting of a riprap channel lining may be used in steep or constricted areas to limit the scouring effect of stormwater.

- Downstream Control: Downstream stormwater controls aim to manage stormwater that has contacted a potential pollution source (contact water) and include a combination of berms, channels, culverts, water bars, sediment basins or sediment traps. Downstream structural controls would capture stormwater originating on WRDAs, roads or stockpiles and direct it to sediment basins or sediment traps to reduce velocity and deposit suspended sediment. Erosion protection consisting of a riprap channel lining may be used in steep or constricted areas to limit the scouring effect of stormwater.

- Temporary Construction Controls: Temporary construction structural controls would be implemented for short-term construction activities. For temporary construction controls, a combination of silt fences, straw bales, straw wattles, and/or temporary diversion ditches would be installed. Temporary construction structural controls may be relocated as construction activities progress.

The HLP and process facility are designed together as a “zero-discharge facility”, i.e., all accumulations resulting from the 25-year, 24-hour storm event is completely contained. The leach pad would be constructed with an 80-mil HDPE primary liner above a low permeability (less than $1x10^{-6}$ cm/sec, or approximately 3.9×10^{-7} inches per second) soil layer. The clays to be used for the soil layer would come from the overburden area below Cabin Creek (within proposed footprint of proposed disturbance). Rainfall on the leach pad would combine with process fluids and discharge into the pregnant storage tanks and then flow into the process solution pond. The process solution pond would be double-lined with 80-mil HDPE geomembrane primary liner, 80 mil HDPE secondary liner, and a LCRS. The process and event ponds are sized to contain a 25-year, 24-hour storm volume and to withstand a 100-year, 24-hour storm event. An internal spillway would connect the process solution and event control pond and allow solution to pass between the two double-lined ponds during storm events. The event pond design includes an

emergency spillway to discharge flows exceeding a 100-year, 24-hour storm event to a natural drainage downstream from the pond. The internal spillway would be set one-foot lower than the elevation of the emergency (external) spillway to allow both ponds to collectively store a 100-year storm volume without discharge through the emergency spillway. The process building would include reagent tanks, pipes, and vessels on a concrete floor with stem walls and joints sealed with “waterstops” to provide secondary containment. Secondary containment would accommodate 110 percent of the largest tank within each individual containment area or within the process building. The sealed concrete floor slab would drain through a pipe-in-pipe to a process pond.

Diversion channels would be constructed upstream of the HLP and process ponds to divert potential stormwater run-on from impacting the facilities. The channels would be located on the upstream side of the existing Atlas Haul Road, the run-of-mine haul road, and the HLP perimeter access road (**Figure 2.2-1**). Diversion channels would be armored with riprap where necessary to reduce velocity and potential for scouring and erosion. Roadside ditches and/or berms would be located upstream of the crusher facility and ore stockpile to divert potential stormwater run-on from entering these facilities. Diverted runoff would be returned to natural drainages and report to a sediment basin to limit migration of sediment downstream of the Project site.

The results of the waste rock characterization indicate a minor amount of waste rock material (six percent) has the potential to generate acid. This material would be identified and actively managed as designated waste to isolate the material from the effects of weathering and to eliminate the potential for acid rock drainage as described in the WRMP located in Appendix B of the Plan (MMI, 2016a). Stormwater originating from WRDAs would be managed with BMPs consisting of straw wattles, sediment traps constructed with hay bales, or sediment basins located downstream of the WRDA. Proposed sediment basin locations are shown on **Figure 2.2-1** and are sized to settle fine sand particles (diameter of 0.01 millimeter [or approximately 0.004 inches] is considered fine sand according to the ASTM method D2487) during the peak flow into the basin for a two-year, 24-hour storm event.

Stormwater runoff originating on roadways and the growth media stockpiles would be directed via berms and swales into sediment traps consisting of straw wattles and straw bales. Sediment traps would be constructed at strategic locations based on topography and catchment area (MMI, 2015b and 2016).

2.2.9 Water Needs and Uses

Non-Potable Water/Production Water Supply

The peak make-up water requirement for the Project is 500 gpm. The water source for the Project would be primary production water well GBPW-210, and a secondary production water well GBPW-211. Water from the production wells would be pumped to a 500,000-gallon storage tank, located on the west side of the HLP. A pump located near the ADR would lift water to a second 50,000-gallon water tank located west and above the truck shop. This tank would supply water to the truck shop and the jaw or impact crusher, screen area, and lime silo for dust control, and to

the water truck load out for seasonal dust suppression. Production wells, water tanks, and the water pipeline corridors are located as shown on **Figure 2.2-1**. The majority of the water pipeline corridor would be within the footprint of the proposed and existing roads or the footprint of another facility.

Potable Water

Water from the 50,000-gallon water tank would supply a potable drinking water tank/drinking water system. The drinking water system would be permitted by the Nevada Bureau of Safe Drinking Water. The potable water tank is identified on **Figures 2.2-1** and **2.2-10**. Pipelines for the potable water system would be isolated from pipelines for non-potable water with backflow prevention, but would exist within the same water pipeline corridor shown on **Figure 2.2-1**.

2.2.10 Hazardous Materials Storage

The fuel stations would be located outdoors, the mine fleet fuel station adjacent to the truck shop would contain two 10,000-gallon diesel fuel storage tanks and the light vehicle station near the administration building would contain one 5,000-gallon gasoline storage tank. These tanks would be within secondary containment that consists of an HDPE liner or a sealed concrete curb that would hold 110 percent of the largest volume tank and have additional capacity to hold a 100-year, 24-hour storm event. The secondary containment would contain leaks and would supply both bulk and independent vehicle dispensing equipment.

Most reagents would be stored in tanks located outside of the process facilities in secondary containment. The secondary containment for the reagent tanks would hold 110 percent of the largest volume tank or tanks in series (i.e., tanks that flow from one to another by gravity) and, if outdoors would include additional capacity to hold a 100-year, 24-hour storm event (NAC 445A.436). The floor of the reagent storage areas would be sealed to prevent spills from entering cracks or permeating the concrete and being released to the environment. Bulk handling systems would be provided for the receipt, storage, mixing and distribution of sodium hydroxide, sodium cyanide, hydrochloric acid, anti-scalant, and activated carbon. **Table 2.2-8** presents the primary reagents that would be used and the volumes that would be stored on site. MMI may elect to substitute reagents with similar chemical compositions for those listed if higher efficiencies could be realized. Additional information regarding solution management and containment is included in the WPCP (Appendix B.2) (MMI, 2016b). The Project is expected to meet the definition of a Small Quantity Hazardous Waste Generator as per 40 CFR 262.34(d), whereby the operations would generate more than 100 kilograms per month but less than 1,000 kilograms per month of hazardous wastes.

Drivers off-loading fuel would be MSHA certified. Appropriate equipment would be located within the secondary containment to facilitate collection of spilled fuels, if necessary. A sump would be located at one end of the secondary containment so that spilled fuels could be pumped from the secondary containment using a portable pump. Collected fuel would be pumped into either drums or tanks, and would be recycled or disposed of off-site in accordance with applicable federal, state, and local regulations.

Other smaller quantities of hydrocarbons, fluxes, and reagents (such as borax, sodium nitrate, silica, soda ash, sodium carbonate, and calcium fluoride) would be located at the truck shop, warehouse, and process area. These would be kept indoors in proper storage and secondary containment systems.

Reagents used in the analytical and metallurgical test procedures would be stored at the laboratory in secondary containment and would generally include small quantities of nitric acid, sulfuric acid, hydrochloric acid, hydrofluoric acid, and sodium hydroxide. Fire assay reagents would generally include litharge, borax, carbon, silica, and sodium carbonate. Small quantities of other reagents may be used periodically. Lab sinks would be designated either as an “acid” sink or a “base” sink. These sinks would drain to tanks within secondary containment. The tank contents would be neutralized on a regular basis. The neutralized waste would be disposed of in accordance with applicable federal, state, and local regulatory requirements.

Table 2.2-8 Primary Fuels, Reagents, and Volumes

Chemical	Container	Storage	Usage
Fuels			
Diesel	10,000-gallon	2 tanks	1,290,000 gals/yr (or 3,534 gals/day)
Gasoline	5,000-gallon	1 tank	116,000 gals/yr (or 318 gals/day)
Maintenance			
Engine oil	660-gallon bulk tote containers or 55 gallon drums	3 totes	10,000 gals/yr
Engine coolant	660-gallon bulk tote containers or 55 gallon drums	2 totes	15,000 gals/yr
Hydraulic oil	660-gallon bulk tote containers or 55 gallon drums	2 totes	5,000 gals/yr
Differential oil	660-gallon bulk tote containers or 55 gallon drums	1 tote	3,000 gals/yr
Parts washer solvents	Contained in a parts washer	8 drums (4 active, 4 reserve)	1,500 gals/yr
Crushing			
Dust Suppressant (surfactant – tackifying agent)	30-gallon drums	2 drums	20 lbs/day
ADR Plant			
Sodium Cyanide (NaCN) – Dry	Dry tanker truck	12 tons	2,500 lbs/day
NaCN – mix at site to 25% NaCN	6,000 gallon-tanker truck load	25,000 gallons	
Cement	25-ton truck load	100-ton silo	60 tons/day
Calcium Oxide (CaO) – dry pebble at 90% CaO	25-ton truck load	60-ton silo	4 tons/day
Anti-Scalant (liquid surfactant)	240 lb carboy	2 carboys	30 lbs/day

Chemical	Container	Storage	Usage
Fluxes			
Borax – Pentahydrate – Dry	50-lb sacks	20 sacks	20 lbs/day
Silica – (SiO_2) – Dry	50-lb sacks	10 sacks	10 lbs/day
Niter – ($NaNO_3$) – Dry	50-lb sacks	5 sacks	--
Feldspar – Dry	50-lb sacks	5 sacks	--
Mercury Control			
Sulfide Impregnated Carbon dry	50-lb sacks	40 sacks	25 lbs/day
Mercury Recovered			
Mercury (Hg)	80 lbs/flask	--	5 lb/day
Carbon Acid Wash and Neutralization			
Hydrochloric Acid (HCl) liquid 95%	250 gallon totes	2 totes	10 lbs/day
Sodium Hydroxide – (NaOH) – Dry - mix at 20% solution	250 gallon totes	2 totes	5 lb/day
Electrolytes			
Sodium Hydroxide – (NaOH) – Dry	20-lb sacks	10 sacks	15 lbs/day
Total Electrolytes for ADR Plant		**20 sacks**	**20 lbs/day**
Assay and Met Lab			
Sulfuric Acid (H_2SO_4) Reagent Grade	1 gallon	6	--
Nitric Acid (HNO_3) Reagent Grade	1 gallon	10	1 lb/day
Hydrofluoric Acid (HF) Reagent Grade	1 gallon	2	--
Hydrochloric Acid (HCl) Reagent Grade	1 gallon	4	--
Sodium Cyanide (NaCN) Reagent Grade – Dry	5-lb box	10	1 lb/day
Buffer Solution Reagent Grade – Dry	5-lb box	10	--
Lead Nitrate ($PbNO_3$) –Dry	20-lb bag	1	--
Acetylene	Size 4.5 Industrial Acetylene Cylinder	3 - Lab 15 - Shop	2 cylinders per week
Fluxes			
Borax Penta – Use Plant Source	--	--	--
Silica – Use Plant Source	--	--	--
Lead Oxide – Reagent Grade	80-lb/pail	--	2 lbs/day
Methyl Ethyl Ketone	5-gallon pail	1 pail	--
Silver Inquart	10 lbs/package	1 package	--

gals/yr = gallons per year
gals/day = gallons per day
lbs = pounds
lb = pound

2.2.11 Explosive Materials Storage

Explosive agents would be purchased, transported, stored, and used in accordance with the MSHA, the Bureau of Alcohol, Tobacco, Firearms, and Explosives and the Department of Homeland Security regulations, and other applicable federal, state, or local legal requirements. The primary explosive used would be ANFO. Explosive agents, boosters, and blasting caps would be stored within a secured explosives storage area (**Figure 2.2-1**).

2.2.12 Water Supply Pipeline

The Proposed Action would require a water supply pipeline which would extend from two production wells on Roberts Creek Ranch to a 500,000-gallon storage tank, located on the west side of the HLP. A pump located near the ADR would lift water to a second 50,000-gallon water tank located west and above the truck shop. The water pipeline would provide the primary water supply to the Project. The water supply pipeline would be within the Plan boundary. Where portions of the proposed water supply pipeline cross private land, an easement between MMI and the private land owners would be executed.

The estimated peak water usage for the Project during operations is approximately 500 gpm, or up to a maximum of 500 acre-feet per year (AFY). Peak water requirements would occur during the summer, when both water for mine dust suppression and construction are required. The Gold Bar Process Road would provide access to the water pipeline during construction. The proposed pipeline and associated facilities would take approximately one to two months to construct. Brush and debris within the footprint of the trench may need to be removed for construction of the water pipeline.

The water pipeline would be approximately four miles long. The water pipeline would cross approximately 3.8 miles of public land and approximately 1,446 feet of private land. Portions of the water supply pipeline are included in other proposed disturbances, including the proposed disturbance area of North Roberts Creek Road and the mine road. All temporary use areas would be within the project boundary, and no additional areas outside of the project boundary would be needed for staging during construction or maintenance of the water pipeline. The water pipeline would be buried on the shoulder of the roads, where possible. The trench would be 48 inches deep and a minimum of 24 inches wide at the base. The water pipeline would be seated on a minimum of four inches of fine aggregate pipe bedding. The trench would be backfilled to a minimum of eight inches above the pipeline with fine aggregate pipe bedding. The remainder of the trench would be backfilled with random fill and compacted. The water pipeline would be constructed of eight-inch inside diameter pipe. The pipe would be a combination of DR-7.5 and DR-9 HDPE. The pipeline would be designed to operate at a maximum of 225 pounds per square inch.

Prior to digging a trench for the pipeline, the top six to 12 inches of growth media would be stripped and placed to one side, while the soil would be excavated from the trench and placed on the other side of the trench. Once the pipe is installed, the trench would be backfilled to the ground surface, and the growth media would then be spread back over the excavation. The pipeline would have

grades ranging from one to seven percent. The aggregate required for the pipeline construction would be determined during the final pipeline design and coordinated with the BLM.

2.2.13 North Roberts Creek Road

Part of the Proposed Action consists of widening North Roberts Creek Road to a 60-foot total road disturbance footprint. MMI is proposing to improve approximately 2.3 miles of the existing North Roberts Creek Road to 60 feet wide. This road would be used for light vehicle traffic as discussed in Section 2.2.2 and are within the Plan boundary. Where the portions of the proposed North Roberts Creek Road cross private land, an easement between MMI and the private land owners would be executed.

Improvements to the road would meet the requirements of both Eureka County and/or Nevada Department of Transportation (NDOT), and MMI during operations. MMI would enter into a cooperative agreement with Eureka County for maintenance activities on this mine access route. No additional temporary access would be needed during road improvement activities and no temporary use areas would be needed for staging during improvement or maintenance activities. MMI would be responsible for all road improvement activities.

Aggregate road base may be needed for the widening of North Roberts Creek Road. If needed, the road base would be purchased from off-site private sources (Roberts Creek Ranch) or come from the mine site and be transported to the construction site in dump trucks. The amount of road base required to improve the road would be determined during final road design and coordinated with the BLM. Improvement of the existing road would occur after BLM issues the decision for the Plan. It is anticipated that improvements to the existing road would take approximately one month. Vegetation would be cleared within the disturbance area, and soil would be stockpiled along the road for future reclamation use at the mine site, if needed.

2.2.14 Atlas Haul Road

Part of the Proposed Action is to use Atlas Haul Road, which includes 6.8 miles of existing gravel road with a total road width of 80 feet. Atlas Haul Road was used between 1986 and early 1994 by the Atlas Corporation to haul ore from the existing open pits within the Project mine boundary to the former Atlas Mill area for processing. Atlas Haul Road would be used for heavy vehicle traffic to the Project. Easements across private land would not be required for Atlas Haul Road since there is a Prior Existing Right because the road existed prior to the patents being granted. The road is documented in the Mineral Surveys for the Patent Application as an existing road and access through the patent cannot be restricted (BLM, 1986b, 1986c, and 1986d).

No new road construction, improvements, or temporary use areas for staging would be required. MMI would be responsible for all maintenance activities on Atlas Haul Road. Aggregate road base may be needed for maintenance of the existing road. If needed, the road base material would be purchased from off-site private sources (Roberts Creek Ranch) or come from the mine site and transported to the construction site in dump trucks. The amount of road base required would be determined during the final road design and coordinated with the BLM. The amount of road base

that would be needed to improve the road is currently unknown and would be determined based on road maintenance needs.

2.2.15 Exploration

MMI has conducted exploration within the Project mine boundary and is currently responsible for reclamation of the associated disturbances (**Figure 2.2-14**). Exploration activities have consisted of drill roads and pad construction, surface sampling, trenching, bulk sampling, and drilling using both reverse circulation and core drill rigs. Exploration activities have also included geotechnical investigations, geophysical surveys, water exploration, and monitor well installation. Exploration has been conducted under a series of BLM notices in accordance with 43 CFR 3809.300 et seq. A summary of the authorized notices, including acres authorized, is provided in **Table 2.2-9**. Upon approval of the Plan and issuance of a ROD, these notices would be incorporated into the Plan and officially closed. MMI has submitted an amendment to NOI NVN 086229 to conduct an investigation of a clay source for use as a clay liner for the HLP, as shown on **Figure 2.2-14**. This investigation would include eight geotechnical borings and eight shallow trenches that would be entirely within the proposed Cabin Creek pit footprint.

Table 2.2-9 BLM Notice Summary for the Gold Bar Mine Project Exploration Activities

Serial Number	Geographic Name	Total Acres Authorized
NVN085490	Target	4.47
NVN086229	Satellite	3.18
NVN087459	Pads	2.35
NVN090300	Heap	2.09
NVN082329	Hunter	3.94
Total		**16.03**

Source: MMI, 2016a

MMI proposes to include an additional 49 acres of exploration-related surface disturbance, for a total of 65 acres with the existing authorized Notices. Exploration operations would continue through the life of the Project. Proposed exploration disturbance would generally include construction of access roads, drill pads, sumps, trenches, surface sampling, bulk sampling, and staging areas. Exploration methods would include both reverse circulation and core drilling, with minor trenching also planned. Exploration activities may also include water exploration and monitor well installation. Exact locations of the exploration disturbance have not been determined. However, exploration operations would include an additional 65,000 linear feet of drill road (average width of 20 feet) and 300 drill pads (average dimensions of 40 feet by 70 feet). Drill holes would have an average diameter of five inches and a maximum depth of 1,200 feet below ground surface. No more than three exploration drill rigs would be on site at any given time. Drilling would utilize conventional reverse-circulation or core rigs. Placement of drill holes would be guided by reserve requirements, geotechnical studies, geochemical exploration results, and geochemical sampling. The roads and pads would be sited as much as possible to avoid any identified cultural resources. If additional disturbance for exploration activities is necessary, an amendment to the Plan would be prepared and submitted to BLM for review and approval. MMI would provide the

BLM and NDEP with annual documentation of surface disturbance locations for the exploration activities and any completed concurrent reclamation as required by Nevada Revised Statue (NRS) 519A and NAC 519A on or before April 15 of the following year.

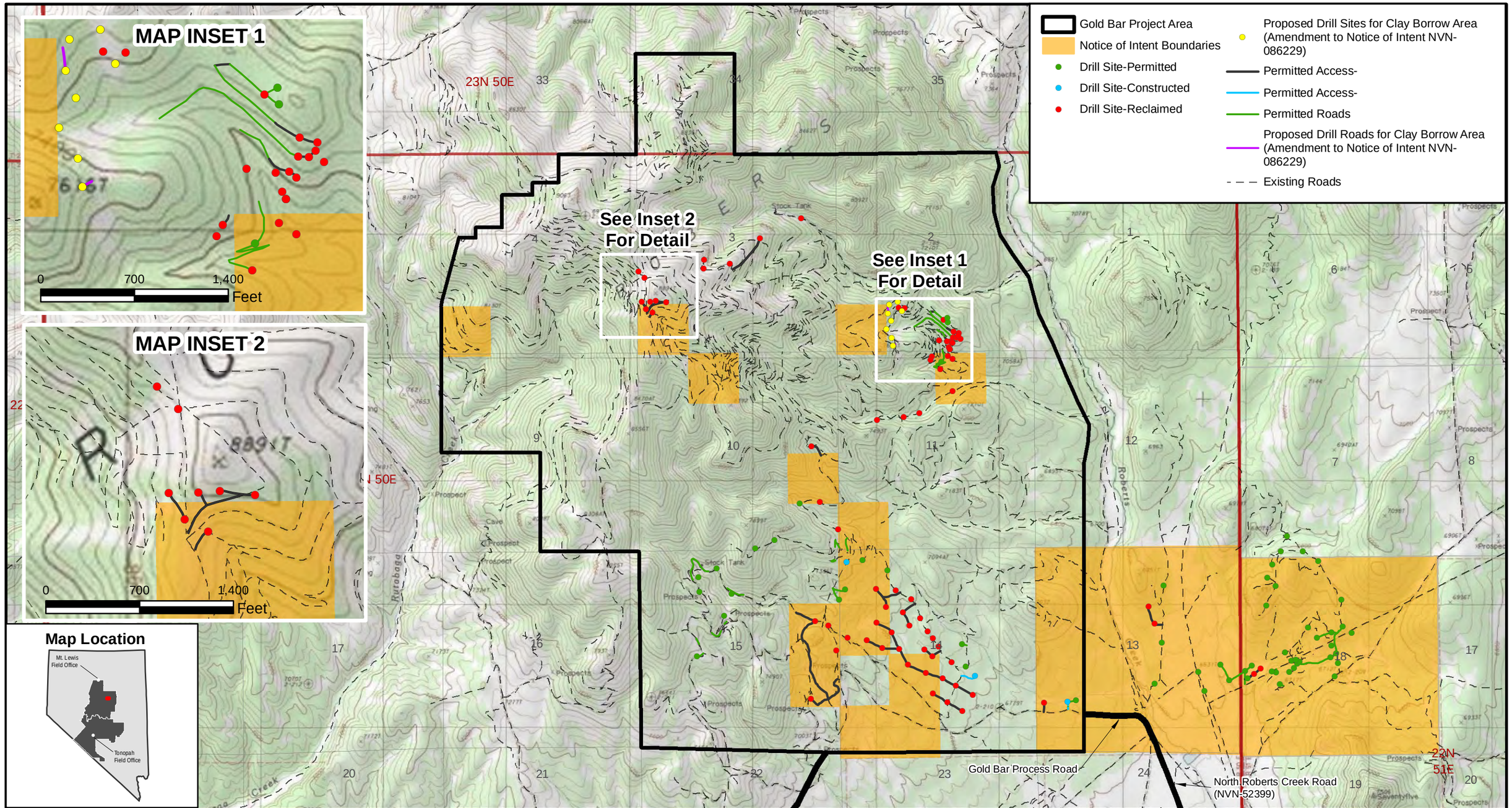
2.2.16 Work Force and Schedule

Anticipated average staff for the mining operation is shown in **Table 2.2-10**. Blasting would be done by a contractor using a three-man blasting crew. The three-man blasting crew is included in **Table 2.2-10**. The mine is scheduled to operate on two, 10-hour or 12-hour shifts per day, 360 days per year. The mine would require an average of 91 mining staff. This number would vary based on the mining schedule and haulage requirements. The leach facilities would operate 365 days per year and process manpower includes crusher, agglomerator, and conveyor operators, ADR plant workers, and laboratory managers and technicians. A total of 30 staff would support leaching and processing (**Table 2.2-11**). An additional 14 staff would provide general and administrative support to the operations (**Table 2.2-12**). The combined manpower total for the operation would be up to 135 employees, comprised of contractors and MMI staff. All 135 employees would not be on site every shift since the mine would run with two shifts, a morning shift and a night shift, with four rotating crews to provide for seven days per week, 365 days per year coverage. The rotating day and night shift mining and processing crews are made up of four crews of approximately 25 employees each that are scheduled to provide coverage for the 14 shifts per week (day and night) including holidays when the process crew must be on site.

Table 2.2-10 Mining Personnel

Description	Number of Personnel
Mine Superintendent	1
Shift Supervisor	4
Mining Engineer	2
Geologist	2
Surveyor	2
Maintenance Supervisor	1
Drilling & Blasting*	15
Loading	8
Hauling	16
Roads & WRDAs	20
Mechanics and Electricians	16
Maintenance Labor	4
Total Mining Personnel	**91**

*Blasting would be done by a contractor typically using a three man blasting crew.



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0 2,500 5,000 Feet
1 in = 2,500 feet

N

EXISTING AND RECLAIMED EXPLORATION ACTIVITIES

FIGURE 2.2-14

REVISION **A**

1/31/2017

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Table 2.2-11 Processing Staff

Unit	Number of Personnel
Plant Superintendent	1
Metallurgist	1
Shift Foreman	4
Clerk	1
Crushing and Agglomeration	7
Heap	2
ADR	7
Assay Laboratory	3
Maintenance	4
Total Processing Staff	**30**

Table 2.2-12 General and Administrative Personnel

Description	Number of Personnel
General Manager	1
Accountant	1
Purchasing Agent	1
Environmental Manager	1
Safety Manager	1
Technician	2
Clerk	1
Security Guard	5
Janitor	1
Total G&A Personnel	**14**

2.2.17 Equipment

Open pit mining would be carried out by conventional, diesel-powered equipment, a combination of blast-hole drills, rubber-tired wheel loaders, a track-mounted excavator, and off-highway, 100-ton haul trucks and 45-ton articulating trucks. Support equipment comprised of graders, track dozers, and water trucks would aid in the mining of ore and waste rock. A list of primary mining equipment and support mining equipment are provided in **Tables 2.2-13** and **2.2-14**, respectively.

Table 2.2-13 Primary Mining Equipment

Description	Estimated Number Required
Blast Drill Rig	3
Hydraulic Excavator	1
Wheel Loader (Cat 992K or Equivalent)	2
Haul Truck (Cat 777F or Equivalent)	12
Articulating Trucks (Cat 745C or equivalent)	2

Table 2.2-14 Support Mining Equipment

Description	Estimated Number Required
Blasting Truck	1
Motor Grader (Cat 16M or Equivalent)	1
Bulldozer (Cat D8T, D9T and D10T or Equivalent)	3
Water Truck (8,000 gallon)	2
Fuel/lube Truck	1
Mechanics Truck	1
Field Tire Truck	1
Light Plant	8
Light Vehicle	4

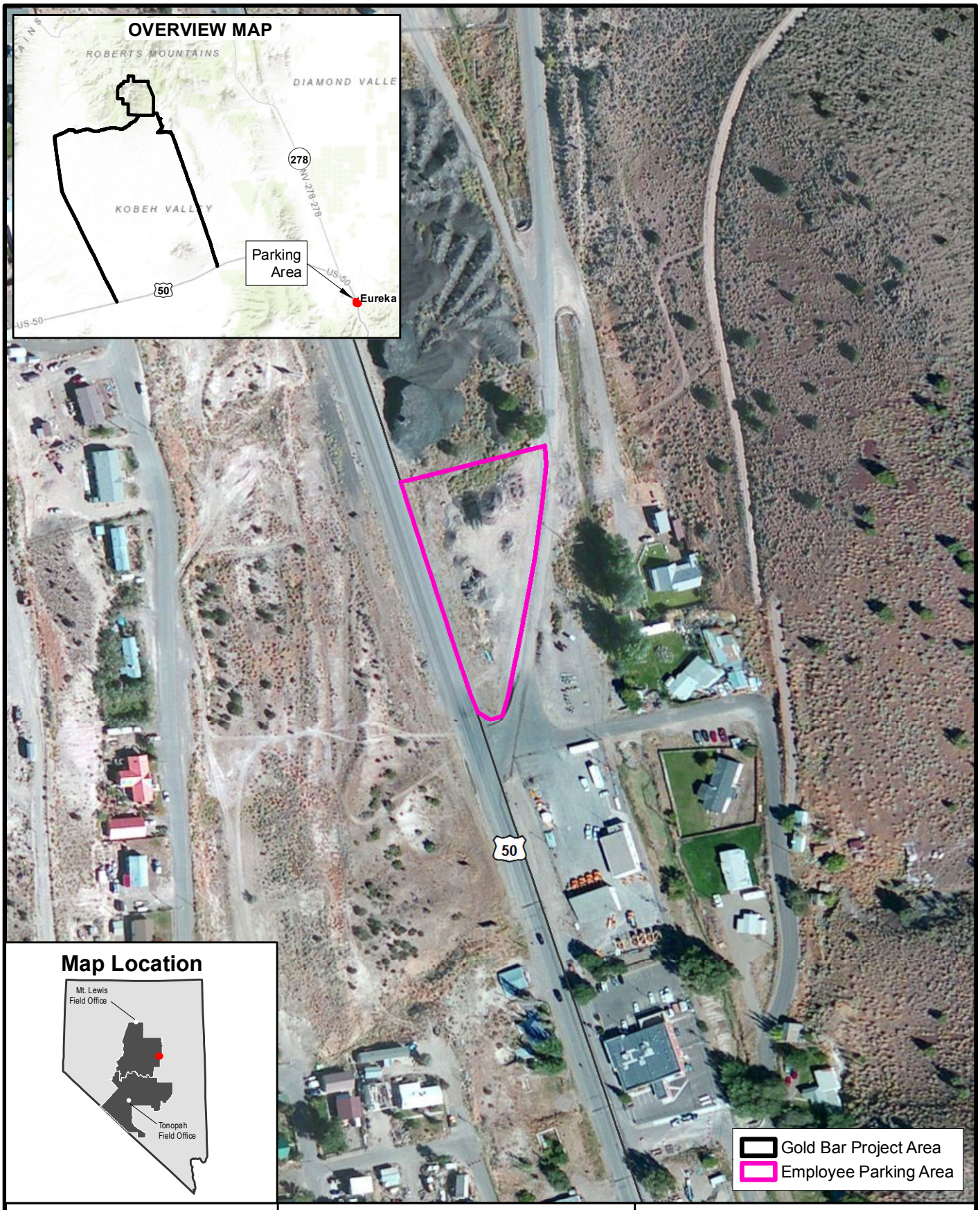
2.2.18 Parking Lot

MMI would lease Lot 500 on County Road 101 to use for employee parking. Access to the lot is immediately adjacent to U.S. Highway 50 (**Figure 2.2-15**). Employees would park at this lot, and would take one of the three passenger vans to the Plan area, per shift. It is estimated that 30 employees would be transported for each shift, for a total of 60 employees per day. The lot is approximately 1.4 acres and is located on private land. The lot would not need any additional construction for parking. The lot currently is graded and improved with compacted gravel to manage stormwater flow into the Eureka stormwater collection ditches. Power, water, and sewer connections have been made to the lot. Low voltage lighting in the parking area is planned for employee safety, which would be installed in conformance with Eureka County requirements to ensure no lighting impacts on the neighboring properties.

2.2.19 Reclamation

Reclamation of disturbed areas resulting from the Project would be completed in accordance with BLM and NDEP regulations. The purpose of the BLM's regulations set forth in 43 CFR 3809-Surface Management is to prevent UUD of public lands by operations authorized by the current mining laws. Anyone intending to develop mineral resources on public lands must prevent UUD of the land and reclaim disturbed areas. This subpart establishes procedures and standards to ensure that operators and mining claimants meet this responsibility and provide for the maximum possible coordination with appropriate state agencies to avoid duplication and to ensure that operators prevent UUD.

The State of Nevada requires that a reclamation plan be developed for any new mining projects and for expansions of existing operations (NAC 519A). The Reclamation Plan (included in the Plan) details the reclamation measures to be utilized for the Project. The intent of the reclamation plan is to restore areas within the Project to a beneficial post-mining land use, prevent UUD of the environment, and reclaim disturbed areas to ensure visual and functional compatibility with surrounding areas. As noted earlier in Section 2.2.1, nearly one-third of the total Project mine disturbance would consist of areas currently disturbed by previous operators and abandoned.



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0 200 400 Feet
1 in = 200 feet
N

EMPLOYEE PARKING AREA

FIGURE 2.2-15

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All surface disturbance associated with the Project would be subject to reclamation as described in the Reclamation Plan (MMI, 2016a). As determined by the BLM, roads on public lands suitable for public access or which continue to provide public access consistent with pre-mining conditions would not be reclaimed at closure. MMI would continue to use Roberts Creek Road or Three Bars Road, North Roberts Creek Road, and Atlas Haul Road to access the Project area for monitoring and other purposes. Atlas Haul Road would be narrowed at closure to become a utility road approximately 12 feet wide. The pits, reclaimed WRDAs, and HLP would remain as features in the landscape, and the process pond and event pond would be converted to evaporation (E) or evapo-transpiration (ET) cells during closure. These facilities would remain for the passive management of draindown solutions from the heap. Additional details (including the draindown curve) are in the WPCP, Appendix I (MMI, 2016b). The detailed E- or ET-cell design would be presented in a Final Plan for Permanent Closure (FPPC) at least two years prior to the closure of the heap leach facility.

Post-Mining Land Use

Pre-mining land uses occurring in the Project area include mineral exploration and development, livestock grazing, wildlife and wild horse habitat, and dispersed recreation. The Project area is relatively isolated and undeveloped. There are no recreation facilities within the Project area and vicinity, and in this part of Nevada, developed or designated recreational opportunities are relatively sparse. In the Project area, opportunities for dispersed recreation primarily include off-highway vehicle use, hunting and camping, mountain biking, horseback riding, sightseeing, outdoor photography, nature study, wildlife viewing, bird watching and rock collecting may also occur. Following closure, the Project area would continue to support the multiple land uses of livestock grazing, wildlife and wild horse habitat, and dispersed recreation. MMI would work with the appropriate regulatory agencies and local governments to evaluate alternative land uses that could provide long-term socioeconomic benefits from the mine infrastructure. Post-closure land uses are in conformance with the BLM Shoshone-Eureka RMP (BLM, 1986a) and Eureka County Master Plan and zoning ordinances. The objectives of the reclamation program are as follows:

- Isolation, control, or removal of acid-forming, toxic, or deleterious substances;
- Regrading and reshaping to conform with adjacent landforms, facilitate revegetation, control drainage, and minimize erosion;
- Placement of growth medium and establishment of self-sustained revegetation;
- Removal or stabilization of buildings, structures, or other support facilities;
- Plugging of drill holes;
- Providing for post-mining monitoring, maintenance, or treatment;
- To provide a stable post-mining landform that supports defined land uses;
- To minimize erosion damage and protect water resources through control of water runoff and stabilization of mine components;

- To establish post-reclamation surface soil conditions conducive to the regeneration of a stable plant community through stripping, stockpiling and re-application of growth media;
- To revegetate disturbed areas with a diverse mixture of plant species in order to establish long-term productive plant communities compatible with post-mining land uses; and
- To maintain public safety by stabilizing or limiting access to landforms that could constitute a public hazard.

Drill Hole Plugging

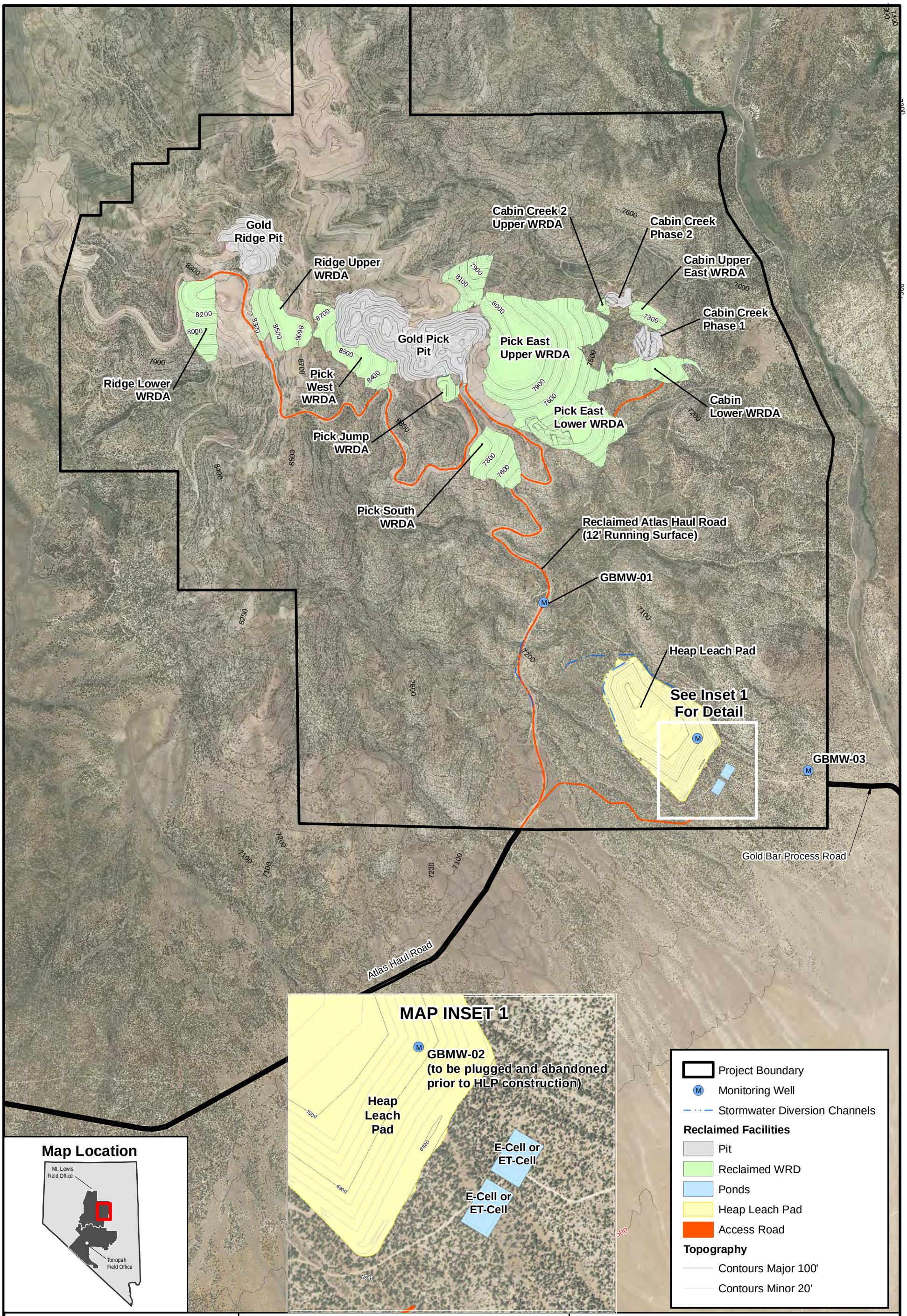
All exploration drill holes and monitoring wells remaining at the close of the Project would be plugged and abandoned in accordance with applicable NAC 534.4365, 534.4369 and 534.4371. Exploration drill holes would be plugged immediately after obtaining all necessary data from the drill hole. A drill hole may be left open for a period of time following the initial drilling if it is anticipated that the hole may be re-entered to drill deeper or to use down-hole geophysical techniques. In the event that a drill hole is left open, a rock or equivalent heavy object would be placed on top of the hole to protect wildlife. Drill holes drilled as part of a monitoring program would be plugged and abandoned following completion of monitoring activities upon approval of the BLM and NDEP.

Regrading and Reshaping

The final regrading plan for the Project is designed to mitigate aesthetic impacts, provide for slope stability, control runoff, and reduce infiltration into mine process facilities. Slopes would be regraded with standard mine mobile equipment (dozers, trucks, loaders, scrapers) to blend with surrounding topography, interrupt straight-line features, and facilitate revegetation where practical. Where feasible, large facilities such as the HLP or WRDAs may be rounded with variable slope angles to mimic nearby topography. Post-reclamation topography is shown on **Figure 2.2-16**. Additional detail for reshaping the WRDAs to facilitate revegetation is provided in the Conceptual Reclamation/Revegetation Plan for the Gold Bar Project Waste Rock Dumps (Cedar Creek, 2016). The WRDA slopes are broken by terraces to facilitate hydraulic application of seed and mulch, flat and gentle slopes are maximized while minimizing the overall footprint and disturbance to native habitats. The flat terraces provide both an opportunity for additional flat surfaces for optimal revegetation potential and also provide slope breaks to reduce erosion potential. The terraces would be graded slightly back into the slope to harvest available water and serve as a tie in to the existing topography where excess water can be shed. Where possible, the dumps have been designed to tie into adjacent ridges so water can drain effectively off the benches from the dumps (Cedar Creek, 2016).

Wildlife Habitat Rehabilitation

Wildlife habitat is one of the designated post-mining land uses and the reclamation plan is designed to establish equivalent or better wildlife habitat compared to existing conditions. The seed mix and reclamation techniques proposed would convert the disturbed areas to a sagebrush and grass -dominated habitat. There are no wetlands or riparian zones located within the Project area.



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0 2,000 4,000 Feet
1 inch = 2,000 feet

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POST-RECLAMATION TOPOGRAPHY

FIGURE 2.2-16

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Handling and Application of Growth Media

Growth media that is practicably salvageable would be removed prior to facility construction. Unless used directly for concurrent reclamation, salvaged growth media would be excavated, loaded, and hauled to one of the designated growth media storage locations (**Figure 2.2-1**). Growth media handling operations would be conducted using dozers, front-end loaders, haul trucks, and other equipment. Growth media would be preferentially placed on the tops and inter-lift benches of the regraded WRDAs with side slopes receiving the balance of available material. Both the top and side-slopes of the regraded HLP would be covered with growth media following regrading. Based on current predictions of available growth media, it is anticipated that approximately 12 inches of growth media would be available for placement on the WRDA surfaces, while approximately three feet of growth media would be available for covering the regraded HLP top and side-slopes. An evaluation of topsoil, alluvium, and geologic materials within the Project boundary has been completed to potentially increase the volumes of growth media available for reclamation (Cedar Creek, 2017a). An estimated growth media balance is provided in **Table 2.2-15** with the Growth Media Salvage Summary provided in **Table 2.2-16**.

Due to the limited growth media resources in the pit areas and WRDAs, alternate sources of material have been identified in the Alternative Growth Media Assessment (Cedar Creek, 2017a). Topsoil, alluvium, and geologic materials within the Project boundary have been evaluated to spatially identify and characterize adequate volumes of topsoil and various alternate growth media for reclamation. Opportunities for growth media salvage are prioritized by the reclamation goals presented in the "Conceptual Reclamation/Revegetation Plans for the Gold Bar Project Waste Rock Dumps" (Cedar Creek, 2016). Material are grouped based on physical and chemical properties that would best accommodate final landform design and post mining land use. As such, Tier 1 materials would comprise of topsoil and alluvium, and target flatter sloped reclamation. Tier 2 materials would target steeper sloped reclamation, comprised of alluviums, weathered waste rock and stockpiled materials, and easily weathered geologic units. These alternate growth media sources include locally sourced geologic materials that can be used to either extend known growth media sources or, with amendments, could be used directly as growth media.

Table 2.2-15 Growth Media Balance

Feature	Facility	Acreage (2D)	Type	Depth (Feet)	Surface Acres	Volume (ft^3) by Type	Total Volume (ft^3)
Growth Media Demand Summary							
Dumps	Cabin Lower	13.18	Tier 1	1	14.12	615,276	1,088,572
		5.92	Tier 1 or 2	1	10.87	473,296	
	Cabin Upper Dump East	3.54	Tier 1	1	3.78	164,576	437,104
		3.28	Tier 1 or 2	1	6.26	272,528	
	Cabin Upper Dump West	0.81	Tier 1	1	0.87	37,923	98,859
		0.68	Tier 1 or 2	1	1.40	60,936	
	Pick East Top	0.59	Tier 1	1	0.66	28,644	1,436,522
		15.33	Tier 1 or 2	1	32.32	1,407,877	

Feature	Facility	Acreage (2D)	Type	Depth (Feet)	Surface Acres	Volume (ft^3) by Type	Total Volume (ft^3)
	Pick East	55.70	Tier 1	1	57.71	2,513,894	9,234,383
		88.67	Tier 1 or 2	1	154.28	6,720,489	
	Pick Jump	2.02	Tier 1	1	2.11	92,011	276,873
		2.26	Tier 1 or 2	1	4.24	184,862	
	Pick South	5.44	Tier 1	1	5.77	251,399	1,293,073
		14.45	Tier 1 or 2	1	23.91	1,041,674	
	Pick West	14.46	Tier 1	1	15.64	681,168	1,752,312
		12.95	Tier 1 or 2	1	24.59	1,071,144	
	Ridge Lower	5.84	Tier 1	1	6.41	279,093	1,470,145
		15.98	Tier 1 or 2	1	27.34	1,191,052	
	Ridge Upper	9.93	Tier 1	1	10.36	451,229	1,706,444
		14.76	Tier 1 or 2	1	28.82	1,255,214	
Dump Subtotal		**285.80**	**Tier 1**	**1**	**117.43**	**5,115,215**	**18,794,288**
			Tier 1 or 2	**1**	**314.03**	**13,679,073**	
Leach Pad		**105.79**	**Tier 1**	**3**	**133.06**	**5,795,950**	**18,217,707**
			Tier 1 or 2	**3**	**44.35**	**12,421,757**	
Reclamation Obligation	East	5.42	Tier 1	1	5.85	254,833	1,490,816
		11.53	Tier 1 or 2	1	28.37	1,235,983	
	West	12.42	Tier 1	1	13.20	575,188	3,000,454
		25.37	Tier 1 or 2	1	55.68	2,425,266	
Reclamation Obligation Subtotal		**54.74**	**Tier 1**	**1**	**19.05**	**830,021**	**4,491,271**
			Tier 1 or 2	**1**	**84.05**	**3,661,250**	
Road Subtotal		**130.57**	**Tier 1**	**1**	**81.42**	**2,307,067**	**7,092,880**
			Tier 1 or 2	**1**	**116.26**	**4,785,813**	
Ancillary/Other Disturbance Subtotal		**70.01**	**Tier 1**	**1**	**58.00**	**2,526,602**	**3,804,875**
			Tier 1 or 2	**1**	**29.35**	**1,278,273**	
Growth Media Demand Total		**710.80**	**Tier 1**	**1**	**408.97**	**16,575,855**	**52,401,021**
			Tier 1 or 2	**1**	**588.04**	**35,826,165**	
Growth Media Demand Total (+20% margin)		**--**	**Tier 1**	**1**	**490.76**	**19,889,826**	**62,881,225**
			Tier 1 or 2	**1**	**705.65**	**42,991,398**	

Source: Cedar Creek, 2017a
ft^3 = cubic feet
[1] Surface acres accounts for slopes of facilities.

Table 2.2-16 Growth Media Salvage Summary

Type	Acreage (2D)	Acre Feet	Total Volume (ft^3)
Tier 1	396.70	1,145.30	49,889,457
Tier 2	84.17	346.46	15,091,589
Growth Media Salvage Total	**480.87**	**1,491.76**	**64,981,046**

Source: Cedar Creek, 2017a
ft^3 = cubic feet

Revegetation

The reclamation plan is designed with the goals of stabilizing mine features, revegetating to reduce runoff and erosion, providing forage for wildlife, wild horses, and livestock, controlling invasive weeds, and reducing overall long-term visual impacts. As such, the revegetation plan for the Project is aligned with these goals, as well as the potential post-reclamation land use(s) of livestock grazing, wildlife, greater sage-grouse habitat, and wild horses. Specifically, the revegetation plan is designed to return disturbed areas to conditions that would support a beneficial and ecologically appropriate vegetation community. The primary effort would emphasize re-establishment of the native species within the soil seed bank and revegetation seed mixtures. A high altitude seed mix would be developed with the BLM based on a review and evaluation of existing vegetation and revegetation success at similar elevations and slope aspects in the Project area. Vegetation monitoring is described in the Conceptual Reclamation/Revegetation Plan for the Gold Bar Project Waste Rock Dumps, which proposes that a program of experimentation and monitoring using test plots or concurrent reclamation be instituted to track, evaluate, and modify reclamation metrics given available growth media (Cedar Creek, 2016).

The initial seed mixture and seeding rates are provided in **Table 2.2-17**. Seed mixes would be refined with the BLM and NDEP using the results of the vegetation community monitoring described in the Conceptual Reclamation/Revegetation Plan for the Gold Bar Project Waste Rock Dumps (Cedar Creek, 2016). The application rates listed are for broadcast seeding after regrading and reshaping activities. Where safe to do so, reclaimed areas would be broadcast seeded with a cyclone-type bucket spreader or a mechanical blower. On flat surfaces, which are accessible to heavy equipment, reseeded areas would be mechanically raked or hand-raked where practicable to provide seed cover and enhance germination. Steeper areas where it would be unsafe to use mechanical seeding equipment would be hydroseeded as described in the Conceptual Reclamation/Revegetation Plan for the Gold Bar Project Waste Rock Dumps (Cedar Creek, 2016). Interim reclamation efforts would emphasize erosion control, weed management, and sustaining soil productivity. Interim reclamation would occur on growth media stockpiles and cut-and-fill.

Table 2.2-17 Proposed Reclamation Seed Mix

Plant Code	Common Name	Seeding Rate (lbs pure live seed per acre)
Achillea millefolium	Western yarrow	0.25
Sphaeralcea coccinea	Scarlet globemallow	0.25
Artemisia tridentata ssp. *tridentata*	Basin big sagebrush	4
Pseudoroegneria spicata	Bluebunch wheatgrass	3
Achnatherum thurberianum	Thurber's needlegrass	3

The seed mixture would be certified weed-free. Seeds would be also certified for purity and percent live seed. Mulch or erosion-control fabric would be applied to erosion prone areas, as necessary. The proposed seed mixture and application rates are subject to modification by the BLM. The actual seed mixture, application rates and locations would be determined prior to

seeding based on the results of interim and concurrent reclamation conducted during operations, or BLM recommendations at the time of final reclamation. The seed mix would be locally sourced, when available.

Isolation, Removal, and/or Control of Acid Forming, Toxic, or Deleterious Materials

Process components would be designed, constructed, operated, and closed in accordance with state regulatory requirements under NAC 445A. The proposed process facilities would be zero-discharge (i.e., no release of process waters to the environment), and the HLP would have engineered liner and leak detection systems in accordance with NAC 445A design criteria. A Waste Rock Management Plan has been prepared and is included in the Plan. This plan describes the methods to manage and monitor waste rock generated during mining at the Project. Hazardous materials would be transported, stored, and used in accordance with federal, state, and local regulations. Relevant employees would be trained in the proper handling of hazardous materials. A Spill Contingency Plan (SCP) is included in the Plan. MMI would have trained personnel at the site 24 hours a day, seven days a week to manage potential spills of regulated materials.

Removal or Stabilization of Buildings, Structures, and Support Facilities

During final reclamation, all surface facilities and structures would be removed. Facilities to be removed include runoff and sediment control structures, as well as all buildings and ancillary facilities that would no longer be used after operations cease. Runoff and sediment control structures would remain, as needed, until reclamation of other disturbances is completed. Any facilities or corridors that could serve a beneficial future use on public lands may remain in place following mining, upon approval by the appropriate regulatory agency. However, proposed reclamation includes dismantling and removal of all facilities, including fences.

Post-Closure Management

Post-closure management would commence on any reclaimed area following completion of the reclamation work for that area. Post-closure management would extend until the reclamation of the site or component has been accepted by both the BLM and NDEP. For sites reclaimed early in the Project schedule, management of the reclaimed sites would occur concurrently with operational site management. Annual reports showing reclamation progress would be submitted to the BLM and NDEP. Post-closure management of long-term draindown from the HLP is discussed under Reclamation of the Heap Leach Facility section below.

Access Roads

Roads within the Project area would be reclaimed during the closure period unless the agencies request that some or all remain. Roads that are needed for site monitoring and maintenance during the post-closure period would remain until final bond release is attained. MMI would work with the BLM to determine if any road should be left permanently post-closure. Roads to be reclaimed would be deep ripped to reduce compaction. Roads with significant cut or fill would have their side slopes rounded and would be regraded to blend into the surrounding topography. Where roads are constructed on hill slope side-cuts, the edge berm would be pulled back against the inside cut of the road. Where necessary, roads would be regraded to re-establish the existing

drainage patterns. Culverts would be removed and drainage crossings would be reshaped to approximate the original drainage. Riprap or other armoring methods would be used if drainage stabilization is necessary to limit scouring of re-established channels. Regraded road surfaces, berms, cut/fill slopes, and associated disturbance would be reseeded using the seed mix developed from the revegetation monitoring program. The seeding would preferably be carried out in the fall before the winter precipitation. If seeding is not carried out immediately after regrading, then the regraded surfaces would be scarified prior to seeding. Reclamation of in-pit haul roads is not proposed. During the growth media evaluation, it was observed that much of the road fill slope materials were serving as growth media and native vegetation has invaded these slopes. During reclamation, these fill slope materials would be directly revegetated and no additional growth media would need to be placed on the reclaimed road side slope surfaces.

Reclamation of Waste Rock, Ore, and Other Stockpiles

One of MMI's primary reclamation objectives is to minimize the overall disturbance associated with the Project. Based on this objective, along with the lack of available growth media and the results of the WRDA slope stability study (included as an appendix to the Plan), the WRDA slopes were designed to be constructed, regraded, and reclaimed to be consistent with the surrounding topography with final average regraded slopes ranging from 2H:1V to 3.8:1V as shown on **Figure 2.2-16**. The final surfaces of the WRDAs would be constructed to create natural appearing topography. On sloped terrain, where safe and practicable, some weathered geologic materials may be pushed downhill below the growth media to construct toe berms and prevent rocks from scattering on the hillsides below the toes of the WRDAs. These rock zones are described in the Conceptual Reclamation/Revegetation Plan for the Gold Bar Project Waste Rock Dumps (Cedar Creek, 2016) and would be constructed to provide similar habitat to natural talus areas.

Closure of the Class III-Waivered Landfill

Because the Class III-Waivered Landfill would exist within the Pick East Upper WRDA, the two facilities would be closed and reclaimed simultaneously (**Figure 2.2-1**). During closure of these facilities, a layer of native cover material compacted to a minimum uniform depth of 24 inches would be placed on the surface of the Class III Waivered Landfill. The cover would be placed on any surface that represents the final grade of the landfill and WRDA, and would be graded to provide proper drainage of surface runoff. A final cover of a minimum of six inches of growth media would be applied to the closed landfill.

Reclamation of the Heap Leach Facility

The HLP would be decommissioned in accordance with NDEP regulations and guidelines for closure. In compliance with NAC 445A.447, a FPPC for the HLP would be prepared and submitted to the NDEP and the BLM two years prior to the anticipated final termination of the HLP operation. It is anticipated that the draindown period would be 12 to 18 months for active water management. E-Cell construction, heap regrading, cover placement, and revegetation activities would take another 12 months following the initial draindown period. Total HLP closure is anticipated to take approximately 7.5 years (including the two years of residual heap leaching), as detailed in the Plan.

Chemical stabilization of the HLP is required to meet the permanent closure requirements. MMI anticipates that the spent heap would be allowed to drain with no fresh water rinsing. Final details of heap neutralization and closure would be developed in the FPPC at least two years prior to Project closure pursuant to the requirements of NAC 445A.446 and NAC 445A.447.

Operational monitoring data for draindown flows and chemistry would be used to confirm modeled flows and form the basis of the FPPC. In the interim, MMI has developed the following conceptual plan for process fluid stabilization:

- Heap construction would occur in two phases, Phase 1A and Phase 1B. During the Phase 1A construction, the process and event ponds have been designed with sufficient storage capacity and surface area to manage draindown flows from the Phase 1A and 1B pad areas and to also facilitate future conversion to an E- or ET-cell. Construction of the event pond with sufficient evaporation area to accommodate predicted long-term draindown flow rates at closure would have the operational advantage of providing increased emergency storage capacity in the event of greater than design precipitation. The detailed ET-cell design would be presented in the FPPC at least two years prior to the closure of the heap leach facility;

- Following cessation of leaching, process solution would be recirculated from the process solution pond and event pond to the HLP to promote evaporation until draindown volume has been reduced sufficiently to allow for conversion to a passive management system;

- The HLP would be regraded;

- Growth media material would be placed on the HLP with the aim of reducing contact of meteoric water with spent ore and limiting infiltration of meteoric waters, thus reducing long-term flow from the HLP to a *de minimus* quantity; and

- The process pond and event pond would be converted to E- or ET-cells to store and remove post-closure heap draindown without release to the environment.

After the HLP solution inventory is sufficiently reduced, the heap would be regraded, compacted, covered with three feet of growth media, and revegetated. MMI has evaluated topsoil, alluvium, and geologic materials within the Project boundary to potentially increase the volumes of topsoil and various alternate growth media available for reclamation (Cedar Creek, 2017a). The heap would be constructed in lifts with benches designed to allow side-slope regrading to 3H:1V slopes without the spent ore being pushed off the containment liner. The heap top surface would be graded with a minimum five percent slope to promote runoff. The regraded top surface would be compacted to reduce permeability and limit stormwater infiltration. Grading would incorporate rounding of the heap corners to blend with natural topography. The side-slopes would be graded to a minimum 3H:1V slope. The regraded heap geometry would approximate the surrounding natural topography and would mitigate visual impacts, provide stability, promote runoff, and reduce infiltration.

Regraded surfaces would be covered with the growth media salvaged from within the HLP footprint during construction of the HLP. Growth media would be stockpiled near the HLP in order

to facilitate reclamation. The material would be evenly distributed with approximately three feet of growth media over the regraded surfaces. The growth media cover would allow for retention of water in the cover material during snow melt and precipitation and support establishment of vegetation. By retaining the water in the soil cover for plant uptake and evapotranspiration, the amount of water infiltrating into the underlying spent ore would be reduced, thus minimizing the draindown solution and seepage from the HLP. The final surface of the HLP cover would be uneven to provide a more suitable environment for plant growth by allowing some water storage on the uneven surfaces and reducing sediment yield.

Piping from the Solution Recovery System around the perimeter of the HLP would be left in place to facilitate conveyance of draindown solutions. Additional perforated piping and gravel would be installed along the regraded HLP perimeter and within the exposed solution collection channels and would connect to the proposed pregnant solution conveyance pipeline. This piping and gravel would be used for long-term draindown management to collect and convey infiltrating meteoric water that passes through the HLP cover to the E- or ET- cell. The perforated piping and gravel would be covered with three feet of growth media and revegetated. Cover and draindown modeling is discussed further in the Technical Memorandum for Cover and Draindown Modeling (SRK, 2015c). Revegetation of the HLP would be carried out following the growth media placement.

Reclamation of the Process Solution Pond and Event Pond

The process solution pond and event pond would be converted to E- or ET-cells to store and remove (by evaporation) post-closure heap draindown. Prior to being converted to E- or ET-cells, the pond solids would be analyzed through the MWMP. Depending on the test results, the solids would be stabilized in place or removed to the top of the HLP before the cover is placed on the heap. Draindown to the E-or ET-cells from the HLP is discussed further in the Technical Memorandum for Cover and Draindown Modeling (SRK, 2015c).

Reclamation of Open Pits

MMI would close its open pits in a manner that is protective of the public safety, consistent with NAC 519A.250.5 and Nevada Assembly Bill 346 (State of Nevada, 2013). During operations, the existing south pit at Gold Ridge would be backfilled with the waste from the upper benches of the new Gold Ridge north pit (**Figure 2.2-9**). Additionally, MMI may also backfill portions of the Gold Pick pit and Cabin Creek pits.

Physical barriers (berms) would be constructed of non-acid-generating native soil and rock to restrict access to the remaining pits. These berms would be placed along a 50-foot set-back distance from the final pit perimeters and constructed to a minimum height of four feet with 2H:1V side slopes. Where potential instability of pit walls may compromise the effectiveness of a berm segment, the berm would be located in a stable area with a set-back distance from the edge of the pit that may be greater than 50 feet. The berms would be revegetated to further stabilize berm slopes and minimize erosion. Warning signs would be posted as appropriate around the perimeter of the pits to further discourage human traffic.

The formation of pit lakes at the Project is not anticipated. As such, the closed open pits at the Project would not be subject to the proposed reclamation regulation changes in response to passage of Assembly Bill 346, which would require mining operations to provide for at least one point of public, non-motorized access to the water of a pit lake that would have a predicted filled surface area of more than 200 acres.

In accordance with NAC 519A.250, MMI would request in writing that the NDEP-BMRR grant an exemption to the requirement for reclamation of open pits which are not backfilled during operations, and rock faces which may not be feasible to reclaim. If the NDEP-BMRR determines that reclamation is not feasible for specific open pits and/or rock faces, then the NDEP-BMRR shall exempt these features from the requirement for reclamation as per NAC 519A.010 to 519A.415.

Measures to Minimize Sediment Loading to Surface Waters

Precipitation and snowmelt would result in runoff from the WRDAs and roads. Surface water management and erosion control measures discussed in Section 2.2.8 would continue to be implemented during construction, operations, and reclamation to control run-on from up-gradient areas to the extent necessary, and control runoff and sedimentation from WRDAs and slopes where such controls may be necessary. BMPs would include, but would not be limited to:

- Erosion and sediment control structures such as diversions (e.g., runoff interceptor trenches, check dams, or swales), siltation or filter berms, filter or silt fences, filter strips, sediment barriers, and/or sediment basins;
- Collection and conveyance structures, such as rock-lined ditches and/or swales;
- Vegetative soil stabilization practices such as seeding, mulching, and/or brush layering and matting;
- Non-vegetative soil stabilization practices such as rock and gravel mulches, jute, and/or synthetic netting;
- Slope stabilization practices such as slope shaping, and the use of retaining structures and riprap; and
- Infiltration systems such as infiltration trenches and/or basins.

MMI would evaluate and customize stormwater and erosion and sediment control measures, as appropriate, based on site-specific conditions encountered during mining and concurrent reclamation.

Disposition of Structures and Material

Buildings and support facilities would be reclaimed during the closure period. Buildings and support structures necessary for the reclamation of the HLP and processing facilities would remain until these facilities are closed and reclaimed. The main procedures for facility and building

decommissioning, site demolition and equipment, and material salvage are briefly summarized below:

- Mine facilities, conveyors, crushers, offices, shops, and other infrastructure would be demolished (disassembled), removed (salvaged) or hauled to solid or hazardous waste landfills, as appropriate;

- Equipment, tanks, and ponds in contact with process reagents would be properly rinsed. The rinse water would be added to the HLP process circuit for final volume reduction and disposal;

- Following decontamination, demolition, and salvage of facilities, soil and fill materials would be visually inspected for spills and sampled, as necessary, to determine the type and extent of petroleum and/or solvent contamination. If present, and based on the type and extent of petroleum and/or other contamination, remedial plans would be developed in coordination with the BLM and NDEP. Material that cannot be treated in situ (i.e., in its original place) would be excavated to the extent of soil contamination and disposed of in an off-site solid or hazardous waste landfill, as appropriate;

- Concrete foundations would be broken up to allow water drainage and covered with a minimum of three feet of rock fill;

- Pond liners would be cut and folded into the pond prior to regrading;

- Reagents and explosives would be removed for use as product at other operations, or appropriately disposed of;

- Surface pipelines would be removed and salvaged. Culverts and pipelines located more than three feet below the ground surface would have their openings plugged with concrete or other suitable materials and buried in place;

- Materials removed from the site would be recycled, reused, or disposed of in a manner consistent with local, state, and federal regulations;

- Power lines associated with the plant, mine, and well field would be removed once power is no longer needed during closure and reclamation activities; and

- Fences excluding wildlife, wild horses, and livestock that would not be required after operations and would be removed.

Reclamation Schedule

The estimated time to complete reclamation assumes average precipitation occurs during the years following reseeding. Periods of drought could delay revegetation, while excessive precipitation could increase draindown time for the HLP. With the exception of monitoring, reclamation activities are expected to be completed within approximately six years following cessation of mining and residual leaching on the HLP.

Monitoring and Maintenance

During operations, annual qualitative monitoring of key indicators of site stability of concurrently reclaimed areas would be conducted. These key stability indicators may include vegetation,

surface erosion, sedimentation, and slope stability parameters. If specified performance guidelines are not satisfied, then appropriate maintenance activities would be implemented. Following completion of concurrent reclamation activities, and until such time that a final bond release is attained, maintenance activities would occur as necessary to satisfy performance guidelines. Maintenance activities may include one or more of the following:

- Sediment removal from sediment ponds, stormwater drainage channels, and diversions as necessary to maintain their design capacity until no longer required;
- The function of temporary erosion control BMPs such as silt fences and straw bales would be maintained. These BMPs would be removed when no longer essential for erosion control;
- Diverting surface water away from reclaimed areas where erosion jeopardizes attainment of reclamation standards;
- Stabilization of rills, gullies, other erosion features or slope failures that have exposed mine waste;
- Noxious weed control; and
- Reseeding or re-application of reclamation treatments would occur in areas where determined through monitoring and agency consultation that reclamation has not yet met reclamation standards.

Quantitative reclamation monitoring to measure compliance with the revegetation success criteria would begin prior to construction to first establish reference areas and existing vegetation communities and then during the first growing season after concurrent and/or final reclamation has been completed and would continue for a minimum of three years or until the reclamation success criteria are achieved. Qualitative monitoring of key indicators of site stability would continue, and the reclamation performance management guidelines would apply during this time. The bond release criteria, which is described in the Conceptual Reclamation/Revegetation Plan for the Gold Bar Project Waste Rock Dumps (Cedar Creek, 2016), would be applied to the data collected in the third year following reclamation. Data from previous years would be used to determine the management needs. Revegetation success would be determined based on monitoring and through coordination with the BLM.

MMI would submit an annual report on or before April 15 of each year to the BLM and NDEP for the preceding calendar year. The annual report would contain descriptions of the reclamation activities completed during the previous year. The annual report would also include a summary of areas reclaimed and a discussion of the general vegetation performance, surface erosion status, slope stability status, and corrective actions completed and/or proposed. The annual report would also serve as documentation for release of reclaimed acreage that meets the bond release criteria.

Post-Closure Monitoring and Maintenance

The BLM would create a Long-Term Funding Mechanism (LTFM) to assure completion of long-term post-closure monitoring and mitigation obligations (after reclamation and financial guarantee release) of MMI for the Project. The LTFM would be reviewed annually during the operation phase of the Project and potentially increased to meet the monitoring and mitigation needs associated with the Project. There is a potential for additional monitoring and maintenance tasks to be required beyond the 13-year post-closure timeline that is currently not included in the reclamation cost estimate. Financial assurance for these tasks would be provided outside of the reclamation financial guarantee by means of the LTFM. Based on future monitoring and evaluation, additional mitigation measures and funding requirements can be implemented at any time if conditions warrant. MMI would remain financially responsible for any additional mitigation that might be required.

Areas Not Subject to Reclamation

Surface features not subject to reclamation include some of the pits and stormwater diversions around the HLP. Additional details (including the draindown curve) are in the WPCP, Appendix I (MMI, 2016b). The process pond and event ponds would be converted to E- or ET-cells and would remain on the landscape as these features. Access roads would remain until reclamation has been released at which time the BLM would determine if access roads are necessary to provide public access consistent with post mining land use. Surface facilities and roads that would remain as post-reclamation features within the Project area are shown on **Figure 2.2-16**. **Table 2.2-18** provides details on the facilities that would remain as post-reclamation features. **Table 2.2-19** provides a comparison of existing and proposed disturbance within the Plan boundary.

Table 2.2-18 Facilities Remaining as Post-Reclamation Features

Facilities Not Reclaimed	Unreclaimed Disturbance (acres)
Pits	139
Ponds	3
Roads[1]	10
Stormwater Diversion Channels[2]	2
Total	**154**

[1] Road would be reclaimed to 12-foot running surface.
[2] Stormwater Diversion Channels would be approximately 12 feet in width, including slopes.

Table 2.2-19 Existing and Proposed Mining Disturbance Comparison

Existing Disturbance within the Plan Boundary (Public and Private Acres)	Existing Disturbance within the Plan Boundary Incorporated into the Proposed Mine Disturbance (Public and Private Acres)	Existing Authorized Exploration Operations (Public Acres)	Proposed Disturbance (Public and Private Acres)	Existing Disturbance within the Plan Boundary Not Incorporated into Project Operations (Public and Private Acres)	Additional Existing Non-MMI Disturbance within Plan Boundary to be Reclaimed by MMI (Public and Private Acres)
654	395	16	718	259	25

2.2.20 Applicant Committed Environmental Protection Measures

MMI would commit to the following EPMs along with those previously identified as part of the Proposed Action to prevent UUD during the life of the Project. These practices, described below, are derived from the general requirements established in the BLM's surface management regulations at 43 CFR 3809 and NDEP-BMRR mining reclamation regulations, as well as other water regulations and BLM guidance documents. These measures are to be considered part of the Plan.

General Applicant Committed Environmental Protection Measures

- Speed limits would be posted at 35 miles per hour (mph) on haul roads and 45 mph on access roads.

- Speed limits within the open pits and inside fenced process areas would be based on site-specific safety requirements and would be set based on factors such as ramp slopes, ramp widths, and curve radius.

- New hire and annual refresher training for all employees and contractors would include wildlife protection training that specifically addresses the commitment of MMI to implement the faunal protection program. MMI would work with NDOW in the development of training materials.

- Site-specific training would also include internal contact numbers for reporting sick or injured animals in the Project area, as well as reporting procedures to the BLM and NDOW for any wildlife and wild horse mortalities. NDOW Industrial Artificial Pond Permit requirements would include reporting by the next business day any mortalities of wildlife species protected under the Migratory Bird Treaty Act, all game animals, game birds, sensitive, threatened or endangered species, and which are associated with chemical-containing tanks or impoundments.

- MMI would install an eight-foot-tall, wildlife exclusion perimeter fence around all open waters to prevent access by larger terrestrial wildlife, wild horses, and other ungulates. The minimum standard fence would be eight feet high, the bottom four feet of which would be composed of woven or mesh wire should be no greater than two-inch mesh on the bottom two feet and a maximum of eight-inch mesh on the top. The bottom would be placed tight to the ground level to prevent animals from securing access under the fence. The remainder of the fence above the woven or mesh wire would be smooth or barbed wire with a spacing of 10 inches, 12 inches, 12 inches and 14 inches beginning from the top of the woven or mesh wire. If cyclone or chain-link fence is to be used then the only conditions to be met are the eight-foot height and tight to the ground. These fences would be inspected and maintained to preclude wildlife access.

- Fences in the process area would be continuous, with no breaks, except for gates, that would be kept closed; and smooth or barbed wire would be used above the top horizontal portion of fencing to discourage perching.

- All lined ponds would be constructed with escape ramps consisting of textured liner to assist in a safe footing during egress, should any wildlife manage to gain access and inadvertently fall into one of the ponds.

- Leach lines on the HLP would be managed to preclude surface ponding on the heap surface that could attract avian or terrestrial resources to potentially toxic leach solutions.

- Hazardous material storage would include secondary containment to preclude contamination of surface or groundwater resources that animals could access.

- Drill pad siting would provide for topography to help shield noise within the “maximum footprint area” for a given site.

- MMI would consider obtaining a Raven Depredation Permit from United States Fish and Wildlife Service (USFWS) or submit for coverage under an NDOW permit.

- During all phases of the Project, all food, waste, and other trash would be placed in closed containers.

- MMI would prohibit employees, contractors, and sub-contractors from feeding wildlife or wild horses, or making food available for scavenging wildlife.

Air Quality

- A fugitive dust control program would provide for water application on haul roads and other disturbed areas; chemical dust suppressant application (such as Lignin sulfate or magnesium chloride) where appropriate; and other dust control measures.

- Disturbed areas would be seeded with an interim seed mix to minimize fugitive dust emissions from unvegetated surfaces where appropriate.

- Dust generated from the use of roads and excavation activities would be minimized to the extent reasonable and practicable by using BMPs such as minimizing vehicular traffic, and using prudent vehicle speeds. Fugitive emissions in the process area would be controlled at the crusher, and conveyor drop points through the use of bag houses and/or water sprays, where necessary. Other process areas requiring dust and/or emission controls would include the cement/lime silos, ADR Plant, the various ancillary screening and sizing processes, agglomerator, refinery, generators, and the laboratory. Appropriate emission control equipment would be installed and operated in accordance with an NDEP-issued Air Quality Operating Permit.

- Equipment and machinery would be maintained in good working condition to minimize emissions.

Water Resources

- Process components would be designed, constructed, and operated in accordance with NDEP regulations and include engineered liner systems.

- The proposed process facilities would be zero-discharge, and the heap leach ponds would have an engineered liner and leak detection systems in accordance with NAC 445A design criteria.

- MMI would follow the Waste Rock Management Plan that documents the procedures for the handling and management of Designated Waste to minimize potential oxidation and solute generation along with monitoring and reporting procedures.

- MMI would implement the Water Management Plan in compliance with 43 CFR 3809.401(b)(2)(iii) (included in the Plan). This plan identifies more specific control measures and monitoring requirements. MMI would sample groundwater on a quarterly basis from three monitoring wells located within the perimeter of the site's process facilities. Groundwater sampling would be conducted using NDEP and EPA approved sampling methodologies. Water purged from the well during sampling would be managed at the well head. All groundwater purged from wells within the process area would be managed within the process area.

- All artificial or man-made bodies of water that contain any chemical in solution at levels lethal to wildlife (e.g., barren and pregnant solution ponds) would be covered or contained in a manner that would prevent access by birds and bats. All covers or containers would be maintained in a manner that would continue to preclude access by wildlife for as long as the pond or container can hold water. Any chemical-laden fluids that are the result of any process and that are impounded in a pond that is too large to cover or contain (e.g., mill tailings ponds) would be rendered non-lethal to wildlife. The chemical concentration would be measured at a non-lethal level at the point where the fluid flows from a pipe into the pond or open conveyance system. Chemical neutralization and dilution are among methods that could be used to reduce chemical concentration.

Erosion and Sediment Control

BMPs would be used to limit erosion and reduce sediment in precipitation runoff from Project facilities and disturbed areas during construction, operations, and initial stages of reclamation.

Because there are no waters of the U.S. (WOUS) in or around the Project area (JBR, 2012a), MMI would not be specifically required to manage stormwater discharges in accordance with provisions set forth in the NDEP Stormwater General Permit NVR300000, nor would MMI be required to submit a Stormwater Pollution Prevention Plan to the NDEP. However, MMI would adhere to the policies and guidelines set forth in NVR300000 to ensure that appropriate stormwater BMPs are employed at the Project site. As per NVR300000, BMPs for the Project would include "erosion and sediment controls, conveyance, stormwater diversions, and treatment structures, and any procedure or faculty used to minimize the exposure of pollutants to stormwater or to remove pollutants from stormwater." Specific BMPs would include, but would not be limited to:

- Erosion and sediment control structures such as diversions (e.g., runoff interceptor trenches, check dams, or swales), siltation or filter berms, filter or silt fences, filter strips, sediment barriers, and/or sediment basins.

- Collection and conveyance structures, such as rock-lined ditches and/or swales.

- Vegetative soil stabilization practices such as seeding, mulching, and/or brush layering and matting.

- Non-vegetative soil stabilization practices such as rock and gravel mulches, jute, and/or synthetic netting.

- Slope stabilization practices such as slope shaping, and the use of retaining structures and riprap.

- Infiltration systems such as infiltration trenches and/or basins.

Following construction activities, areas such as cut and fill slopes and embankments and growth media/cover stockpiles would be seeded as soon as practicable and safe. Concurrent reclamation would be maximized to the extent practicable to accelerate revegetation of disturbed areas. All sediment and erosion control measures would be inspected, and maintenance/repairs performed, as needed.

Migratory Birds and Raptors

- To comply with the Migratory Bird Treaty Act (MBTA), no new surface disturbance would occur during the migratory bird breeding season (March 1 through July 31 for raptors, and April 1 through July 31 for other avian species). If surface disturbing activities are unavoidable during the migratory bird breeding season, a nest survey would be conducted by a BLM-approved, qualified avian biologist prior to any surface disturbing activities in order to avoid potential impacts to breeding migratory birds. Pre-disturbance surveys for migratory birds are only valid for 14 days. If the disturbance for the specific location does not occur within 14 days of the survey, another survey would be conducted. If active nests or burrows are located around the Project area, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nest material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) would be delineated and the buffer area avoided to prevent destruction or disturbance to nests or birds until they are no longer actively breeding or rearing young. The site characteristics to be used to determine the size of the buffer area are: 1) topographic screening; 2) distance from disturbance to nest; 3) the size and quality of foraging habitat surrounding the nest; 4) sensitivity of the species to nest disturbances; and 5) the protection status of the species.

- Annual raptor surveys would be conducted for the Plan boundary and a two-mile buffer. The survey would be performed in accordance with the USFWS *Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance* (Pagel et al., 2010). This guidance states that a project should be surveyed at least twice for nesting raptors during the breeding season and that surveys should be conducted at least 30 days apart. If nesting building activities or behavior or nesting raptors are identified, MMI would coordinate with the BLM biologist on appropriate avoidance distances, as determined by the species identified. The avoidance areas would be in place until a qualified biologist has determined the young have fledged.

Greater Sage-Grouse

- Flight diverters would be installed on any fencing within 3.1 miles of a lek using the Natural Resources Conservation Service (NRCS) Fence Collision Risk Tool, or other appropriate analysis to determine best locations for diverters.

- Generators would include enhanced generator silencing packages which includes high ambient and sound-attenuated enclosures, use of noise absorbent materials, and an internal exhaust silencer system.

- Berms would be constructed along the haul roads in conformance with MSHA requirements that would also assist in the attenuation of noise along the haul roads.

- A blasting plan has been developed and included in the Plan to specifically limit blasting during atmospheric conditions (inversions) that could propagate blasting noise beyond the mine area.

- A Noxious Weed Plan has been developed and included in the Plan to prescribe methods to prevent and control the spread of noxious weeds during and following construction of the Gold Bar Mine Project.

- A reclamation/revegetation plan has been developed and included in the Plan for the Project high elevation waste rock dumps to specifically address the unique challenges resulting from the edaphic, geologic, and physiographic conditions of the area. The revegetation plan is specifically focused on the development of sage grouse habitat in areas that were either previously disturbed and unreclaimed or woodland dominated.

- New hire and annual refresher training for all employees and contractors would include greater sage-grouse specific protection training that specifically addresses the commitment of MMI to implement the protection program and the need for all employees to avoid harassment and disturbance of greater sage-grouse, especially during the breeding season. MMI would work with NDOW in the development of training materials.

- Any overhead power lines within four miles of active and pending active leks would be constructed with anti-perching devices, where applicable. Actions would be completed in consideration of the latest Avian Power Line Interaction Committee guidelines with assistance of BLM and NDOW for the appropriate predatory bird anti-perching devices.

- Hazardous material storage would include secondary containment to prevent contamination of surface water or groundwater resources that animals could access.

- Travel timing restrictions would be implemented during lekking season (March 1 – May 15) on Three Bars Road and Roberts Creek Road, from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM. Emergency and local traffic would be exempt from these restrictions.

- Access road work, road maintenance-related work, gravel pit work conducted by MMI within four miles of an active or pending lek are subject to timing restrictions during lekking season (March 1 – May 15) from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM.

- MMI would conduct lek attendance monitoring, following NDOW monitoring protocols, for all leks within a two-mile distance of Three Bars and Roberts Creek access roads. Specific triggers would be developed with the BLM and NDOW tied to declining numbers that cannot be accounted for by normal variation and action items to further prevent impacts to sage-grouse populations. Leks found to be unoccupied after three successive years of monitoring would be proposed to the BLM and NDOW to be designated as inactive, and monitoring of those leks would be suspended. If no adverse impact to active leks is demonstrated after five years of monitoring, MMI would be able to request suspension of all lek monitoring.

Burrowing Owls

- If surface disturbance is to occur during the raptor nesting season, burrowing owl pre-construction surveys would be conducted prior to ground disturbing activities. If occupied burrows are encountered, an avoidance buffer would be placed around the burrow to avoid adverse impacts. MMI would coordinate with the BLM to determine the appropriate avoidance buffer and the appropriate additional measures if removal of the burrow is necessary.

Pygmy Rabbits

- Pygmy rabbit pre-construction surveys would be conducted prior to ground disturbing activities. If occupied burrows/colonies are encountered, consultation with the BLM to determine the appropriate avoidance buffer. If removal of the burrow/colony is required, other measures would take place, MMI would coordinate with the BLM to determine the appropriate measures.

General Wildlife

- Established mule deer trails would be identified by a BLM qualified biologists, and warning signs would be posted at appropriate locations along the haul roads to warn drivers of crossing points.

Wild Horses

- New hire and annual refresher training for all employees and contractors would include wild horse protection training that specifically addresses the commitment of MMI to implement the protection program. MMI would work with BLM in the development of training materials.

- Site-specific training for the mining and processing areas would include the protection measures specifically developed for each work area that would also include internal contact numbers for reporting wild horse sightings in the Project area as well as reporting procedures to BLM for wild horse mortalities or injuries, should they occur.

- Established wild horse trails would be identified by a BLM-qualified specialist or biologist, and warning signs would be posted at appropriate locations along haul roads, pit, and waste rock dump access roads to warn drivers of crossing points and the potential presence of horses.

- Reflectors specifically designed to reduce wild horse collisions would be placed along haul roads and access roads where necessary. Reflectors would be mounted on posts near the side of the road; when a car passes, light from the headlights would be directed at right-angles and would be seen by the horses as a series of sequential flashing lights, thus startling the horses and causing them to wait until the vehicle passes. Similarly, reflectors may also be placed along the perimeter of active mine areas as necessary to deter access by horses.

- Berms, fencing or other physical barriers would be placed to limit or deter wild horse access to haul roads and open pits in areas of high risk.

- Berms constructed along haul roads would include openings at major trails to encourage road crossing at these locations where signage can warn drivers. Berms would be constructed per MSHA regulations.

- The BLM MLFO Wild Horse Specialist (775-635-4000) would be contacted if any wild horses are observed to be lame or sick, or if foals appear to be orphaned, if any vehicle/wild horse collisions occur, or if dead animals are discovered/observed.

- Wild horse movement through the Project area, when observed by MMI and other site personnel, would be recorded by the Environmental Manager for use in the refinement of engineering and management protection measures during operations.

Livestock

- New hire and annual refresher training for all employees and contractors would include livestock protection training that specifically addresses the commitment of MMI to implement the protection program.

- Site-specific training would also include internal contact numbers for reporting sick or injured animals in the Project area as well as reporting procedures to the local rancher and/or Eureka County Sheriff's office.

- Any siting of livestock in the active mine area would be reported internally, and a notification of the local ranch to move the livestock from the active mine areas would be made.

- Established livestock crossing locations would be identified by a BLM-qualified specialist or biologist, and warning signs would be posted at appropriate locations along haul roads, pit, and waste rock dump access roads to warn drivers of crossing points and the potential presence of livestock.

Cultural Resources

When possible, MMI would practice avoidance of eligible cultural resources or unevaluated cultural resources. If avoidance is not possible, or is not adequate to prevent adverse effects, MMI would undertake prescribed data recovery from such sites. Development of a Historic Properties Treatment Plan (HPTP), 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 could not 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 Nevada State Historic Preservation Office, no further cultural work would be performed. If a site meets eligibility criteria, a data recovery plan or appropriate mitigation would be completed.

If previously unidentified cultural resources are discovered or an unanticipated impact situation occurs, all project-related activities within 100 meters (or approximately 328 feet) of the discovery/impact would cease immediately and MMI would secure the location to prevent vandalism or other damage, and would notify the BLM Authorized Officer immediately. Activity at the location would be suspended until after the discovery has been evaluated, any necessary EPMs are completed and the BLM Authorized Officer has issued a written Notice to Proceed.

Paleontological Resources

Paleontological resources constitute a fragile and non-renewable scientific record of the history of life on earth. Although no paleontological resources are known or identified in the immediate area, this Project may have an unintended adverse effect on such resources. MMI notes that fossils are not part of the mineral estate. Paleontological resources are protected by the Paleontological Resources Protection Act (OPLA-PRP: Omnibus Public Land Management Act of 2009 Paleontological Resources Preservation Subtitle 123 Stat. 1172, 16 U.S.C. 470aaa et seq.) which establishes criminal and civil penalties. MMI is aware that if paleontological resources are found in direct association with cultural resources, then such occurrences are subject to

Archaeological Resource Protection Act (ARPA: 43 CFR 7.4, 7.14, 7.15, 7.16) provisions. The Paleontological Resources Protection Act requires that the nature and location of paleontological resources on public lands be kept confidential. If paleontological resources are discovered, MMI would cease operations in the vicinity of the discovery and ensure adequate protection to the discovery, then notify the BLM immediately, by telephone, with written confirmation to follow. Notification should be made to Authorized Officer, MLFO, 50 Bastian Road, Battle Mountain, NV, 89820, (775–635–4000). No activity in the vicinity of the discovery would resume until MMI has been issued a Notice to Proceed by the BLM Authorized Officer.

If vertebrate fossils are encountered during any phase and any area of the Plan, work would immediately stop within 50 feet of the locality and the BLM would be immediately notified. Work would not resume until a Notice to Proceed is issued by the BLM Authorized Officer.

If MMI submits an amended Plan that proposes to disturb the un-inventoried area which contains the Devils Gate geological formation (which is known to host invertebrate fossils), a paleontological inventory would be conducted by a qualified individual and the report provided to MMI and the BLM for review.

Public Safety and Accessibility

Public safety would be maintained throughout the life of the Project and all equipment and facilities would be maintained in a safe and orderly manner. To protect public safety, all activities would be conducted in conformance with applicable federal and state health and safety requirements.

Visual Resources

To protect visual resources, MMI would apply the following measures throughout the life of the Project:

- Light fixtures would be placed at the lowest practical height and would be directed to the ground and/or work areas to avoid being cast skyward or over long distances.
- Light fixtures would incorporate shields and/or louvers, where possible, and be full cut-off type.
- Buildings would be painted or stained to produce flat-toned, non-reflective surfaces using the BLM color chart for color selection.
- The use of dimmers, timers, and motion sensors would be installed where appropriate.
- Fugitive dust would be minimized in order to reduce “sky glow,” by reducing the light reflectance from the dust particles.

Protection of Survey Monuments

To the extent practicable, MMI would protect all survey monuments, witness corners, reference monuments, bearing trees, and line trees against UUD or damage. If, in the course of operations, any monuments, corners, or accessories are destroyed, MMI would immediately report the matter to the Authorized Officer. Prior to destruction or damage during surface disturbing activities, MMI

would contact the BLM to develop a plan for any necessary restoration or re-establishment activity of the affected monument.

Human Health and Safety

Within the mine and process areas, vehicular traffic and human activities would comply with all applicable MSHA requirements and BMPs.

Fire Protection

As specified by MSHA, MMI would institute a fire protection training program and would have a rehearsed fire suppression plan. A fire protection system would be installed that would incorporate Eureka County and State of Nevada code requirements in the administration and warehouse complexes, truck shop, crushing plant, and process plant. A 250,000-gallon fresh water/fire water tank would be located above the ADR plant, on the south side of the HLP to provide adequate water pressure for the operations and fire suppression system. A rangeland fuel break would be constructed around the facilities. Water trucks, used for dust suppression, would be available in the event of a fire. MMI would promptly comply with any emergency directives and requirements of Eureka County and the BLM pertaining to industrial operations during the fire season.

Light vehicles traveling outside of the main mining areas and along roads that traverse vegetated rangeland during fire season would carry a small water supply in order to control sparks that may be generated by exhaust. Vehicle catalytic converters would be inspected often and cleaned of all brush and grass debris.

When conducting welding operations, they would be conducted in an area free of or mostly free of vegetation. A minimum of 10 gallons of water and a shovel would be on hand to extinguish any fires created from the sparks. Extra personnel would be at the welding site to watch for fires created by welding sparks.

Invasive, Non-native Species

MMI recognizes the economic and environmental impact that may result from the establishment of noxious weeds and has committed to a proactive approach to weed control. The following weed control measures would be implemented.

- A noxious weed survey would be completed prior to any earth moving disturbance. Areas of concern for noxious weeds would be flagged by a weed specialist or qualified biologist to alert all personnel to avoid those areas, as practicable.
- Information and training regarding noxious weeds management and identification would be provided to all personnel affiliated with the implementation and maintenance of the Project.
- The Adaptive Noxious Weed Plan for the Project (included in the Plan) would be implemented during construction and operations. The plan contains a risk assessment, management strategies, provisions for annual monitoring and treatment evaluation, and provisions for treatment. The results from annual monitoring would be the basis for updating the plan and developing annual treatment programs.

- All vehicle and heavy equipment that may have been exposed to noxious weeds would be cleaned with a power or high-pressure washer prior to entering or leaving the Project mine boundary. Vehicle cleaning would minimize the transport of vehicle-borne weed seed, roots, or rhizomes.

- To minimize the transport of soil-borne noxious weed seeds, roots or rhizomes infested soils or material would be stockpiled adjacent to the areas from which they were stripped. Appropriate measures would be taken to avoid wind or water erosion of the affected stockpile.

- All interim and final seed mixes, hay, and straw products would be certified weed-free.

- Weed monitoring would be conducted for the life of the operation or until the site is released and the reclamation financial surety is released. If the spread of noxious weeds is noted, weed control procedures would be determined in consultation with BLM personnel and would be in compliance with BLM handbooks and applicable laws and regulations.

- Mixing of herbicides and rinsing of herbicide containers and spray equipment would be conducted only in areas that are a safe distance from environmentally sensitive areas and points of entry to bodies of water (storm drains, irrigation ditches, streams, lakes, or wells).

Solid and Hazardous Waste Management

Employee training would be implemented to include appropriate disposal practices such as the allowable wastes that can be disposed of in the on-site landfill, management of used filters, oily rags, fluorescent light bulbs, aerosol cans, and other regulated substances. MMI would maintain the disposal site and leave it in a clean and safe condition. MMI would not allow burning at the site without prior approval. Used solvent, liquids drained from aerosol cans, accumulations of mercury lights and used antifreeze would be handled pursuant to the Resource Conservation and Recovery Act (RCRA).

MMI would take measures to isolate, control, and properly dispose of toxic and hazardous materials, and not drain oil or lubricants onto the ground surface. Hazardous materials would be stored in separate containers to prevent mixing, drainage, or accidents. Petroleum products such as gasoline, diesel fuel, and lubricants would be stored in approved containers.

Fuel and oil for diesel and gas powered equipment would be stored in above-ground, sealed tanks generally in the processing facilities area. The tanks would be installed in lined secondary containments designed to hold 110 percent of the contents of the largest vessel in case of rupture. Surface piping would lead from each tank to the fuel dispensing area. The refueling hoses would be equipped with overflow prevention devices and secondary containment. Hazardous wastes would be managed in a designated storage area prior to their shipment to an off-site licensed disposal facility (per federal, state, and local RCRA regulations).

Regarding spills, MMI would ensure that spills under 25 gallons are immediately cleaned up, and spills over 25 gallons are cleaned up as soon as possible and reported to the BLM and NDEP. Spills would be cleaned up in accordance with NDEP guidelines.

Potential reagent spills would be controlled with secondary containment in the reagent mixing and storage areas. The ADR building would have a sealed concrete secondary containment foundation. A floor sump pump would be used to return any spilled material either to the appropriate storage tank or into the leach circuit, as appropriate. Safety Data Sheets (SDS) for the reagents would be readily available, in accordance with MSHA's Hazard Communication for the Mining Industry (30 CFR 47).

Soil Erosion

- The surfaces of the growth media stockpiles would be shaped after construction with overall slopes of 3H:1V to reduce erosion.
- To further minimize wind and water erosion, the growth media stockpiles would be seeded after shaping with an interim seed mix developed in conjunction with the BLM.
- Diversion channels and/or berms would be constructed around the growth media stockpiles, as needed, to prevent erosion from overland runoff.
- BMPs such as straw wattles or staked straw bales would be used as necessary to contain sediment liberated from direct precipitation.

2.3 Alternatives to the Proposed Action

The need for a wide, objective review of potential alternatives stems from 40 CFR 1500.2(e), which states that the NEPA process must, "identify and asses the reasonable alternatives to proposed actions that would avoid or minimize adverse effects of these actions upon the quality of the human environment," and also as directed under 40 CFR 1501.2(c) which states that agencies need to, "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved resource conflicts concerning alternative uses of available resources...".

The alternatives proposed for detailed analysis in this EIS meet the following criteria of a "reasonable alternative".

- Consistent with the Purpose and Need and is needed to address one or more issues;
- Technically and economically practical and feasible using common sense; and
- Environmentally reasonable, i.e., would not be obviously environmentally inferior to other action alternatives.

Based on the criteria for reasonable alternatives, through internal scoping discussions, and the input from public scoping comments, four alternatives to the Proposed Action were identified for evaluation in this EIS. The four alternatives discussed further in this EIS include the following: 1) No Action Alternative; 2) 25 kilovolt (kV) Overhead Distribution Line Alternative; 3) Three Bars Road/Atlas Haul Road as Only Access; and 4) Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative. Alternatives considered but eliminated from detailed analysis with the reason for their elimination, are described in Section 2.4. All the alternatives considered are summarized in **Table 2.3-1**.

Table 2.3-1 Alternatives Considered and Screening Criteria

Alternative	Consistent with Purpose and Need	Technically Practical and Feasible	Economically Practical and Feasible	Environmentally Reasonable	Carry Through for Full Analysis in the EIS
No Action Alternative	N/A[1]	Yes	Yes	Yes	**Yes**
Proposed Action	Yes	Yes	Yes	Yes	**Yes**
Power Supply Alternatives					
25 kV Overhead Distribution Line	Yes	Yes	Yes	Yes[2]	**Yes**
Diamond Valley Substation	Yes	Yes	Yes	No	No
Diamond Valley West Substation	Yes	Yes	Yes	No	No
Access Alternatives					
Roberts Creek Road as Only Access	Yes	Yes	No	No	No
Three Bars Road/Atlas Haul Road as Only Access	Yes	Yes	Yes	Yes	**Yes**
Mount Hope and North Roberts Creek for Light Vehicle Traffic Alternative	Yes	Yes	Yes	Yes	**Yes**
Mine Features Facilities Alternatives					
Pick South Upper and Lower WRDAs	Yes	No	Yes	No	No
Additional Process Pond	Yes	No	Yes	No	No

[1] The No Action Alternative is required to be evaluated by CEQ regulations (40 CFR 1502.14(d)).
[2] This alternative is environmentally reasonable compared to the other transmission line alignments that were dismissed from full analysis. The EIS analysis would fully evaluate whether this alternative is environmentally reasonable.

2.3.1 No Action Alternative

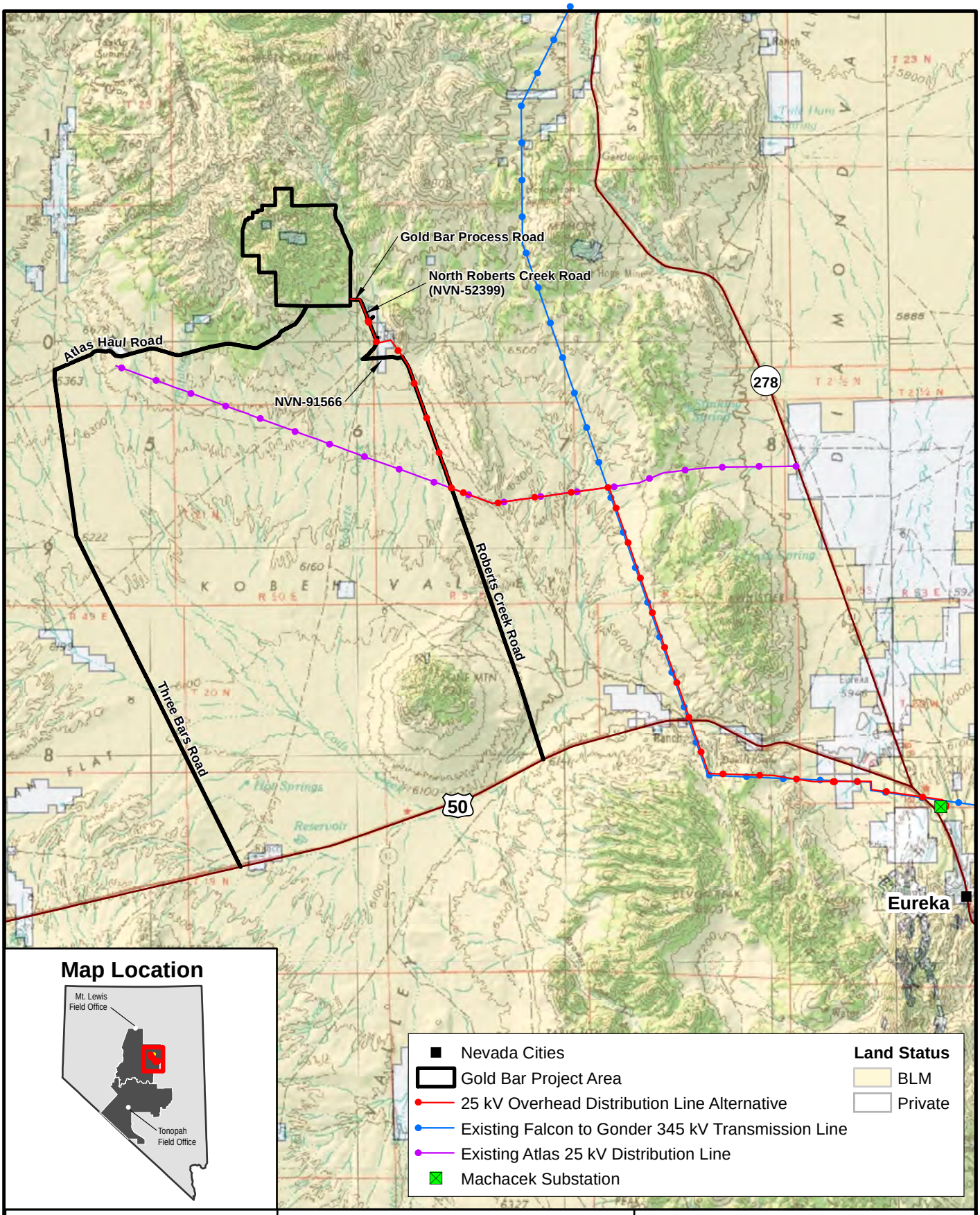
Under the No Action Alternative, the MMI Plan would not be authorized by BLM and the activities described in the Proposed Action would not occur. Mineral resources would remain undeveloped and the construction and operation of the proposed mining and mineral beneficiation facilities would not occur. The 654 acres of existing disturbance from past operations within the Project mine boundary would remain unreclaimed. The reclamation plan associated with the Proposed Action would not be implemented, and no revegetation or recontouring of existing disturbances to match the natural topography would occur. MMI may continue exploration efforts that are already approved.

BLM's lack of approval of the Plan would not directly affect further mineral development on private land and private mineral rights. However, due to the nature of the area and the locations of public lands, development of the private mineral rights would not be feasible without the use of public lands.

Selection of the No Action Alternative would not preclude a future filing of a different Plan of Operations by MMI or any other authorized mineral rights holder to mine these minerals. Any future plans of operations would need to be reviewed by the BLM and addressed in an environmental review (NEPA).

2.3.2 25 kV Overhead Distribution Line Alternative

A 25 kV power distribution line was considered as an alternative means to supply power to the Project, as opposed to the on-site LNG/CNG generators proposed in the Plan (**Figure 2.2-17**). The proposed distribution line would consist of the construction and operation of approximately 24.5 miles of new 25 kV overhead distribution line to supply the needed power for Project operations. The power would be supplied by Mt. Wheeler Power, Inc. (Mt. Wheeler) to whom the necessary BLM right-of-way (ROW) would be granted. The proposed power distribution line would take power delivery at the existing Machacek Substation located 0.2 mile east of U.S. Highway 50 near the town of Eureka, Nevada. The new overhead distribution line would extend from the existing Machacek Substation located on BLM managed lands west, then north adjacent to the existing Falcon-Gonder 345 kV transmission line to the existing Atlas 25 kV overhead distribution line. At this intersection, the proposed new 25 kV overhead distribution line would tap the existing Atlas 25 kV overhead line. From there, the existing line would be utilized for approximately 4.75 miles west to a tap point on North Roberts Creek Road. At this location, a new segment of 25 kV overhead distribution line would extend northwest along North Roberts Creek Road approximately 7.5 miles to the mine site. For the purposes of this EIS, the power distribution line would be a total of approximately 30 miles in length, with five miles of existing power distribution line (Atlas 25 kV line) and approximately 25 miles (approximately 24 miles on public land administered by the BLM and approximately one mile on private land) of new power distribution line. The new overhead distribution line would require minimal facility upgrades at the Machacek Substation, and no additional surface disturbance would be required there. The proposed power distribution line would take approximately six months to construct, and would require an 80-foot wide temporary construction ROW, and a 40-foot wide permanent operation and maintenance ROW.



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1 in = 4 miles

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25 kV OVERHEAD
DISTRIBUTION LINE ALTERNATIVE

FIGURE 2.2-17

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Access to the power distribution line corridor would be through existing roads along the corridor and through existing roads by the Machacek Substation. A centerline access road is proposed in the permanent ROW to provide access during construction and maintenance. Proposed disturbance associated with the power distribution line and access road would occur within the 40-foot permanent ROW and would avoid any impacts to sensitive resources. The typical width for temporary disturbance for new access roads would be 15 feet, and would require 1.82 acres of disturbance per mile of new access road. In areas of steep terrain, the centerline of the road would be staked, and the road built so that there would be approximately 12 feet of travel-way with two to three feet of berm generally on the outer side. Access roads remaining for permanent operation and maintenance of the line would be 10 feet in width, and would require approximately 1.21 acres of disturbance per mile of new access road. Since it is not practical to determine exact pole locations before final design of the distribution line, throughout this EIS it is assumed the entire ROW would be disturbed. This is a conservative estimate of disturbance acreages associated with the distribution line, but would provide a conservative scenario for impacts to resources. Both the 80-foot temporary construction ROW and the 40-foot permanent operation and maintenance ROW include a cultural avoidance area. The 80-foot temporary construction ROW includes approximately 40 acres of cultural avoidance area that would not be disturbed, and the 40-foot permanent operation and maintenance ROW includes approximately 14 acres of cultural avoidance area that would not be disturbed. Total disturbance associated with the 40-foot permanent operation and maintenance ROW (not including the cultural avoidance area) would be 130 acres, with 124 acres of disturbance on BLM administered public land and six acres on private land. Total disturbance associated with the 80-foot temporary construction ROW (not including the cultural avoidance area) would be 246 acres, with 235 acres on BLM administered public land and 11 acres on private land.

This alternative would meet the Purpose and Need but it could not be completed in time to meeting the Project start up schedule. In addition, this alternative would result in additional environmental impacts to sensitive resources since this alternative would disturb 130 additional acres within the 40-foot permanent ROW and 246 acres within the 80-foot temporary ROW, all of which is within greater sage-grouse habitat. According to the Management Direction for Lands and Realty (MD LR 1) in the ARMPA, the first priority is to avoid new disturbance and where this is not feasible the second priority would be to minimize and mitigate any new disturbance. The 25 kV distribution line was originally part of the Proposed Action. However, in order to reduce potential environmental impacts from the distribution line, MMI amended the Proposed Action to provide power at the site using LNG/CNG generators. In order to evaluate whether the alternative is environmentally reasonable, and to fully analyze and compare environmental impacts resulting from power being supplied by LNG/CNG generators versus the overhead distribution line alternative, this alternative was carried through for analysis in the EIS.

2.3.3 Three Bars Road/Atlas Haul Road as Only Access Alternative

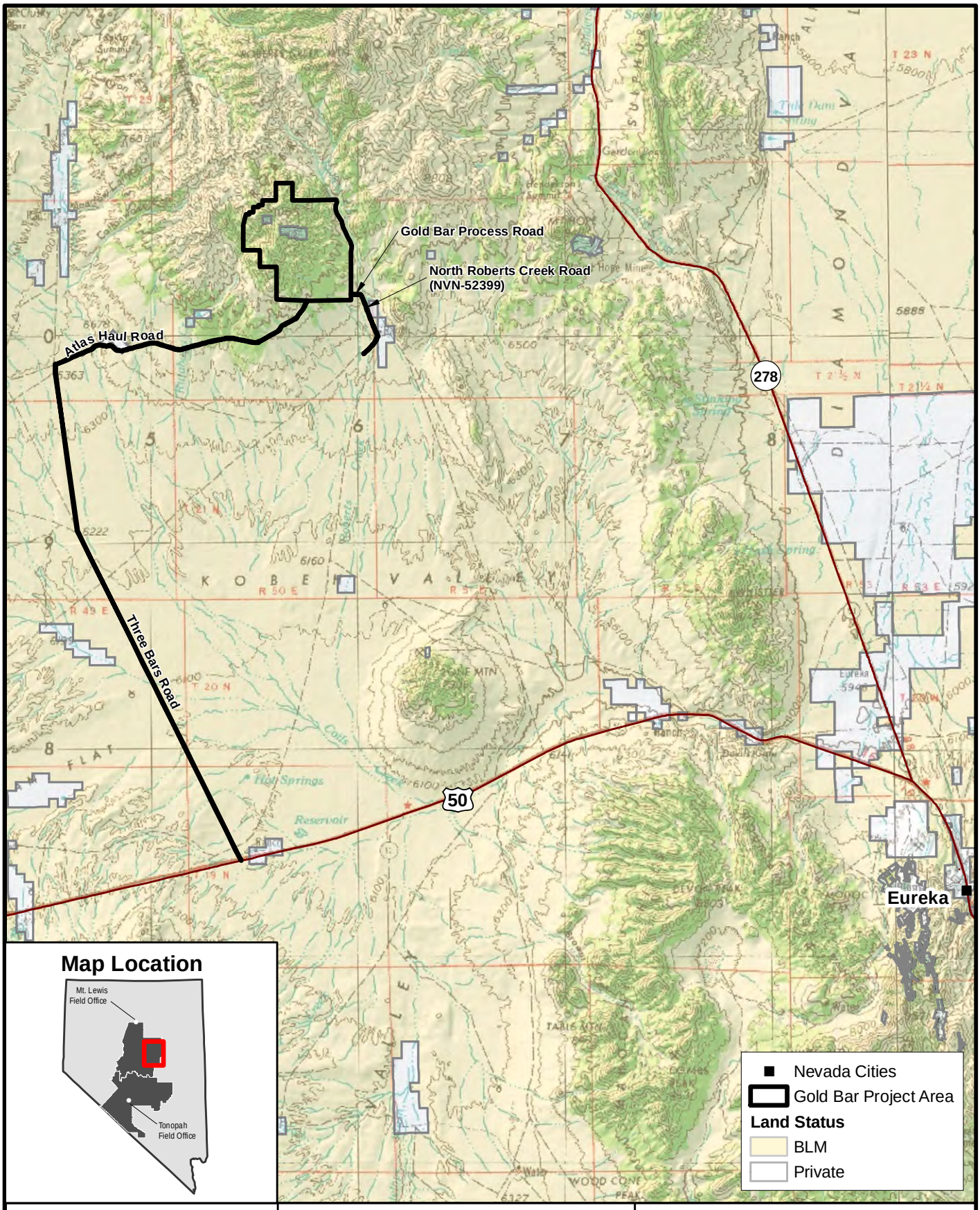
An alternative to the Plan was considered to use Three Bars Road and Atlas Haul Road as the only means of access for both heavy and light vehicle traffic to the Plan boundary (**Figure 2.2-18**). Under this alternative, Three Bars Road and Atlas Haul Road would be the only route used to

access the Project area and mine facilities. There would be no other access. Mine-related traffic under this alternative would be subject to the same seasonal timing restrictions as specified for the Proposed Action, which would consist of seasonal timing restrictions from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. Three Bars Road and Atlas Haul Road would be maintained by MMI. MMI would enter into a cooperative agreement with Eureka County for maintenance activities. No improvements would be made to Three Bars Road or Atlas Haul Road to implement this alternative, and the proposed disturbance would remain the same as the Proposed Action. Under this alternative, North Roberts Creek Road would still be improved to allow for all-weather access along the water pipeline to the wells. This alternative was considered to reduce environmental impacts resulting from using two access routes, particularly impacts to greater sage-grouse leks within four miles of the proposed Roberts Creek Road access route even though the travel distance for light vehicle traffic would increase by 20 miles. There is no change in the amount of surface disturbance compared to the Proposed Action.

This alternative would meet the Purpose and Need of the Project, would be technically feasible, and would be an environmentally reasonable alternative. This alternative was carried through for detailed analysis in the EIS.

2.3.4 Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

An alternative to accessing the mine facilities was considered for light vehicle traffic to use the authorized Mount Hope Access Road and well field road as access to the Plan boundary (**Figure 2.2-19**). This alternative would require light vehicle traffic to use State Route 278 to the Mount Hope Access Road, and then use the Mount Hope well field road to access Roberts Creek Road. The Bypass Road [NVN-91566] and North Roberts Creek Road would be used from that point to access the Plan boundary. Heavy vehicle traffic would use Three Bars Road and the Atlas Haul Road, the same as the Proposed Action. Mine-related traffic under this alternative would be subject to the same seasonal timing restrictions as specified for the Proposed Action, including the Mount Hope access road and well field road, which would consist of seasonal timing restrictions from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. Proposed disturbance for this alternative would be the same as the Proposed Action. All improvements to the Mount Hope Access Road would be within the previously authorized disturbance area for the Mount Hope project. This alternative was considered to reduce environmental impacts resulting from using a longer stretch of Roberts Creek Road for light vehicle traffic, particularly impacts to greater sage-grouse leks within four miles of the proposed Roberts Creek Road access route.



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1 in = 4 miles

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THREE BARS/ATLAS HAUL ROAD AS ONLY ACCESS ALTERNATIVE

FIGURE 2.2-18

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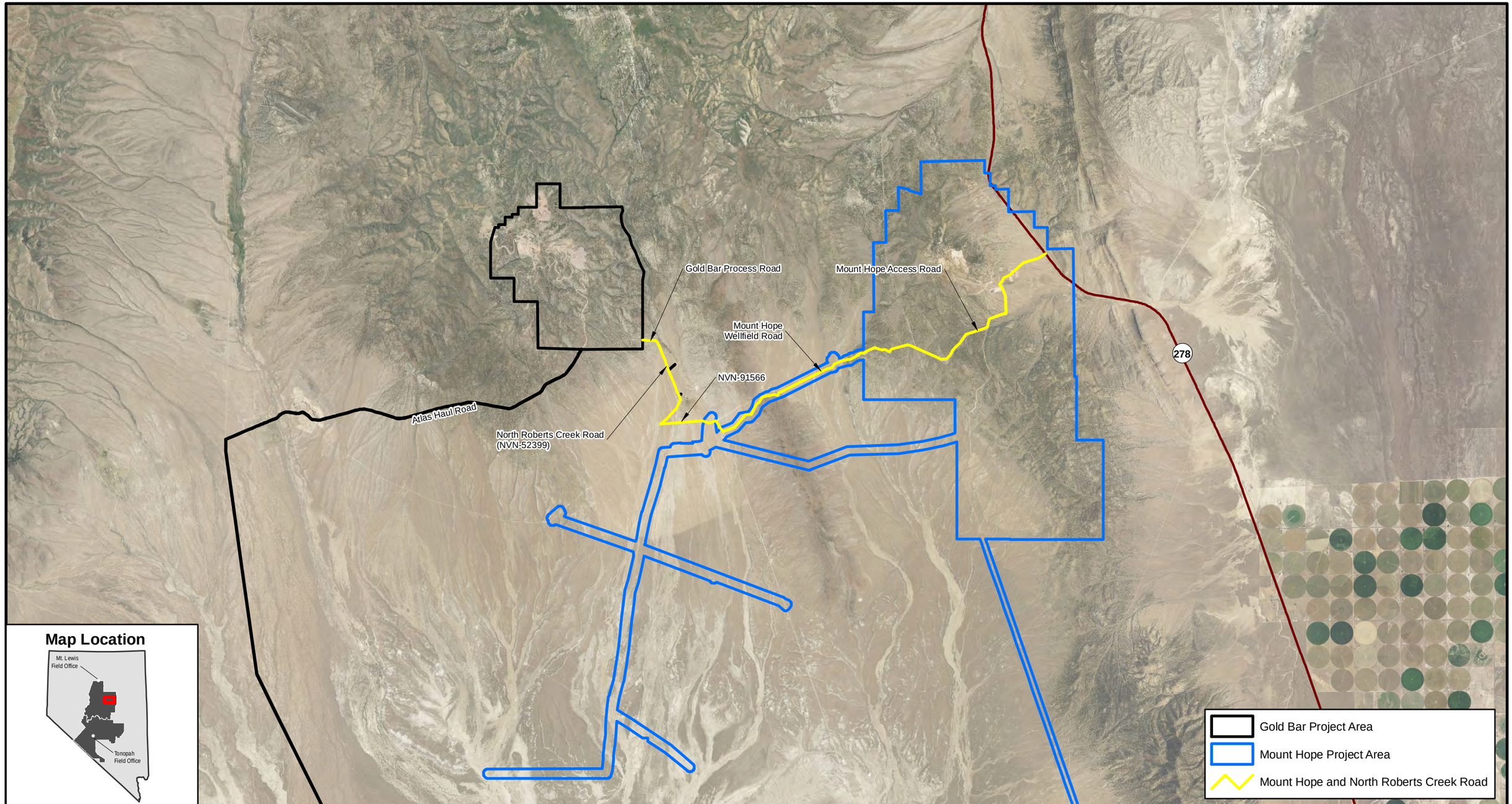

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MOUNT HOPE AND
NORTH ROBERTS CREEK ROAD
FOR LIGHT VEHICLE TRAFFIC ALTERNATIVE

FIGURE 2.2-19

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This alternative would meet the Purpose and Need of the Project, it would be technically and economically feasible; however, the NDOW identified potential adverse impacts from this alternative to the Henderson Pass Lek, which is an active lek approximately 0.12 mile from the Mount Hope well field road. In order to evaluate whether this alternative is environmentally reasonable, this alternative was carried through for detailed analysis in the EIS.

2.4 Alternatives Considered but Eliminated from Detailed Analysis

The following alternatives were considered but were eliminated from further analysis in the EIS because they failed to meet one or more of the alternative screening criteria.

2.4.1 Diamond Valley Substation Alternative

Mt. Wheeler has multiple existing 25 kV overhead distribution lines that converge immediately east of Highway 278 in Section 18, T21 North, R53 East, Mount Diablo Base and Meridian. Mt. Wheeler considered the installation of a Diamond Valley Substation on a parcel of land administered by the BLM within Section 18 (**Figure 2.2-20**). The proposed substation would be fed by a new 69 kV overhead transmission line extending north from the Machacek Substation. This substation location would have provided additional service connection availability to each of these existing overhead distribution lines. This would have increased overall system reliability in addition to providing a location of interconnection for the load service to the Project's proposed 25 kV overhead distribution line.

Using the screening criteria mentioned above, this alternative is consistent with the Purpose and Need for the Project and is technically practical and feasible. However, it was determined the alternative resulted in additional environmental impacts to sensitive resources compared to the Proposed Action. There were concerns to sensitive resources from additional linear overhead transmission facilities outside of the existing utility corridor along the Falcon to Gonder 345 kV transmission line. Elimination of this alternative addresses significant concerns regarding overhead transmission lines through greater sage-grouse habitat in close proximity to active greater sage-grouse leks. Therefore, the Diamond Valley Substation Alternative was not considered for detailed analysis in the EIS.

2.4.2 Diamond Valley West Substation Alternative

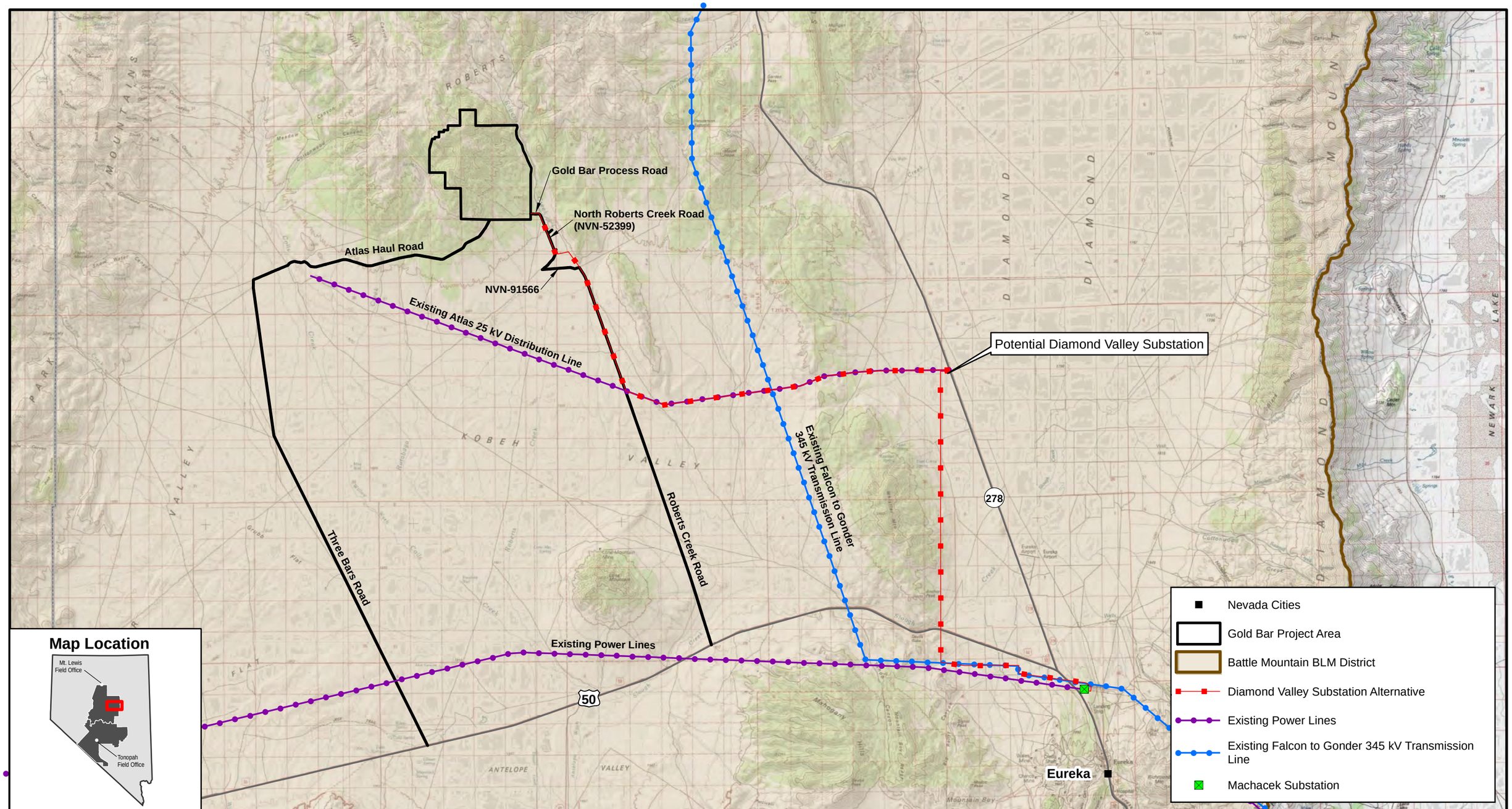
An alternative location of the Diamond Valley Substation was considered at the intersection of the existing Atlas 25 kV overhead distribution line and the existing Falcon to Gonder 345 kV transmission line in Section 18, T21 North, R52 East, Mount Diablo Base and Meridian (**Figure 2.2-21**). This would allow a proposed 69 kV overhead transmission line to parallel the existing Falcon to Gonder 345 kV facility for the entire length before reaching the new substation site. This substation location would require that each of the other existing 25 kV overhead distribution lines converging in Section 18, T21 North, R53 East be extended west to reach this alternate substation location. This would have resulted in an extension of approximately six miles per line, or (three lines multiplied by six miles) approximately 18 miles of additional overhead distribution line construction.

Using the screening criteria mentioned above, this alternative is consistent with the Purpose and Need for the Project and is technically practical and feasible. However, it would require extensive ancillary facility improvements including construction of additional overhead distribution lines. This extensive facility expansion and associated surface disturbance resulted in this alternative not being economically practical or feasible, and not environmentally reasonable compared to the Proposed Action. Elimination of this alternative addresses significant concerns regarding overhead transmission lines through greater sage-grouse habitat in close proximity to active greater sage-grouse leks. Therefore, the Diamond Valley West Substation Alternative was not considered for detailed analysis in this EIS.

2.4.3 Roberts Creek Road as Only Access

An alternative access to the Plan was considered to use North Roberts Creek Road as the sole means of Project access with no secondary access (**Figure 2.2-22**). This alternative was considered to reduce environmental impacts from the use of two access roads (i.e., a primary access route and a secondary access route). This alternative would access the Project via U.S. Highway 50 to Roberts Creek Road, then North Roberts Creek Road, then Gold Bar Process Road, then into the Plan boundary. With this alternative there would still be a maintenance road for the distribution line and water pipeline that is proposed to follow the access road. This alternative would require a 70-foot corridor from U.S. Highway 50 to the Plan boundary. The existing running surface of Roberts Creek Road is approximately 30 feet wide. In order to accommodate large trucks, Roberts Creek Road would need to be widened to 70 feet from U.S. Highway 50 to North Roberts Creek Road. North Roberts Creek Road would also need to be widened to 70 feet to accommodate haul trucks. This alternative was developed to address concerns regarding impacts from the use of two access roads.

This alternative would meet the Purpose and Need of the Project, it would be technically and economically feasible, but it was determined the alternative would not be environmentally reasonable because it would result in additional environmental impacts to sensitive resources compared to the Proposed Action. This alternative would create approximately 78 additional acres of disturbance as a result of upgrading Roberts Creek Road and North Roberts Creek Road to a haul road within greater sage-grouse habitat where an alternate access road (Atlas Haul Road) already exists. Elimination of this alternative addresses significant concerns regarding impacts to greater sage-grouse habitat in close proximity to active greater sage-grouse leks. Therefore, the Roberts Creek Road Alternative was not considered for detailed analysis in the EIS.



Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 3 6 Miles
1 in = 3 miles

N

DIAMOND VALLEY SUBSTATION ALTERNATIVE

FIGURE 2.2-20

REVISION .
A

2/3/2017

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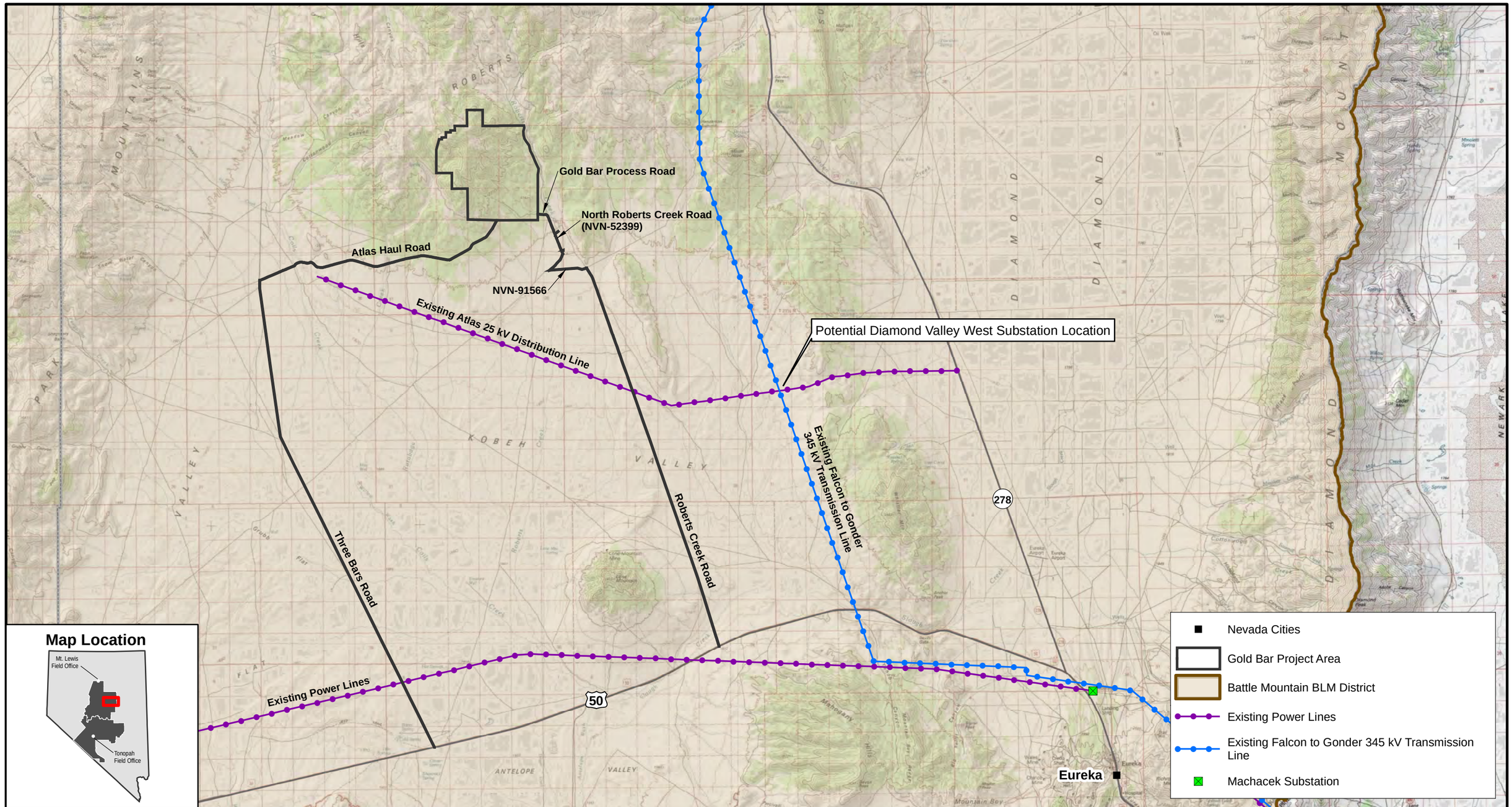

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 3 6 Miles
1 in = 3 miles

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DIAMOND VALLEY WEST SUBSTATION ALTERNATIVE

FIGURE 2.2-21

REVISION **A**

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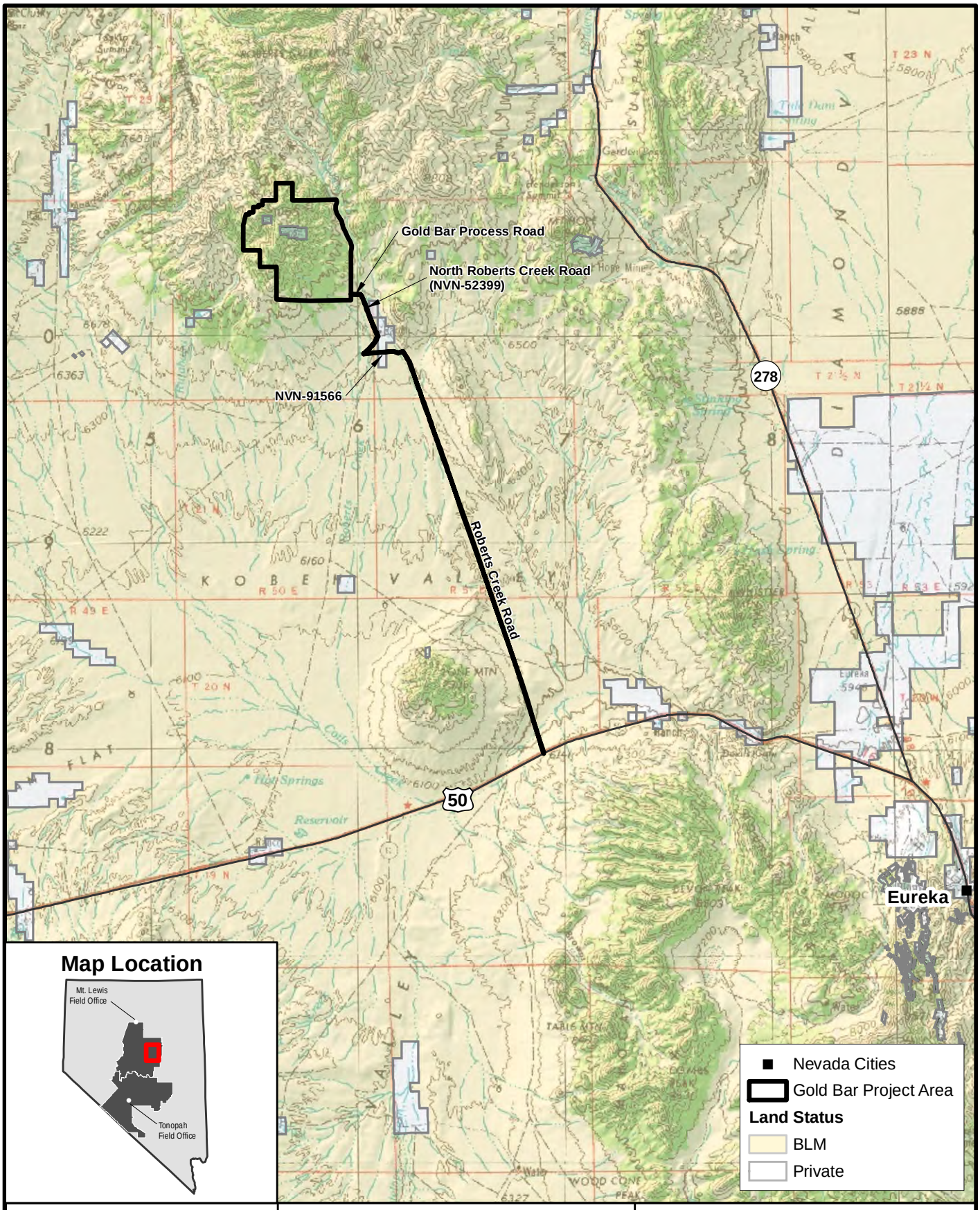

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 2 4 Miles
1 in = 4 miles

N

ROBERTS CREEK AS ONLY ACCESS ALTERNATIVE

FIGURE 2.2-22

1/31/2017

REVISION
A

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

2.4.4 Pick South Upper and Lower WRDAs Alternative

An alternative to the Plan was considered to construct two additional WRDAs. The Pick South Upper WRDA and the Pick South Lower WRDA would be constructed south of the Pick Pit. The volume of the Pick South Upper WRDA would be 17,100,000 cubic yards and would result in 62 acres of disturbance on BLM administered land. The volume of the Pick South Lower WRDA would be 12,200,000 cubic yards and would result in approximately 67 acres of surface disturbance on BLM administered land.

Using the screening criteria mentioned above, this alternative is consistent with the Purpose and Need for the Project and is technically practical and feasible. This alternative would allow for additional area to store waste rock material. However, this alternative would increase Project disturbance by 129 acres, thus increasing the environmental impacts. After a thorough review and re-engineering design of the facility, it was determined that these two waste rock dumps were not necessary for production. As a result, this alternative was determined to not be economically practical or environmentally reasonable. Elimination of the alternative would address the concerns regarding using the most current design and processes to reduce impacts from the Project. In addition, elimination of this alternative would reduce disturbance and address concerns brought up during the public scoping period regarding Project related disturbance and how it would impact various resources.

2.4.5 Additional Process Pond Alternative

An alternative to the Plan was considered to construct an additional process pond for a total of three process ponds to be used during facility production. This process pond would have added an additional 3.2 acres of surface disturbance to the Project disturbance footprint. Using the screening criteria mentioned above, this alternative is consistent with the Purpose and Need for the Project and is technically practical and feasible. This alternative would allow for an additional pond for process water storage. However, it would increase the surface disturbance by approximately 3.2 acres, thus increasing the environmental impacts at the facility, and is not economically optimal. After a thorough review and engineering design of the facility, it was determined that the additional process pond was not necessary for production at the facility. As a result, this alternative was determined to not be environmentally reasonable or economically practical. Elimination of the alternative would address the concerns brought up at the alternative screening meeting regarding using the most current design and processes to reduce impacts from the Project. In addition, elimination of this alternative would reduce disturbance and address concerns regarding Project-related disturbance and how it would impact various resources.

2.5 Comparison of Effects for the Alternatives

Table 2.5-1 compares the anticipated effects from each alternative on the resources analyzed in this EIS. Chapter 4 provides more detail, including analysis methods and rationale for the effects conclusions.

Table 2.5-1 Comparison of Effects

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
Air Quality					
Impacts to air quality from mining, dust, and vehicle emissions	Mining activities would increase emissions for the life of the project. Modeling has determined that impacts would be below the applicable National Ambient Air Quality Standards (NAAQS) for all the pollutants and averaging periods. Air emissions including point and fugitive sources, would be controlled in accordance with the air quality permit.	No emissions from generators would occur under this alternative. However, fugitive and tailpipe emissions from the access road for distribution line construction and maintenance could occur. These impacts are expected to be minimal. Overall, emissions are expected to be lower than for the Proposed Action.	Impacts would be similar to the Proposed Action, except fugitive dust and tailpipe emissions would be concentrated on Three Bars Road/Atlas Haul Road.	Impacts would be similar to the Proposed Action, except fugitive dust and tailpipe emissions would occur at the Mount Hope well field road rather than Roberts Creek Road.	Minimal impacts from fugitive dust and emissions would occur from 16 acres of Notice-level activities.
Cultural Resources					
Disturbance to cultural sites	49 eligible cultural sites would be impacted by the Project. The Memorandum of Agreement (MOA), Historic Properties Treatment Plan (HPTP), EPMs, and mitigation would minimize these impacts.	Three additional eligible cultural sites would be impacted by the Project (52 sites total). The MOA, HPTP, EPMs, and mitigation would minimize these impacts.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts would occur to the 19 eligible cultural sites within the area of the Notice-level activities as a result of avoidance.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
Environmental Justice					
Disproportionate effects on minority or low income populations	The Proposed Action would not result in a disproportionate effect on a minority population or low income population.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.
Forest Products					
Loss of woodland communities	The Proposed Action would result in removal of 649 acres of woodland communities. None of the communities are considered unique.	Impacts would be similar to the Proposed Action, except there would be an additional 16 acres of woodland communities removed under this alternative for a total of 665 acres.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres of woodland communities could be removed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Geology and Minerals					
Ore extraction and waste rock placement	The Proposed Action would mine 72.5 million tons of waste rock and 13 million tons of ore reserves.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	Minimal rock would be collected from drill holes under Notice-level activities.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
Grazing Management					
Reduction of Animal Unit Months (AUMs)	The Proposed Action would result in the permanent loss of 10 AUMs and the long-term loss of 69 AUMs. Effects would be reduced by reclamation and EPMs.	Impacts would be similar to the Proposed Action except there would be additional long-term reduction of 7.5 active AUMs due a loss of forage availability along the distribution line for a total long-term loss of 76.5 AUMs.	Same as the Proposed Action.	Same as the Proposed Action, except vehicle-livestock collisions may be reduced because the Mount Hope boundary would be fenced and exclude livestock.	No reduction of AUMs would occur; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Impacts to range improvements	MMI would maintain/replace any cattle guards impacted by the Project as needed. Gates would be added where roads would cross existing fencelines. Also, fences constructed during the Project would be removed during reclamation.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts to range improvements would occur from Notice-level activities.
Hazardous Materials					
Accidental spills/releases during transportation	Chemical spills during transportation could occur but the probability of a spill is expected to be very low. The commercial transportation company would be responsible for first response and cleanup.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	Spill or release of hazardous materials associated with Notice-level activities could occur; however, fewer types of chemicals would be used under this alternative.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
	Local and regional law enforcement and fire protection agencies also may be involved to secure the site and protect public safety.				
Accidental spills/releases during storage or use	Some spills of chemicals and fuel could occur during operations. In the event of such a spill, the spill would be handled in accordance with the Spill Contingency Plan/Emergency Response Plan.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	No hazardous materials would be stored at the site under this alternative.
Historic Trails					
Impacts to Pony Express National Historic Trail (NHT)	There would be effects to the visual setting of the National Trail study corridor from mining and processing facilities. Other effects would be increased traffic from the Project where the Pony Express NHT crosses the mine access roads; the improvements to North Roberts Creek road which would change the appearance of the road within the NHT trail corridor; and	Impacts would be similar to the Proposed Action, but there would be additional visual impacts to the setting of the trail from the overhead distribution line.	Same as the Proposed Action, except the visual, noise, and traffic impacts described under the Proposed Action associated with the use of Roberts Creek Road would not occur. .	Impacts would be similar to the Proposed Action, and there would additional traffic and noise impacts to the Pony Express Trail along the Mount Hope well field road.	Effects include visual impacts from the approved 16 acres of Notice-level activities. Additionally, under this alternative approximately 420 acres of existing disturbance would not be reclaimed which may reduce existing visual impacts to the Pony Express Trail.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
	Project-related noise associated with use of Roberts Creek Road.				
Land Use, Access, Realty, and Transportation					
Loss of public land for multiple uses	Project disturbance on BLM-administered public land would result in the short-term, loss of approximately 946 acres of public land for multiple use authorizations for the life of the mine. Reclamation of approximately 975 acres of Project related disturbance as well as an additional approximately 25 acres of non-MMI disturbance would provide a post-mining surface condition consistent with the expected long-term land uses.	Impacts would be similar to the Proposed Action, and include an additional direct loss of 124 acres of public land for multiple use authorizations from the distribution line.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres could be disturbed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Loss of access within fenced boundary	Approximately 127 acres of mining and processing facilities would be fenced at the administration and process area, and at the generator and water storage area by GBPW-210.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts from fencing would occur under this alternative.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
Transportation and traffic effects	Under the Proposed Action, maximum trip generation on Three Bars Road would be 10 trips per day and 40 van trips per day on Roberts Creek Road for the life of mining operations.	Same as the Proposed Action, with the addition of 14 trips per day along U.S. 50 for the six months of distribution line construction.	Impacts would be similar to the Proposed Action, except the light vehicle traffic (40 trips per day) associated with mining would not use Roberts Creek Road and all vehicle traffic would use Three Bars Road.	Impacts would be similar to the Proposed Action, except the light vehicle traffic (40 trips per day) associated within mining would use the Mount Hope access road and well field road instead of Roberts Creek Road.	Impacts to transportation would not change from existing conditions under this alternative.
Impacts to ROWs and land use authorizations	The Proposed Action would not result in impacts or changes to land ownership. Mining and processing facilities would not result in conflicts, substantial modifications or termination of the ROWs or land use authorizations. No ROW relocations would be required as a result of the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action	No impacts to ROWs or land use authorizations expected from Notice-level activities.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
Native American Concerns					
Disturbance to traditional cultural properties (TCPs), properties of traditional religious and cultural importance, or sacred sites	None identified. Consultation is ongoing.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	None identified.
Noise					
Impacts to noise levels	Impacts to noise levels from mining, blasting, and travel would not exceed EPA exterior noise criteria. The blasting plan identifies how impacts would be monitored to ensure proper sound and vibration levels are maintained.	Impacts would be similar to the Proposed Action, except there would be some short-term noise during construction of the distribution line. Noise from construction is not expected to be detected at Three Bars or Roberts Creek Ranches.	Impacts would be similar to the Proposed Action for mine construction, operation, and blasting. There would be no noise generated from Project-related travel along Roberts Creek Road under this alternative, but these impacts were minimal.	Impacts would be similar to the Proposed Action for mine construction, operation, and blasting. Noise from light vehicle traffic would occur along Mount Hope well field road rather than Roberts Creek Road which is not expected to detected at the ranches.	Noise impacts from Notice-level activities would occur, and no noise impacts from mining or blasting would occur.
Paleontological Resources					
Loss of paleontological resources	One geologic unit in the Project area is known to host invertebrate fossils. No vertebrate fossils are known to occur in the formation and no Project disturbance is expected in this formation.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	None identified.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
Recreation					
Change in access to existing recreation opportunities or areas	In areas of active mining (including around the open pits and WRDAs), recreational activities would be restricted, and in the 127-acre fenced area. The Project does not offer unique recreational opportunities, and recreationists are likely to use nearby areas. Under the Proposed Action approximately 420 acres of existing disturbance would be reclaimed.	Impacts would be similar to the Proposed Action, except potential impacts to dispersed recreation may occur to an additional 124 acres of public land during construction of the ROW.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres could be disturbed under this alternative; however, not all disturbance would occur at once and not expected to impact recreational opportunities.
Socioeconomics Values					
Income and employment	The work force is expected to include 100 workers during construction, and between 120 and 135 workers during operation. This would be a 1.9 percent increase over 2015 employment levels. The work force during construction is anticipated to come from outside of the local area, whereas	Impacts would be similar to the Proposed Action, except there would be an additional six to 10 contract workers for up to six months during construction of the distribution line, and there would be a reduction in capital cost expenditures.	Same as the Proposed Action.	Same as the Proposed Action.	There would be no detectable impacts to income and employment from Notice-level activities since the work force is temporary and small.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
	the work force during operations is expected to come from the local area. The increased opportunity of employment would be considered beneficial to the local community.				
Population and housing	During construction, it is expected that the work force would occupy 66 percent of the total motel rooms in the Eureka area, and could result in competition for temporary housing. This impact is anticipated to last during the construction of the facility, which is anticipated to last approximately one year. During operations, vacant housing in the Eureka area is expected to be sufficient to meet the demand for an estimated 57 housing units.	Impacts would be similar to the Proposed Action, except there would be an additional six to 10 contract workers for up to six months during construction of the distribution line.	Same as the Proposed Action.	Same as the Proposed Action.	There would be no detectable impacts since the work force is small and temporary.
Infrastructure and community services	The Proposed Action is not expected to have an appreciable effect on	Impacts would be similar to the Proposed Action, except there would	Same as the Proposed Action.	Same as the Proposed Action.	There would be no detectable impacts since the work force

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
	infrastructure, but it may slightly increase calls to law enforcement and emergency services.	be an additional six to 10 contract workers for up to six months during construction of the distribution line.			is small and temporary.
Soils					
Disturbance and degradation of soil function	New disturbance to undisturbed soils would include approximately 718 acres of long-term disturbance with implementation of the Project. The majority of disturbance would be reclaimed, except for approximately 154 acres that would not be reclaimed.	Impacts would be similar to the Proposed Action, except an additional 130 acres (including public and private lands), for a total of 848 acres of soils that would be disturbed for the construction and maintenance of the distribution line.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres could be disturbed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Increased erosion	Effects to disturbed soils from the 718 acres of new surface disturbance would be minimized through implementation of EPMs, mitigation, and reclamation.	Impacts would be similar to the Proposed Action, except an additional 130 acres, for a total of 848 acres of soils would be disturbed for the construction and maintenance of the distribution line.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres could be disturbed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Contamination of soils from chemical spills	Spill or release of hazardous materials may occur, but impacts to soils from a potential spill of hydrocarbons or reagents would be	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	Spill or release of hazardous materials associated with Notice-level activities could occur; however, fewer types of

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
	minimized through implementation of EPMs and reclamation.				reagents would be used under this alternative.
Vegetation (including Invasive, Non-native Species and Noxious Weeds)					
Removal of vegetation	Approximately 718acres of previously undisturbed vegetation would be removed by the Proposed Action. Reclamation would minimize these effects, except on permanent disturbance located on an additional 154 acres.	Impacts would be similar to the Proposed Action, except an additional 130 acres (including private and public lands) for a total of 848 acres of vegetation would be disturbed for the construction and maintenance of the distribution line.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres of vegetation could be disturbed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Establishment and spread of invasive, non-native species and noxious weeds	Areas where vegetation is removed would be susceptible to weed invasion. EPMs, the Noxious Weed Plan, and reclamation would minimize these effects.	Impacts would be similar to the Proposed Action, except an additional 130 acres (including public and private land) of vegetation would be disturbed for the construction and maintenance of the distribution line where weeds may be introduced.	Impacts would be similar to the Proposed Action, except the potential for the spread of weeds would not occur along Roberts Creek Road as a result of the Project, and there may be an increased potential for the spread of weeds on Three Bars Road.	Impacts would be similar to the Proposed Action, except that the potential for the spread of weeds would occur along Mount Hope roads rather than along Roberts Creek Road.	Up to 16 acres of vegetation could be disturbed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Impacts to special status plant species	Impacts would occur to approximately 669 acres of vegetation communities that	Impacts would be similar to the Proposed Action, except an additional	Same as the Proposed Action.	Same as the Proposed Action.	No impacts to special status plant species were

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
	provide potential habitat for least phacelia, Beatley buckwheat, and Monte Neva paintbrush.	disturbance of 130 acres of potential habitat for least phacelia, Beatley buckwheat, and Monte Neva paintbrush could occur.			identified from this alternative.
Visual Resources					
Contrasting visual elements	Project features would be visible from Key Observation Points (KOPs) 1 and 3. The Proposed Action does not conflict with Visual Resource Management (VRM) Class IV objectives. There is a portion of the Project within VRM Class II, which would conflict with VRM Class II objectives. Reclamation would minimize these effects.	Impacts would be similar to the Proposed Action, and the distribution line would be visible from KOPs 1 and 2.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres could be disturbed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Water (Quality and Quantity)					
Impacts to existing wells (water quantity)	Modeling for an average of 380 gpm of alluvial groundwater for 10 years, indicates that the 10-foot drawdown would extend up to 1.4 miles from the Project pumping wells.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts to existing wells are expected from Notice-level activities.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
	Drawdown near the Roberts Creek Ranch well would be around 15 to 20 feet. No springs or seeps would be impacted from the pumping wells.				
Increase in sedimentation and erosion	New Surface disturbance of 718 acres may increase erosion and sedimentation during construction and operation. Implementation of EPMs and BMPs would reduce or minimize this impact.	Impacts would be similar to the Proposed Action, except an additional 130 acres of soils would be disturbed for the construction and maintenance of the distribution line.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres could be disturbed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Potential contamination of surface water	Accidental release of hydrocarbons from mobile sources during construction may occur. Implementation of BMPs in compliance with the SCP would reduce the impacts.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	Spill or release of hazardous materials associated with Notice-level activities could occur; however, fewer types of chemicals would be used under this alternative.
Changes in groundwater quality during operations	The acidic conditions created by the Potentially Acid Generating (PAG) rock may result in the release of sulfate and metals into the	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts to groundwater quality are expected from Notice-level activities.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
	groundwater. To prevent impacts, the WRDAs and HLPs would be designed and operated as a zero-discharge facilities to prevent release to the environment.				
Wetlands					
Removal of wetlands and riparian resources	No direct or indirect impacts to wetlands or riparian areas would occur under this alternative.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	No impacts to wetlands are expected from Notice-level activities.
Wildlife (including Migratory Birds)					
Loss of habitat	718 acres of new surface disturbance would occur under this alternative and remove existing wildlife habitat. Reclamation would minimize these effects, except on permanent disturbance located on 154 acres.	Impacts would be similar to the Proposed Action, except an additional 130 acres of habitat would be disturbed for the construction and maintenance of the distribution line.	Same as the Proposed Action.	Same as the Proposed Action.	Up to 16 acres could be disturbed; however, under this alternative approximately 420 acres of existing disturbance would not be reclaimed.
Displacement of wildlife	Human activity and presence would create noise that would result in wildlife avoiding the area and being displaced by the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	Same as the Proposed Action.	Notice-level activities would result in short-term displacement of wildlife.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
Impacts to greater sage-grouse	According to December 2015 mapping, surface disturbance would occur in 297 acres of Priority Habitat Management Areas (PHMA) and 767 acres of General Habitat Management Areas (GHMA). Indirect effects of noise to greater sage-grouse is not expected to exceed 10 dBA.	Effects would be similar to the Proposed Action, except according to SEP December 2015 mapping, construction of the distribution line would disturb approximately 79 acres of PHMA, 33 acres of GHMA, and 13 acres of Other Habitat Management Areas (OHMA).	Same as the Proposed Action, except to Roberts Creek Road would not be used, which would reduce noise and traffic impacts from the Project on that road.	Impacts would be similar to the Proposed Action, except travel and associated noise along the Mount Hope well field road would result in adverse impacts to the Henderson Pass lek.	Minimal impacts to greater sage-grouse are expected from Notice-level activities.
Wild Horses					
Loss of wild horse habitat and reduction in forage availability	718 acres of existing vegetation communities within the Plan boundary would be removed (which includes 11 acres of disturbance in the Roberts Mountain Herd Management Area [HMA]). Disturbance would reduce wild horse habitat and forage area. However, the habitat within the Plan boundary is not highly valuable for wild horses.	This alternative would result in an additional 62 acres of disturbance within the Roberts Mountain Complex; would result in 16 acres of disturbance within the Fish Creek South HMA. This would result in decreased potential forage availability until revegetation occurs.	Same as the Proposed Action.	Same as the Proposed Action.	Authorized Notice-level activities would continue to impact wild horse habitat and forage availability within approved Notice-level areas.

Potential Impact	Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access, Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative
Wild horse mortality or injury from vehicle collision	Increased traffic on Project access roads may increase risks of injury or mortality to wild horses from vehicle collisions. Mortalities and injuries would be reduced by the speed limit restrictions within the Plan boundary, new employee awareness training, signage at wild horse trails and the use of reflectors.	Increased wild horse mortality or injury may occur during construction due to use of access roads to the distribution line.	The potential for vehicle collisions with wild horses may be increased along the Atlas Haul Road between the Three Bars road and the Project boundary. A reduction in vehicle collisions may occur on Roberts Creek Road.	Potential impacts from vehicle-wild horse collisions may be reduced because the Mount Hope Project boundary would be fenced, excluding wild horses. However, this access road is not as straight as Roberts Creek or Three Bars Road, increasing opportunity for collisions due to reduced visual distance on corners.	Authorized Notice-level activities would continue to result in potential vehicle collisions with wild horses along access roads to the Notice-level activities.
Wild horse displacement	Increased vehicle traffic, noise levels, mining activities, and presence of humans may result in displacement of wild horses to surrounding areas, or changes in use patterns.	Additional displacement or wild horse avoidance of the area may occur during construction of the distribution line. Slight reductions in noise would occur during mining operations because fewer generators would be used at the processing facility.	Same as the Proposed Action.	Same as the Proposed Action.	Authorized Notice-level activities, including noise and presence of humans, would continue to result in potential displacement or wild horses in the area of active exploration activities.

2.6 Agency-Preferred Alternative

To be completed once BLM preferred alternative has been determined.

BLM

Gold Bar Mine Project

DRAFT ENVIRONMENTAL IMPACT STATEMENT
VOLUME II

Case File NVN-091037 | March 2017

U.S. Department of the Interior Bureau of Land Management
Mount Lewis Field Office
Battle Mountain District
50 Bastian Road
Battle Mountain, NV 89820

Cooperating Agencies:
The Eureka County Board of Commissioners
The National Park Service
The Nevada Department of Wildlife
The United States Fish and Wildlife Service
The United States Environmental Protection Agency, Region 9

BLM Mission Statement

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

DOI-BLM-NV-B010-2015-0010-DEIS

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LIST OF ACRONYMS & ABBREVIATIONS

°F	Degrees Fahrenheit
µg/m^3	Micrograms Per Cubic Meter
AADT	Annual Average Daily Traffic
AAQS	Ambient Air Quality Standards
ABA	Acid Base Accounting
ACHP	Advisory Council on Historic Preservation
ADR	Adsorption, Desorption, and Recovery
AERMOD	American Meteorological Society/USEPA Regulatory Model
AFY	Acre-Feet Per Year
AIRFA	American Indian Religious Freedom Act
AML	Appropriate Management Levels
amsl	Above Mean Sea Level

ANFO	Ammonium Nitrate and Fuel Oil
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
ARDML	Acid Rock Drainage and Metal Leaching
ARM	Appropriate Management Levels
ARMPA	Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment
ARPA	Archaeological Resource Protection Act of 1979
ASTM	American Society for Testing and Materials
ATV	All-Terrain Vehicle
AUM	Animal Unit Months
BAPC	Bureau of Air Pollution Control
bgs	Below Ground Surface
BLM	Bureau of Land Management
BMP	Best Management Practices
BMRR	Bureau of Mining Regulation and Reclamation
BP	Before Present
BWM	Bureau of Waste Management
CAA	Clean Air Act
CaO	Calcium oxide
CCD	Census County Division
CCS	Conservation Credit System
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CH_4	Methane
Chambers	Chambers Group
cm/sec	Centimeter Per Second
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CWA	Clean Water Act
dB	Decibel (unit of measurement)
dBA	A-weighted Decibels
DEIS	Draft Environmental Impact Statement
E	Evaporation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPM	Environmental Protection Measures

ESA	Endangered Species Act of 1973
ET	Evapo-transpiration
FCC	Federal Communications Commission
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land and Policy Management Act of 1976
FMUD	Final Multiple Use Decisions
FOS	Factor of Safety
FPPC	Final Plan for Permanent Closure
ft^3	Cubic Feet
FY	Fiscal Year
GAI	Geochemical Abundance Index
gals/day	Gallons Per Day
gals/yr	Gallons Per Year
GBC	Great Basin College
GBE	Great Basin Ecology, Inc.
GHG	Greenhouse gas
GHMA	General Habitat Management Areas
GIS	Geographic Information Systems
gpm	Gallons Per Minute
H:V	Horizontal:Vertical
H_2SO_4	Sulfuric Acid
HA	Herd Area
HCl	Hydrochloric Acid
HCT	Humidity Cell Tests
HDPE	High Density Polyethylene
HF	Hydrofluoric Acid
Hg	Mercury
HLP	Heap Leach Pad
HMA	Herd Management Area
HNO_3	Nitric Acid
HPTP	Historic Properties Treatment Plan
HQT	Habitat Quantification Tool
HSA	Hydrologic Study Area
HUC	Hydrologic Unit Code
IM	Instruction Memorandum
Kautz	Kautz Environmental Consultants, Inc.
KOP	Key Observation Point
kV	Kilovolt
kW	Kilowatt
L_{50}	Average noise level
L_{90}	Residual ambient noise level
lb	Pound
lbs	Pounds
LCRS	Leak Collection and Recovery System
L_{dn}	Day/night average sound level
L_{eq}	Average, or equivalent, sound level

L_{max}	Hourly maximum noise level
LNG	Liquid Natural Gas
LR2000	Legacy Rehost 2000 System
LTFM	Long-Term Funding Mechanism
LUPA/FEIS	Nevada and Northeastern California Greater Sage-Grouse Proposed Land Use Plan Amendment and Final EIS
mg/L	Milligrams per Liter
MLFO	Mount Lewis Field Office
MLRA	Major Land Resource Area
mm/yr	Millimeters Per Year
MMI	McEwen Mining Inc.
MMPA	Mining and Mineral Policy Act of 1970
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
mph	Miles Per Hour
MSHA	Mine Safety and Health Administration
Mt	Million Tons
Mt. Wheeler	Mt. Wheeler Power, Inc.
Mt/y	Million Tons Per Year
mv	Millivolts
MWMP	Meteoric Water Mobility Procedure
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NaCN	Sodium Cyanide
NAG	Net Acid Generation
NAGPRA	Native American Graves Protection and Repatriation Act
$NaNO_3$	Sodium Nitrate
NaOH	Sodium Hydroxide
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NNHP	Nevada Natural Heritage Program
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOI	Notice of Intent
NO_x	Nitrogen Oxides
NP	Neutralization Potential
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places

NRS	Nevada Revised Statutes
NST	National Scenic Trails
NTSA	National Trails System Act of 1968
O_3	Ozone
OHMA	Other Habitat Management Areas
OHV	Off-Highway Vehicle
OHWM	Ordinary High Water Mark
OPLA-PRP	Omnibus Public Land Management Act of 2009 Paleontological Resources Preservation
ORP	Oxidation-Reduction Potential
PAG	Potentially Acid Generating
Pb	Lead
$PbNO_3$	Lead Nitrate
PCPI	Per Capita Personal Income
PCS	Petroleum-contaminated Soils
PEL	Pick East Lower
PFYC	Potential Fossil Yield Classification
PHMA	Priority Habitat Management Areas
Plan	Plan of Operations
PLS	Pregnant Leach Solution
PM_{10}	Particulate matter less than 10 microns
$PM_{2.5}$	Particulate matter less than 2.5 microns
ppb	Parts per Billion
ppm	Part per Million
Project	Gold Bar Mine Project
PSD	Prevention of Significant Deterioration
PWR	Public Water Reserves
R	Range
RCRA	Resource Conservation and Recovery Act
REA	Rapid EcoRegional Assessment
ReGAP	Regional Gap Analysis Project
RFFA	Reasonably Foreseeable Future Action
RMCD	Roberts Mountain Charcoal District
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-Way
RV	Recreational Vehicle
SARA	Superfund Amendments and Reauthorization Act
SCP	Spill Contingency Plan
SDS	Safety Data Sheets
SEC	Sagebrush Ecosystem Council
SEP	Sagebrush Ecosystem Program
SETT	Sagebrush Ecosystem Technical Team
SHPO	State Historic Preservation Office
SiO_2	Silica
SIR	Scientific Investigation Report

SO_2	Sulfur Dioxide
SR	State Route
SRK	SRK Consulting (U.S.) Inc.
Stantec	Stantec Consulting Services Inc.
STM	State-and-Transition Models
T	Township
TCP	Traditional Cultural Property
TDS	Total Dissolved Solids
TNW	Traditional Navigable Waters
tpy	Tons Per Year
U.S.	United States
U.S.C.	United States Code
UNR	University of Nevada, Reno
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UUD	Unnecessary or Undue Degradation
V	Volt
VFS	Volunteer Fire Service
VOC	Volatile Organic Compound
VRM	Visual Resource Management
WFRHBA	Wild Free-Roaming Horses and Burros Act of 1971
WOUS	Waters of the United States
WPCP	Water Pollution Control Permit
WRCC	Western Regional Climate Center
WRDA	Waste Rock Disposal Area
WSA	Wilderness Study Area

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CHAPTER 4
ENVIRONMENTAL CONSEQUENCES AND CUMULATIVE EFFECTS

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Appendix F Greater Sage-Grouse Mitigation Plan for the Gold Bar Mine Project

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES AND CUMULATIVE EFFECTS

4.1 Introduction to Direct and Indirect Effects Analysis

The Proposed Action and Action Alternatives outlined in Chapter 2 may cause, directly or indirectly, changes in the human environment. This EIS assesses and analyzes these potential changes and discloses the effects to the decision-makers and public. This process of disclosure is one of the fundamental aims of NEPA. There are many concepts and terms used when discussing impacts assessment that may not be familiar to the average reader. The following sections attempt to clarify some of these concepts.

4.1.1 Impacts/Effects

The terms “effect” and “impact” are synonymous in NEPA documents. Effects may refer to adverse or beneficial ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the Proposed Action or action alternatives (40 CFR 1508.8). Effects may be direct, indirect, or cumulative in nature. Cumulative effects are analyzed in the second half of this chapter.

4.1.2 Direct Effects

A direct effect, caused by the action, occurs at the same time and place as the action (40 CFR 1508.8(a)). Direct and indirect effects are discussed in combination under each affected resource.

4.1.3 Indirect Effects

Indirect effects are reasonably foreseeable effects, also caused by the action, that occur later in time or are removed in distance from the action (40 CFR 1508.8(b)). Direct and indirect effects are discussed in combination under each affected resource.

4.1.4 Significance

The word “significant” has a very particular meaning when used in a NEPA document (40 CFR 1508.27). Significance is defined by CEQ as a measure of the intensity and context of the effects of a federal action on, or the importance of that action to, the human environment. Significance is a function of the beneficial and adverse effects of an action on the environment.

4.1.5 Intensity

Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining intensity of effect. This EIS primarily uses the terms major, moderate, minor, or negligible in describing the intensity of effects.

4.1.6 Context

Context means that the effect(s) of an action must be analyzed within a framework, or within physical or conceptual limits. Resource disciplines; location, type, or size of area affected (e.g., local, regional, national); and affected interests are all elements of context that ultimately determine significance. Both long- and short-term effects are relevant.

4.1.7 Indicators

Impact indicators are used to determine change (and the intensity of change) in a resource. Working from an established existing condition (i.e., baseline conditions described in Chapter 3) this indicator would be used to predict or detect change in a resource related to causal effects of the Proposed Action.

4.2 Air Quality

4.2.1 Indicators

Indicators for environmental impacts to air resources include estimated emissions and modeled concentrations of pollutants in the Project area and local region.

Effects Context for Air Quality

Localized: Changes are perceived at the location of the activity, but dissipate within a specified extent.

Regional: Changes are perceived throughout the airshed.

Duration of Effects Definitions for Air Quality

Short-term: Changes in ambient air quality occur at a site associated with a specific activity, for the duration of that activity.

Long-term: Changes in ambient air quality would remain beyond the end of a specific activity.

Intensity of Effects Definitions for Air Quality

No Substantial Adverse Effects: Air emissions would temporarily increase as a result of the Proposed Action, and are unavoidable. However, effects fall within all applicable air quality standards and would not exceed NAAQS or Nevada NAAQS.

Substantial Adverse Effects: Air emissions would increase significantly as a result of the Proposed Action and would exceed applicable NAAQS and Nevada NAAQS. Mitigation would have to be carefully coordinated and planned with local, state and federal agencies if a permit to proceed were to be issued.

4.2.2 Direct and Indirect Impacts of the Proposed Action

The air quality analysis was based on a dispersion modeling study prepared by River Environmental, LLC in March 2016 (River Environmental, LLC, 2016), as updated by a

memorandum prepared by Air Sciences in August 2016 (Air Sciences, 2016a). The EPA-approved AERMOD was used to conduct the air quality analysis. The model was run using elevated terrain based on a digital elevation model provided by MMI, the PRIME building downwash algorithms, EPA regulatory defaults, and the rural algorithm option that is based upon land use. Zero background concentrations for CO, NO_X, and SO_2 were originally proposed as recommended by BAPC for facilities located in rural Nevada. It was later decided to include background concentrations for the gaseous pollutants modeled to make the modeling results more conservative. The Project would operate under an NDEP air permit. BMPs and other MMI management practices would be implemented to control fugitive dust and point source emissions. For estimating emissions, it is assumed that on-site employees and supervisors would be able to identify and minimize fugitive dust emissions associated with the Project. In addition, all control equipment would be installed, operated, and maintained in good working order.

As noted in Chapter 3, meteorological data from the Eureka station was originally proposed for this project. Due to missing cloud cover data, the BAPC recommended replacing that meteorological dataset with meteorological data from the Elko station. The air quality modeling study used five years of meteorological data (2007 through 2011) from the Elko Meteorological Station located at the airport. The airport is approximately 80 miles northeast of the Project site. The use of this meteorological data is justified based on the close proximity of the meteorological site to the Project area. The data was pre-processed using AERMET, which is part of the AERMOD modeling system. Additional information regarding the modeling study is available in the Air Quality Impact Analysis (River Environmental, LLC, 2016).

The Project has the potential to emit coarse and fine particulate matter (PM, PM_{10}, $PM_{2.5}$, respectively), CO, NO_2, and SO_2, and emission estimates for PM_{10}, $PM_{2.5}$, CO, and SO_2 were made as part of this assessment. Emission estimates were not made for NO_2, but rather for the broader pollutant category of NO_X. In general, of the nitrogen oxides emitted from stationary and mobile sources, the majority of the NO_X emissions are in the form of NO, rather than in the form of NO_2. Further, NO_X emissions are substantially easier and more accurate to estimate. Because initial air impact assessments using NO_X instead of NO_2 are consistent with the Tier 1 approach recommended in Section 5.2.4 (Models for Nitrogen Dioxide Annual Average]) of Title 40, CFR, Appendix W to Part 51 - Guideline on Air Quality Models ("Appendix W") (40 CFR 51 Appendix W 2005), and result in a conservative assessment which over-predicts the anticipated ambient concentrations of NO_2 resulting from the facility, NO_X emissions are usually estimated and may be modeled as the first step in modeling NO_2 concentrations. If further refinement of the NO_2 impact is necessary, the Tier 2 Ambient Ratio Method (ARM) recommended by EPA (USEPA, 2011b) may be used. The Tier 2 ARM for the 1-hour NO_2 standard consists of multiplying the Tier 1 result by the conservative national default NO_2/NO_X ratio of 0.80. The Tier 2 ARM for the annual NO_2 standard consists of multiplying the Tier 1 result by the conservative national default NO_2/NO_X ratio of 0.75.

Emission estimates were not prepared for two other criteria pollutants: O_3 and Pb. Ozone is not a primary air pollutant which is directly emitted by the Project, or by most other air pollution sources. Instead, it is principally created from the chemical reaction of NO_X and volatile organic compounds

(VOCs) in the air under direct exposure to sunlight. Modeling for ozone formation and transport is a highly complex and resource intensive exercise, and has been typically conducted to guide the choice of strategies to correct a monitored ozone problem in an area not attaining the NAAQS for ozone. Although the EPA is currently proposing the incorporation of a tiered demonstration approach to address the secondary chemical formation of ozone associated with precursor emissions from major single sources, there are, at present, no formally recommended tools for single-source ozone modeling. Accordingly, although the Project's emissions of NO_X and VOCs were estimated, quantitative modeling for ozone was not undertaken.

With the phasing out of leaded gasoline in the 1970s, Pb is now an air pollutant emitted in substantial quantities only from certain facilities, such as lead smelters, refiners, and recyclers. The Project is not such a facility. Because Pb is neither a fuel additive that would be combusted on site nor a direct emission from mining activities, potential emissions of Pb are expected to be insignificant. Therefore, the Project emissions of Pb would not cause or contribute to an exceedance of the Pb NAAQS.

In 2008, the United States Supreme Court found that GHGs or CO_2e are air pollutants covered by the CAA. In 2010, EPA adopted regulations governing the permitting of large sources of GHGs and designated six pollutants as greenhouse gases, allocating a CO_2 equivalent to each of the non-CO_2 GHGs. Of these six GHGs [CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride], the Project has the potential to emit substantial quantities of only CO_2. While the emissions of CO_2, CH_4, and N_2O were quantified in the assessment, no modeling was conducted to assess air quality impacts from these emissions as there are no ambient air quality standards for GHGs.

For modeling purposes, the points of public access were determined to be any point outside of the Proposed Action perimeter, or equivalent physical obstructions constructed and maintained by MMI which exclude public access to the facility. Fugitive dust and vehicle exhaust from mining activities and equipment are not included in quantitative permit limits under the NDEP regulations; however, they must be managed under an operating permit. The Proposed Action would include existing and new land disturbance due to construction and operation of the proposed mining facilities.

Modeling of the potential effects of Project emissions on ambient air quality requires a reasonable estimate of Project emissions. The emission estimate should include all expected Project emission sources, each operating at its anticipated rate for the time period selected. The estimate should also reflect that not all Project emission sources would be operating at the same time. As the Project would be operating for approximately seven years (i.e., five years of active mining and leaching plus two years of residual heap leaching) with an additional four months of pit pre-stripping, some of the Project operations would be completed before others have commenced.

Nearly all substantial sources of criteria air pollutant emissions from the Project (or any other mine) are reasonably proportional to the rate of production and processing of the mined material (that is, the mine's "throughput"). This is especially true of PM_{10} and $PM_{2.5}$ emissions, the criteria

air pollutants emitted from the greatest number of Project sources, and typically the air pollutants of concern for a mining operation. A secondary factor is the distance this mined material is moved by haul trucks, as the movement of haul trucks on unpaved haul roads is typically the single largest source of PM_{10} and $PM_{2.5}$ emissions for mine projects.

Based on estimates provided by MMI of yearly Project material production rates over the proposed seven-year mine life, annual mine production (the total quantity of material mined and moved annually) is greatest in year 2019. An estimated 16,800 tons per day would be hauled out of Gold Pick Pit to the crusher system and 13,807 tons per day of waste material would be hauled to the Pick East Upper Dump. Therefore, Project Year 2019 was selected as the Project period to be assessed in the emission inventory and modeled for ambient air quality impacts.

Air Pollutant Emission Sources and Emission Inventory

A comprehensive list of all identified individual potential sources of Project criteria, criteria precursor and GHG air pollutant emissions ("emission units"), organized into "emission groups" of similar activities (such as pit sources, vehicles, etc.), are presented in Appendix A of River Environmental, LLC, 2016. Included in this list of 136 emission sources are the air pollutants potentially emitted from each of these emission units.

Estimates of the emission rates for five criteria air pollutants (PM_{10}, $PM_{2.5}$, CO, SO_2, and NO_X) were made from each emission unit for the applicable criteria air pollutant regulatory time periods (1-hour, 3-hour, 8-hour, 24-hour, and annual) for the Proposed Action emission sources that would operate during Year 2019 (**Table 4.2-1**).

Table 4.2-1 Emissions by Air Pollutant and Applicable Time Period

Time Period	PM_{10}	$PM_{2.5}$	SO_2	CO	NO_X
1-Hour (g/s)	--	--	0.064	4.59	3.30
3-Hour (g/s)	--	--	0.064	--	--
8-Hour (g/s)	--	--	--	4.59	--
24-Hour (g/s)	8.97	1.41	N/A	--	--
Annual (g/s)	N/A	1.37	N/A	--	3.51

Source: River Environmental, LLC, 2016, as revised by Air Sciences memorandum (Air Sciences, 2017a)

Boundary Receptors

The modeling protocol directs the use of "boundary" receptors (using Universal Transverse Mercator [UTM] North American Datum [NAD] 83 coordinates) spaced at approximately 25-meter intervals along the Project's Plan boundary.

Cartesian Grid Receptors

Cartesian receptor grids were created for the modeling (using UTM NAD83 coordinates) as follows:

- The first set of discrete receptors was concentrated at the Plan boundary and spaced 25 meters apart.
- The second dense receptor grid was developed from the Plan boundary out to approximately 600 meters and spaced at 50-meter intervals.
- The last layer of the Cartesian grid receptors was developed from roughly 600 meters to 3,000 meters out from the Plan boundary and spaced at 150-meter intervals.

AERMOD Model Results

The maximum modeled pollutant concentrations and design values for the Proposed Action are presented in **Tables 4.2-2** and **4.2-3**. The total design value concentrations reflect the inclusion of background concentrations. As shown in the last column of **Tables 4.2-2** and **4.2-3**, the Proposed Action would be in compliance with the NAAQS as well as the Nevada Ambient Air Quality Standards (AAQS).

Table 4.2-2 Modeled Air Pollutant Concentrations - NAAQS

Pollutant	Averaging Period	Concentrations (µg/m^3)				Total Percent of NAAQS (%)
		NAAQS	Modeled Concentration	Background	Total	
PM_{10}	24-hour	150	82	10.2	92	61
$PM_{2.5}$	24-hour	35	24	7	31	89
	Annual	12	6.6	2.4	9	75
SO_2	1-hour	196	8	0.65	9	5
	3-hour	1,300	4	28.6	33	3
NO_2	1-hour	188	141	9.2	150	80
	Annual	100	5	9.4	14	14
CO	1-hour	40,000	524	3,771	4,295	11
	8-hour	10,000	349	1,666	2,015	20

Source: River Environmental, LLC (2016), as revised by Air Sciences memorandum (Air Sciences, 2016a and 2017a)

Table 4.2-3 Modeled Air Pollutant Concentrations – Nevada AAQS

Pollutant	Averaging Period	Concentrations (µg/m³)				Total Percent of Nevada AAQS (%)
		Nevada AAQS	Modeled Concentration	Background	Total	
PM_{10}	24-hour	150	82	10.2	92	61
	Annual	50	N/A	N/A	N/A	N/A
$PM_{2.5}$	24-hour	35	24	7	31	89
	Annual	12	6.6	2.4	9	75
SO_2	1-hour	196	8	0.65	9	5
	3-hour	1,300	4	28.6	33	3
	24-hour	365	N/A	N/A	N/A	N/A
	Annual	80	N/A	N/A	N/A	N/A
NO_2	1-hour	188	141	9.2	150	80
	Annual	100	5	9.4	14	14
CO	1-hour	40,500	524	3,771	4,295	11
	8-hour	7,000	349	1,666	2,015	29

Source: River Environmental, LLC, 2016, as revised by Air Sciences memorandum (Air Sciences, 2016a and 2017a)

In summary, increases in emissions of criteria air pollutants (i.e., PM_{10}, SO_2, NO_X, CO) associated with the Project would be short-term (lasting through the end of mining) and would be within Nevada and NAAQS. Following the completion of mining and subsequent reclamation, air quality would return to background levels determined by emissions from other regional source operations and/or natural background pollutant concentrations; therefore, impacts to air quality are considered to be short-term, localized, and with no substantial adverse effects.

Applicability of GHG Emissions and Climate Change to the Proposed Action

The EPA and CEQ have implemented regulations and guidelines regarding evaluation of GHG emissions and climate change, and the manner in which NEPA documents should address these issues. The U.S. Supreme Court on April 2, 2007, ruled that the USEPA had authority to regulate GHGs as pollutants and required the USEPA to determine whether GHGs cause or contribute to global warming. In 2008, Congress directed the USEPA to publish a mandatory GHG reporting rule based on USEPA's existing authority under the CAA. On October 30, 2009, the USEPA published a final rule for the mandatory reporting of GHGs (40 CFR Part 98) from large GHG emissions sources in the U.S. Implementation of 40 CFR Part 98 is referred to as the Greenhouse Gas Reporting Program (USEPA, 2010a and 2010b). CEQ guidance requires the consideration of a proposed project's potential GHG emissions and the potential effects of climate change on a project in NEPA reviews of proposed federal actions. On August 1, 2016, the CEQ released a final guidance memorandum to federal agencies regarding their treatment of GHG emissions and climate change impact issues within the NEPA process (CEQ, 2016). The guidance addresses two related issues: 1) the treatment of GHG emissions that directly or indirectly may result from a proposed federal action, such as the permitting of a proposed project; and 2) the analysis of

potential climate change impacts on a proposed federal action. On January 12, 2017, the CEQ released a permanent instruction memorandum to federal agencies regarding their treatment of GHG emissions and climate change impact issues within the NEPA process (CEQ, 2017). The memorandum instructs the BLM to 1) use projected greenhouse gas emissions as a proxy for assessing potential climate change effects when preparing a NEPA analysis; and 2) quantify and disclose to the fullest extent possible the reasonably foreseeable direct and indirect GHG emissions when analyzing the direct and indirect effects of the Proposed Action. The evaluation of GHG emissions and climate change impacts within this EIS is based on the CEQ guidance memorandums regarding the treatment of GHG emissions and climate change impacts within a NEPA document (CEQ, 2016 and 2017). Specifically, the guidance recommends consideration of:

- Direct and indirect GHG emissions effects of a Proposed Action and alternatives; and
- The relationship of climate change effects to a Proposed Action or alternatives in terms of the proposal design, environmental impacts, mitigation, and adaptation measures.

The CEQ guidance acknowledges that the nature of a Proposed Action and its relationship to climate change must be considered to determine the level of analysis appropriate to a specific NEPA document. In addition, the USEPA (USEPA, 2016) organizes GHG emission sources into “scopes” according to the type of impact, direct or indirect, of the emissions.

- Scope 1: Direct GHG emissions from sources that are owned or controlled by the project proponent, including emissions from fossil fuels burned on site, emissions from owned or leased vehicles, and other direct sources.
- Scope 2: Indirect GHG emissions from the generation of electricity, heat, or steam generated offsite but purchased by the proponent.
- Scope 3: Indirect GHG emissions from sources not owned or directly controlled by the proponent but related to the proponent’s activities, such as vendor supply chains, delivery services, outsourced activities, production of construction materials, and employee travel.

Recent scientific evidence suggests there is a direct correlation between global warming and emissions of GHGs. Although many of these gases occur naturally in the atmosphere, man-made sources substantially have increased the emissions of GHGs over the past several decades. Of the man-made GHGs, the greatest contribution currently comes from CO_2 emissions.

Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks (i.e., vegetation) cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused GHG concentrations to increase dramatically, and are a possible contributor to overall global climatic changes (IPCC, 2007b). Potential changes to the Project area resulting from the effects of climate change forecasted by the Central Basin and Range Rapid EcoRegional

Assessment (REA) could include higher than normal growing season temperatures, contraction or expansion of some existing vegetation communities, the expansion of existing noxious weed populations, and the introduction of noxious weeds previously undocumented in the ecoregion and Project area (Comer et al., 2013). Regarding temperature increases specifically, the Central Basin and Range REA forecasts an average increase in average summer maximum daytime temperatures of approximately five °F within the Project area by 2060 (Comer et al., 2013). These increases in average growing season temperatures are anticipated to result in low elevation basins throughout the Central Basin and Range ecoregion potentially transitioning from the existing cool semi-desert vegetation communities into very warm and sparsely-vegetated desert landscapes more typical of the Mojave Basin and Range. With respect to precipitation, there is no strong trend towards either wetter or drier conditions in any month for the Central Basin. With the exception of a slight increase in summer "monsoon" rains towards the south and east, there is no significant forecasted trends in precipitation for any other months in either the near term (2020) or midcentury (2050s) (Comer et al., 2013).

Climate change analyses are comprised of several factors, including GHGs, land use management practices, and the albedo effect. Although tools necessary to quantify incremental climatic impacts of specific activities associated with those factors are presently available. The impact assessment of effects of specific anthropogenic activities is difficult to quantify. Additionally, specific levels of significance have not yet been established. Therefore, climate change analysis for the purpose of this document is limited to accounting and disclosing of factors that contribute to climate change. Qualitative and/or quantitative evaluations of potential contributing factors within the study area are included where appropriate and practicable.

Energy Consumption and GHG Emissions for the Proposed Action

Annual emissions of GHGs from construction and operations sources are directly related to the consumption of fuels (combustion). The Project would provide its own power using generators so there would be no indirect contribution to GHG emissions at the power plants that furnish power to the grid due to the Project. GHG emissions for the Project are generated from direct combustion of fossil fuels including diesel, LNG, and gasoline by process sources, insignificant sources, and mobile mining equipment. **Table 4.2-4** summarizes the GHG emissions per year under the Proposed Action.

Table 4.2-4 GHG Emissions Summary

GHG	Annual Emissions (tpy)	Annual CO_2e Emissions[1] (metric tpy)[2]
CO_2	171,000	154,700
CH_4	7.24	164
N_2O	1.48	400
Total CO_2e	--	155,300

Source: River Environmental, LLC, 2016

[1] CO_2e emissions are calculated by summing the individual greenhouse gas emissions multiplied by their global warming potential (GWP). The GWP of CO_2 is 1, of CH_4 is 25, and of N_2O is 298.

[2] A metric ton is equivalent to 2204.6 pounds

tpy = tons per year

Total GHG emissions from the Proposed Action would be an estimated 155,000 metric tpy of CO_2e (River Environmental, LLC, 2016). These emissions would contribute cumulatively to global annual GHG emissions, which total an estimated 41 billion metric tons (Emissions Database for Global Atmospheric Research, 2012). Per the EPA GHG Equivalencies Calculator, the Proposed Action would produce approximately the same amount of GHG emissions annually as that produced by 16,399 households annually from energy consumption. GHG emissions from transportation on the mine access roads is anticipated to be 419.3 tpy (Air Sciences, 2017c). As stated previously, cumulative GHG emissions have been linked with accelerated global climate change (IPCC, 2007a). The GHG emissions from the Proposed Action would be the result of the use of required equipment. There is no effective mitigation to prevent these Project emissions.

4.2.2.1 Unavoidable Adverse Impacts

Air impacts as a result of the Proposed Action are unavoidable but are within all applicable air quality standards. The Project would include use of control devices and dust suppression methods to mitigate particulate emissions. MMI would commit to the implementation of these air emissions controls in the BAPC air permit and in the Fugitive Dust Control Plan for the Project. Due in part to these emission controls, the air quality analyses have demonstrated that impacts to air quality would not exceed acceptable levels compared to NAAQS and Nevada AAQS. The State of Nevada may require additional monitoring or mitigation measures as required by regulations, if such regulations are triggered. To ensure that the BLM is informed of air quality impacts and the steps taken to mitigate impacts and comply with Nevada's regulatory requirements, the BLM would require that MMI submit copies of all air quality reports delivered to the State of Nevada to the BLM MLFO, and report annually to the BLM on measures taken to control emissions of fugitive dust.

4.2.2.2 Irreversible and Irretrievable Commitments of Resources

Commitment of the local air resource to impacts from Project air emissions would be irretrievable for the duration of the operations. Air emissions would not exceed NAAQS or Nevada AAQS. Air Quality would return to ambient conditions after completion of the Proposed Action.

4.2.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Increases in emissions of criteria air pollutants (i.e., PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO) associated with the Proposed Action would be short-term (life-of-mine) and transitory in nature and would be within Nevada AAQS and NAAQS. Following the completion of mining and subsequent reclamation, air quality would return to background levels determined by emissions from other regional source operations and/or natural background pollutant concentrations.

4.2.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Under this alternative, a 25 kV power distribution line was considered as an alternative to the LNG generators to supply power to the Project. From an air pollutant emissions perspective, this alternative would remove emissions associated with the generators from the Proposed Action and add fugitive and tailpipe emissions from the access road for distribution line construction and

maintenance, which are expected to be minimal. The result would be a reduction in direct criteria air pollutant and GHG emissions and, to a lesser extent, an increase in indirect emissions. A quantitative air quality assessment was not performed for this alternative as overall emissions are expected to be lower than for the Proposed Action. Impacts are anticipated to be short-term, localized, with no substantial adverse effects.

4.2.3.1 Unavoidable Adverse Impacts

The unavoidable adverse impacts as a result of this alternative would be the same as the Proposed Action. This alternative would include use of control devices and dust suppression methods to mitigate particulate emissions similar to the Proposed Action. MMI's air emissions controls in the BAPC air permit and Fugitive Dust Control Plan would also apply to this alternative. Due in part to these emission controls, the air quality analyses have demonstrated that impacts to air quality would not exceed acceptable levels compared to NAAQS and Nevada AAQS. The State of Nevada may require monitoring or mitigation measures as required by applicable regulations. Under this alternative the BLM would require that MMI submit copies of all air quality reports delivered to the State of Nevada to the BLM MLFO, and report annually to the BLM on measures taken to control emissions of fugitive dust.

4.2.3.2 Irreversible and Irretrievable Commitments of Resources

Irreversible or Irretrievable commitments of air resources would not result from this alternative. Air emissions would not exceed NAAQS or Nevada AAQS. Air quality would return to existing conditions after completion of this alternative.

4.2.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Increases in emissions of criteria air pollutants (i.e., PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO) associated with this alternative would be short-term (life-of-mine) and transitory in nature and would be within Nevada AAQS and NAAQS. Following the completion of mining and subsequent reclamation, air quality would return to background levels determined by emissions from other regional source operations and/or natural background pollutant concentrations.

4.2.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action: short-term, localized, with no substantial adverse effects. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. From an air pollutant emissions perspective, this alternative would be similar to the Proposed Action except all the light vehicle traffic fugitive dust and tailpipe emissions would be concentrated on Three Bars Road/Atlas Haul Road instead of the Roberts Creek Road. An air quality assessment was not performed for this alternative as the change is expected to be negligible. This alternative is estimated to generate a

slightly higher amount of facility-wide emissions than the Proposed Action. **Table 4.2-5** summarizes the potential emissions increase per year from the alternative access road route, however the impact would still be considered short-term, localized, with no substantial adverse effects.

Table 4.2-5 Three Bars Road/Atlas Haul Road as Only Access Alternative Emissions Changes (tpy)

PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOCs	CO_2e
28.8	5.9	0.6	0.9	0.1	0. 003	0. 003	109.4

Source: Air Sciences, 2016b and 2017c

This alternative differs from the Proposed Action only with respect to the different access road configurations. However, GHG emissions for this alternative are anticipated to slightly increase from the Proposed Action.

4.2.4.1 Unavoidable Adverse Impacts

The unavoidable adverse impacts as a result of this alternative would be the same as the Proposed Action: short-term, localized, with no substantial adverse effects. This alternative would include use of control devices and dust suppression methods to mitigate particulate emissions similar to the Proposed Action. MMI's air emissions controls in the BAPC air permit and Fugitive Dust Control Plan would also apply to this alternative. Due in part to these emission controls, the air quality analyses have demonstrated that impacts to air quality would not exceed acceptable levels compared to NAAQS and Nevada AAQS. The State of Nevada may require monitoring or mitigation measures as required by applicable regulations. Under this alternative the BLM would require that MMI submit copies of all air quality reports delivered to the State of Nevada to the BLM MLFO, and report annually to the BLM on measures taken to control emissions of fugitive dust.

4.2.4.2 Irreversible and Irretrievable Commitments of Resources

The commitments of local air resources from this alternative for the duration of the Project would be irretrievable. Air emissions would not exceed NAAQS or Nevada AAQS. Air quality would return to existing conditions after activities cease under this alternative.

4.2.4.3 Relationship of Short-Term Uses and Long-Term Productivity

Increases in emissions of criteria air pollutants (i.e., PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO) associated with this alternative would be short-term (life-of-mine) and transitory in nature and would be within Nevada AAQS and NAAQS. Following the completion of mining and subsequent reclamation, air quality would return to background levels determined by emissions from other regional source operations and/or natural background pollutant concentrations.

4.2.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action: short-term, localized, with no substantial adverse effects. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for light vehicle traffic access. However, all heavy vehicle traffic would still use Three Bars Road, same as the Proposed Action. From an air pollutant emissions perspective, this alternative would be similar to the Proposed Action, except fugitive dust and tailpipe emissions would occur at the Mount Hope well field road rather than Roberts Creek Road. An air quality assessment was not performed for this alternative as the change is expected to be minimal. This alternative is estimated to generate slightly less facility-wide emissions as the Proposed Action. **Table 4.2-6** summarizes the potential emissions decrease per year from the alternative access road route.

Table 4.2-6 Mount Hope/North Roberts Creek Road for Light Vehicle Traffic Alternative Emissions Changes (tpy)

Access Road	PM	PM_{10}	$PM_{2.5}$	CO	NO_X	SO_2	VOCs	CO_2e
Mount Hope/ North Roberts Creek Road	-4.1	-0.9	-0.1	-0.2	-0.03	-0.001	-0.007	-39.1

Source: Air Sciences, 2016b and Air Sciences, 2017c

This alternative differs from the Proposed Action only with respect to the different access road configurations. However, GHG emissions for this alternative are anticipated to slightly decrease from the Proposed Action.

4.2.5.1 Unavoidable Adverse Impacts

The unavoidable adverse impacts as a result of this alternative would be the same as the Proposed Action: short-term, localized, with no substantial adverse effects. This alternative would include use of control devices and dust suppression methods to mitigate particulate emissions similar to the Proposed Action. MMI's air emissions controls in the BAPC air permit and Fugitive Dust Control Plan would also apply to this alternative. Due in part to these emission controls, the air quality analyses have demonstrated that impacts to air quality would not exceed acceptable levels compared to NAAQS and Nevada AAQS. The State of Nevada may require monitoring or mitigation measures as required by applicable regulations. Under this alternative the BLM would require that MMI submit copies of all air quality reports delivered to the State of Nevada to the BLM MLFO, and report annually to the BLM on measures taken to control emissions of fugitive dust.

4.2.5.2 Irreversible and Irretrievable Commitments of Resources

The commitments of local air resources from this alternative for the duration of the Project would be irretrievable. Air emissions would not exceed NAAQS or Nevada AAQS. Air Quality would return to existing conditions after activities cease under this alternative.

4.2.5.3 Relationship of Short-Term Uses and Long-Term Productivity

Increases in emissions of criteria air pollutants (i.e., PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO) associated with this alternative would be short-term (life-of-mine) and transitory in nature and would be within Nevada AAQS and NAAQS. Following the completion of mining and subsequent reclamation, air quality would return to background levels determined by emissions from other regional source operations and/or natural background pollutant concentrations.

4.2.6 Direct and Indirect Impacts of the No Action Alternative

Under the this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. The existing conditions would include the existing approximately 654 acres of disturbance from the previous Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action). There would be no direct emissions of criteria air pollutants (except for $PM/PM_{10}/PM_{2.5}$) or GHG pollutants. Potential fugitive dust impacts from the existing disturbance may continue to occur under this alternative. Impacts to air quality from this alternative are expected to be short-term, localized, with no substantial adverse effects.

4.3 Cultural Resources

4.3.1 Indicators

The indicator considered in the analysis of potential impacts to cultural resources is whether the Proposed Action and alternatives would result in adverse effects to properties listed on or determined eligible for listing on the NRHP (including unevaluated sites) or considered important to Native American tribes.

Section 106 of the NHPA requires that federal agencies consider the effect of a proposed undertaking on historic properties and provide the ACHP an opportunity to comment. The National Programmatic Agreement and the Nevada Protocol govern the roles and responsibilities of the BLM, ACHP, and Nevada SHPO for review and comment on the undertaking and effects on historic properties. Historic property, as defined by the regulations implementing Section 106, means “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the National Park Service.” The term includes properties of traditional religious and cultural importance to any Native American tribe or Native Hawaiian organization that meet the National Register criteria. Unevaluated sites are considered potentially eligible until they are evaluated or determined not eligible to the NRHP.

Potential impacts to historic properties are assessed using the “criteria of adverse effect” (36 CFR 800.5[a][1]), as defined in the implementing regulations for the NHPA. “An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling,

or association." The analysis of effects using these criteria is limited to those resources that are listed in the NRHP or have been recommended as eligible. There are five broad categories of effect:

1. Physical destruction or alteration of a property or relocation from its historic location;
2. Isolation or restriction of access;
3. Change in the character of the property's use, or of physical features within the property's setting, or the introduction of visible, audible, or atmospheric elements out of character with the significant historic features of the property;
4. Neglect leading to deterioration or vandalism; and
5. Transfer, sale, or lease from federal to non-federal control without adequate and legally enforceable restrictions or conditions to ensure preservation of the historic significance of the property.

Effects Context for Cultural Resources

Localized: Effects would be limited to eligible sites within the Project area.

Regional: Effects would occur to eligible sites outside of the direct effects APE..

Duration of Effects Definitions for Cultural Resources

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5[a][2]). There are three possible effects determinations:

Intensity of Effects Definitions for Cultural Resources

No Historic Properties Affected: A "no historic properties affected" determination indicates no historic properties are in the APE, or there are historic properties in the APE, but the undertaking would not alter the characteristics that qualify it for inclusion in or eligibility for the NRHP.

No Adverse Effect: A "no adverse effect" determination indicates there would be an effect on the historic property by the undertaking, but the effect does not meet the criteria of adverse effect in 36 CFR 800.5(a)(1) and would not alter any of the characteristics that make it eligible for listing in the NRHP in a manner that would diminish the integrity of the historic property.

Adverse Effect: An adverse effect indicates the undertaking would alter, directly or indirectly, any of the characteristics that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of the property.

4.3.2 Direct and Indirect Impacts of the Proposed Action

Under NEPA, effects to historic properties can be direct or indirect. Direct effects are caused by an undertaking and occur at the same time and place (40 CFR 1508.8[a]). These types of effects include physical damage resulting from surface disturbing activities and can occur to both known sites and subsurface sites. Indirect effects are caused by an undertaking and are later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8[b]). These types of effects often are not quantifiable and can occur both within and adjacent to the direct effects APE. Indirect effects to historic properties include, but are not limited to, changes in erosion patterns due to construction activities, inadvertent damage due to off-road maintenance traffic, and illegal artifact collection due to increased numbers of people in the Project area. Other potential indirect effects can include the introduction of visual or auditory elements out of character with a historic property that disrupts the property's setting.

Cultural resources potentially indirectly affected by the Proposed Action and its alternatives include archaeological, historic, and architectural resources within the indirect APEs as defined above. Resources that partially overlap both the direct APE (proposed Plan) and one or more indirect APEs are addressed through the analysis of the direct effects APE.

Potential Direct Effects

Based on the Class III inventories, a total of 16 prehistoric sites, 45 historic sites, and 15 multi-component sites were identified in the direct effects APE (**Table 4.3-1**). Of the 16 prehistoric sites and 15 prehistoric components, three of the prehistoric sites and eight of the prehistoric components were recommended as eligible for the NRHP. The remaining prehistoric sites and prehistoric components were recommended as not eligible. Of the 45 historic sites and 15 historic components, 33 historic sites and 10 historic components were recommended as eligible for the NRHP. The remaining sites and historic components were recommended as not eligible for the NRHP. As described in Section 3.3.4.1, the employee parking area was inventoried in 2013, and one eligible historic site was identified. All of the NRHP-eligible sites (i.e., historic properties) within the direct effects APE potentially would be impacted by the Proposed Action. However, the parking area would be utilized/designed to avoid all impacts to the historic property on the parcel. Should inadvertent impacts occur from MMI activities, mitigation of those adverse effects would be addressed through the protocols outlined in the MOA and coordinated with the existing treatment plan.

Table 4.3-1 Cultural Resources Located Within the Direct Effects APE

Site Type	Not Eligible[1]	Eligible[2, 3]	Total
Historic	12	33[2]	45
Prehistoric	13	3	16
Multi-Component	3	12	15
Historic components	5	10	15
Prehistoric components	7	8	15
Total	**28**	**48**	**76**

Source: Chambers, 2015; Hansen and Harmon, 2016; and ASC, 2013
[1] Not eligible historic sites include the segment of the Pony Express NHT within the direct effects APE.
[2] Thirty-two of the NRHP-eligible historic sites and the 12 NRHP-eligible multi-component sites also are recommended as contributing elements of the RMCD.
[3.] Eligible historic sites include t the one historic site identified at the parking area.

Although effects to historic properties are determined on a site-specific basis, certain activities associated with the Proposed Action would have a greater potential to adversely affect the sites located within the direct effects APE. Activities that could result in direct effects to historic properties include ground-disturbance associated with development of the mine area, blasting vibrations, construction of haul roads and ancillary facilities, and the use of staging areas for storage of equipment and supplies. These effects could result in the vertical and horizontal displacement of soil containing cultural materials and the resulting loss of integrity, loss of information, and the alteration of the site setting. Vegetation clearing also could directly affect historic properties by compacting soils, crushing artifacts, disturbing historic features, or displacing cultural material from its original context.

Potential indirect effects to historic properties located within or adjacent to the direct effects APE could include erosional effects from runoff or mine water discharge and illegal collection, inadvertent damage, and vandalism due to increases in both surface disturbance and the number of people in the Project area. Other potential indirect effects could include the introduction of visual or auditory elements that would be out of character with a site and disrupt the site's setting. Visual and auditory effects to the Pony Express NHT could occur because of the Proposed Action. A segment of the trail is located approximately two miles southeast of the Plan boundary. Under the Proposed Action, traffic would increase on both Roberts Creek Road and Three Bars Road during shift changes. Increased traffic could impact the setting and feeling of trail users during these times (Section 4.9). This impact would be short-term and have no adverse effect, and would only be noticeable during shift changes.

The potential for the discovery of previously unidentified cultural resources during construction activities exists within proposed disturbance areas and could result in direct effects. Unanticipated discoveries could result in displacement or loss (either complete or partial) of the discovered material. Displacement of archaeological deposits affects the potential to understand the context of the site and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns.

Potential Indirect Visual Effects

The indirect APE for visual impacts resulting from the facilities within the Plan boundary encompasses the portions of a seven-mile buffer around the boundary from which the proposed facilities would be visible. Resources that have the potential to be adversely affected by changes to the existing viewshed are those resources that qualify, or may qualify, for inclusion on the NRHP for their qualities of setting and feeling, and to a lesser degree association. Consequently, resources that qualify, or may qualify, for inclusion on the NRHP for their data potential only would not be adversely affected by changes to the existing viewshed. A total of 668 archaeological sites and zero architectural resources have been documented previously within the visual indirect APE. A segment of the Pony Express Trail and portions of the Robert Mountains Charcoal Production Historic District also are located in the visual APE. Those resources previously determined not eligible for inclusion on the NRHP would be removed from consideration. Effects to properties previously determined eligible or unevaluated for the NRHP would be assessed individually. No properties listed on the Nevada State or National Registers of Historic Places are located within the visual APE. Review of historic maps and historic aerial photographs yielded five locations potentially containing undocumented historic architectural resources. These include the Roberts Creek Ranch, Tonkin's House and Barn, Three Bars Ranch, an unknown structure east of the Plan boundary, and extant structures at the Mount Hope Mine. These resources remain unevaluated and impacts resulting from visual changes to the landscape must be considered.

Potential Indirect Vibrational Effects of the Proposed Action

The indirect APE for vibrational impacts is a one-mile buffer around the Plan boundary. Significant portions of this buffer were inventoried to Class III standards by Chambers Group, Inc., between 2010 and 2013. A total of 146 archaeological sites and zero architectural resources have been documented previously within the vibrational indirect APE. One historic district, the Roberts Mountains Charcoal Production District, also is located in the vibrational APE. Those resources previously determined not eligible for inclusion on the NRHP would be removed from consideration. Effects to properties previously determined eligible or unevaluated for the NRHP would be assessed individually. Potential adverse effects from vibrations include loss of structural integrity for standing structures or rock art panels, or loss of associational integrity from un-intended ground movement. No properties listed on the Nevada State or National Registers of Historic Places are located within the APE, and review of historic maps and historic aerial photos failed to yield locations of potentially un-documented historic architectural resources.

Potential Indirect Auditory Effects of the Proposed Action

The indirect APE for auditory impacts is a three-mile buffer around the Plan boundary. Significant portions of this buffer were inventoried to Class III standards by Chambers Group, Inc., between 2010 and 2013. Resources that have the potential to be adversely affected by changes to existing auditory values are those resources that qualify, or may qualify, for inclusion on the NRHP for their qualities of setting and feeling. Consequently, resources that qualify, or may qualify, for inclusion on the NRHP for their data potential only would not be adversely affected by changes to existing auditory values. A total of 350 archaeological sites and zero architectural resources have been documented previously within the auditory indirect APE. One of the archaeological sites is a segment of the Pony Express Trail, designated as a National Historic Trail by the

National Park Service. The Roberts Mountains Charcoal Production District also is located in the auditory APE. Those resources previously determined not eligible for inclusion on the NRHP would be removed from consideration. Effects to properties previously determined eligible or unevaluated for the NRHP would be assessed individually. No properties listed on the Nevada State or National Registers of Historic Places are located within the APE. Review of historic maps and historic aerial photographs yielded two potentially undocumented architectural resources; the Robert's Creek Ranch located 1.3 miles southeast of the proposed Plan boundary, and Tonkin's barn and house located two miles west of the Plan boundary. These resources remain unevaluated and impacts resulting from auditory changes to the landscape must be considered.

Resolution of Effects

In consultation with the Nevada SHPO, the BLM would determine whether construction and operation of the Project would have an adverse effect on any historic properties. If the BLM determines that a property would be adversely affected, then avoidance would be recommended. If avoidance is not feasible, measures to minimize or mitigate effects would be proposed in accordance with a Memorandum of Agreement (MOA) and detailed in a HPTP developed in coordination with the SHPO. Mitigation would be based on the types of impacts relevant to the site type. Measures to minimize or mitigate effects may include, but would not be limited to, one or more of the following:

- Data recovery, which might include the systematic professional excavation and removal of archaeological resources;
- The use of landscaping or other techniques that would minimize or eliminate visual effects on a historic property's setting;
- Development of site-specific interpretive materials (e.g., leaflets, brochures); or
- Other mitigation determined by the BLM through consultation with the SHPO.

For those cultural resources that do not meet the criteria of NRHP eligibility, but may be significant to Native American tribes (e.g., sacred sites), the BLM, in consultation with interested tribes would determine the appropriate means to avoid, minimize, or mitigate impacts on a case-by-case basis.

The MOA would serve three primary purposes: (1) specify the mitigation agreed upon by the BLM and SHPO; (2) identify who is responsible for carrying out the specified mitigation measures; and, (3) serve as evidence that the BLM has complied with Section 106. In general, the MOA developed for the Project would:

- Identify the Project;
- Cite the legal authority of the MOA and the names of the parties entering the agreement; and
- Include stipulations stating the agreed-upon mitigation and/or monitoring and identify who is responsible for carrying out the mitigation and/or monitoring.

For sites eligible under National Register Criteria A, B, or C, other forms of mitigation (e.g., historic markers, interpretive brochures, or publications) may be considered in the HPTP in lieu of, or in addition to, data recovery. If data recovery is the preferred treatment option for a site, then the BLM would ensure that the developed treatment is based on an appropriate research design and is reviewed and approved by the BLM and SHPO. Following approval by the BLM and SHPO, the BLM would ensure that the HPTP is implemented within the timelines set forth in the plan. If data recovery is proposed for a site of tribal importance, notification, and, as appropriate, consultation with interested tribes would be conducted prior to issuance of the ARPA permit for removal/excavation of archaeological resources. The BLM would require as a condition of approval or authorization that MMI completes the fieldwork portions of the HPTP prior to initiating any activities that may affect historic properties.

Potential indirect effects to historic properties located within or adjacent to the direct effects APE because of erosion and sediment transport are anticipated to result in no adverse effect based on BMPs (e.g., erosion and sediment control structures, vegetative soil, and slope stabilization) that would be used during construction, operations, and initial stages of reclamation (EPMs, Section 2.2.20). This does not preclude erosion effects associated with natural occurrences (i.e., rain, wind) that may occur in areas where mining activities have disturbed the soil or removed vegetation.

A viewshed analysis was conducted along the segment of the Pony Express NHT closest to the mine boundary. The reader is referred to Section 4.9, Historic Trails, for this discussion, which contains visual simulations of the both the existing disturbance and proposed disturbance as seen from the viewshed analysis locations. As stated previously in Section 3.3, Cultural Resources, the segments of the Pony Express Trail immediately adjacent to the Plan boundary have been determined non-contributing to the significance of the overall Pony Express Trail. However, other segments of the Pony Express Trail within the indirect APE have been determined to be contributing elements to the overall significance of the Trail, or currently remain un-documented and un-evaluated for their contribution to the Pony Express Trail's significance. If effects to the contributing or currently un-evaluated segments of the Pony Express Trail are determined to be adverse, those effects would be minimized or mitigated through the development and implementation of a treatment plan. If the BLM and SHPO agree with the recommendation and determine that visual effects to the integrity of the trail's setting, feeling, and association would occur as a result of the Proposed Action, the effects would be minimized or mitigated as detailed in an HPTP. Existing mine disturbance is visible from the Pony Express NHT. Although the Proposed Action would include additional disturbance that would be visible, reclamation of existing and proposed disturbance would mitigate and lessen current impact.

Auditory or noise impacts to the Pony Express NHT were assessed as part of the ambient noise assessment conducted at two sites within 0.5 mile of the trail. According to the noise study, ambient noise levels would increase by as much as 10 decibels (A-weighted) from operation of the Project. The major contributor to the increase in noise would be the generators. An increase of 10 decibels in close proximity to the trail would be noticeable in comparison to existing noise levels. The reader is referred to Sections 4.9 and 4.12 for additional information on noise impacts

to the trail. If the BLM and SHPO determine that auditory effects to the integrity of the trail's setting, feeling, and association would occur as a result of the Proposed Action, the effects would be minimized or mitigated as detailed in an HPTP.

The results of the assessment of effects to historic properties located within the indirect APEs as defined in Section 3.3.1 would be provided to BLM in report format with all necessary supporting documentation. BLM would review the report, provide comments, and once that agency has made determinations of effects, the report will be submitted to Nevada SHPO for consultation and concurrence. The final results of the indirect APE analysis would be incorporated into the FEIS for the proposed mine project.

The potential for the discovery of previously unidentified cultural resources during construction activities exists within proposed disturbance areas and could result in direct effects to these unanticipated discoveries. Per the MOA and EPMs (Section 2.2.20), if any previously unknown cultural resources are discovered during Project construction, all construction activities would cease within 300 feet of the discovery and the BLM Authorized Officer would be notified of the find. Steps would be taken to protect the site from vandalism or further damage until the BLM Authorized Officer could evaluate the nature of the discovery. If the previously unidentified cultural resource is determined eligible for the NRHP, adverse effects would be minimized or mitigated as outlined in an HPTP. Construction would not resume in the area of the discovery until the BLM Authorized Officer has issued a Notice to Proceed.

Per the MOA, if construction or other Project personnel discover what may be human remains, funerary objects, or items of cultural patrimony on BLM-administered land, all construction activities would cease within the vicinity of the discovery. The location of the find would not be publicly disclosed, and the remains would be secured and preserved in place. MMI or its contractors would immediately notify the BLM Authorized Officer of the discovery, followed by written notification. Construction would not resume in the area of the discovery until the BLM Authorized Officer has issued a Notice to Proceed.

Direct effects to historic properties, including unanticipated discoveries, would be minimized, or mitigated in accordance with the MOA, HPTP, EPMs, and any additional mitigation measures determined by the BLM in consultation with the SHPO. Indirect effects such as illegal collecting and/or inadvertent damage potentially would occur because of increased human activity in the Project area. Under the Proposed Action, direct and indirect effects to historic properties within the direct effects APE are anticipated to be localized, short-term, and would result in no adverse effect with the implementation of the MOA.

4.3.2.1 Unavoidable Adverse Impacts

Unavoidable adverse effects to historic properties identified within the APE would be minimized or mitigated in accordance with the MOA, HPTP, and EPMs (Section 2.2.20). Any previously unknown cultural resources that may be discovered during construction activities would be treated as outlined in the unanticipated discoveries plan included in the MOA and EPMs.

With implementation of the stipulations outlined in the MOA and with implementation of the HPTP and EPMs, unavoidable adverse impacts to historic properties are not anticipated as a result of the Proposed Action.

4.3.2.2 Irreversible and Irretrievable Commitments of Resources

Historic properties could be irreversibly and irretrievably lost if inventory, avoidance, and/or mitigation efforts are not sufficient to identify and protect these resources. Any loss of data associated with an historic property would constitute an irreversible and irretrievable commitment of that resource, and a loss of information that could have been added to the local and regional archaeological databases. Mitigation through data recovery would recover valuable information about an historic property, but the property ultimately would be subsumed by Project construction. The loss of the physical location of a property would constitute an irreversible and irretrievable commitment of that resource.

4.3.2.3 Relationship of Short-Term Uses and Long-Term Productivity

For historic properties located in proposed disturbance areas that cannot be avoided, data recovery or other mitigation would be conducted prior to Project construction. The scientific information obtained through mitigation would be preserved for the long term, yet the site itself ultimately would be lost. There would be a potential for the long-term loss of cultural resources due to illegal collecting and vandalism associated with increased human activity in the Project area.

4.3.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Potential Direct Effects

Impacts to the 76 cultural resources within the Plan boundary would be the same as those described under the Proposed Action. In addition, 21 sites are located within the 25kV overhead distribution line including three prehistoric-era sites, 15 historic-period sites, and three multi-component sites. Of these, one prehistoric site, one prehistoric component, and one historic site are recommended eligible for the NRHP. The remaining sites are recommended as not eligible.

A segment of the Pony Express NHT would be crossed by this alternative. The viewshed analysis included three locations along the segment of the trail and in view of the proposed distribution line (Sections 3.9 and 4.9; **Figures 3.9-1** through **3.9-3**). Results of the noise study indicate no measurable changes in the existing noise levels under this alternative (Section 4.9, Historic Trails). Results of the noise study conducted within 0.5 mile of the Pony Express NHT indicate no measurable changes in the existing noise levels under this alternative. For an expanded discussion of the noise study, the reader is referred to Section 4.12. It should be noted that the overhead distribution line would cross the Roberts Creek Ranch, which was the site of the Old Overland Mail Station. Currently, the Roberts Creek Ranch operates as a cattle ranch. Remnants of historic structures at Robert Creek Ranch are currently unverified. The presence of historic structures, and assessment of effects to them, would be verified as part of the indirect effects assessment, and would be incorporated into the FEIS.

Under this alternative, a total (including the Proposed Action) of 51 NRHP-eligible sites and components (i.e., historic properties) would be impacted (**Table 4.3-2**). The types of direct and indirect impacts to these historic properties that could occur under this alternative would be the same as those described for the Proposed Action. If any historic property would be directly or indirectly affected by this alternative, measures to minimize or mitigate the effects would be the same as those described for the Proposed Action so impacts would be localized, short-term, and would result in no adverse effect with the implementation of the MOA.

Table 4.3-2 Total Cultural Resources Located Within the 25 kV Overhead Distribution Line Alternative Direct Effects APE and the Proposed Action Direct Effects APE

Site Type	Not Eligible[1]	Eligible[2, 3]	Total
Historic	26	34	60
Prehistoric	15	4	19
Multi-Component	5	13	18
Historic components	8	10	18
Prehistoric components	9	9	18
Total	**46**	**51**	**97**

Source: Chambers, 2015; Hansen and Harmon, 2016; and ASC, 2013
[1] Not eligible historic sites include the segment of the Pony Express NHT within the direct effects APE.
[2] Thirty-two of the NRHP-eligible historic sites and the 12 NRHP-eligible multi-component sites also are recommended as contributing elements of the RMCD.
[2,] Eligible historic sites include the one historic site identified at the parking area.

Potential Indirect Visual Effects

The indirect APE for visual impacts resulting from the proposed powerline encompasses the portions of a three-mile buffer on either side of the powerline from which the proposed facility would be visible. Resources that have the potential to be adversely affected by changes to the existing viewshed are those resources that qualify, or may qualify, for inclusion on the NRHP for their qualities of setting and feeling, and to a lesser degree association. Consequently, resources that qualify, or may qualify, for inclusion on the NRHP for their data potential only would not be adversely affected by changes to the existing viewshed. A total of 606 archaeological sites and 173 architectural resources have been documented previously within the visual indirect APE. A segment of the Pony Express Trail, portions of the Robert Mountains Charcoal Production Historic District, and NRHP listed Eureka Historic District also are located in the visual APE for the Plan boundary. Of the 147 documented architectural resources, 146 are located within the boundaries of the Eureka Historic District, 26 are located at the Fad shaft complex, and one is at the Hays Ranch. Those resources previously determined not eligible for inclusion on the NRHP would be removed from consideration. Effects to properties previously determined eligible or unevaluated for the NRHP would be assessed individually. Review of historic maps and historic aerial photographs yielded seven locations potentially containing undocumented historic architectural resources. These include the Roberts Creek Ranch, Nichol's House, Morrison's House, Willow's House, one unknown structure, one house lacking a surname, and the Eureka Airport. These

resources remain unevaluated and impacts resulting from visual changes to the landscape must be considered.

4.3.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be like those identified for the Proposed Action.

4.3.3.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources would be the same as described for the Proposed Action.

4.3.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between local short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.3.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Direct and indirect impacts associated with the this alternative would be the same as described for the Proposed Action: localized, short-term, and would result in no adverse effect with the implementation of the MOA. A segment of the Pony Express NHT is crossed by the existing Three Bars Road.

4.3.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be similar to those identified for the Proposed Action.

4.3.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources would be the same as described for the Proposed Action.

4.3.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between local short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.3.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action: localized, short-term, and would result in no adverse effect with the implementation of the MOA. However, access under

this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. Direct and indirect impacts associated with this alternative would be the same as described for the Proposed Action.

4.3.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be similar to those identified for the Proposed Action.

4.3.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources would be the same as described for the Proposed Action.

4.3.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between local short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.3.6 Direct and Indirect Impacts of the No Action Alternative

Under the this alternative, the Project would not be implemented and no impacts to historic properties as identified for the Proposed Action would occur. However, seven prehistoric sites, 11 historic sites, and seven multi-component sites have been identified within the area of authorized Notice-level exploration activities. Of these 25 cultural resources, 10 historic sites, two prehistoric sites, and seven multi-component sites (**Table 3.3-4**) are recommended as eligible for the NRHP. Although exploration activities are exempt from Section 106, these activities fall under the purview of BLM's standard stipulations issued for exploration activities. The stipulations detail the penalties if any unnecessary or undue degradation to cultural resources on federal lands should occur, and additionally detail the actions to be taken in the event cultural resources, including human remains, funerary objects, and sacred items, are discovered during the activities. With implementation of and compliance with BLM's standard stipulations issued for exploration activities, adverse effects to historic properties, including unanticipated discoveries, would not be anticipated under this alternative. Impacts are anticipated to be localized, short-term, and would result in no adverse effect.

4.4 Environmental Justice

4.4.1 Indicators

EPA's Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses (USEPA, 1998) suggests a screening process to identify environmental justice concerns. The two step process includes:

1) Does the potentially affected community include minority or low-income populations?

2) Are the environmental impacts likely to fall disproportionately on minority or low-income members of the community or tribal resource?

If the two-step process indicates that a potential exists for environmental justice effects to occur, analyses are conducted to consider the following:

- Whether there exists a potential for disproportionate risk of high and adverse human health or environmental effects;
- Whether communities have been sufficiently involved in the decision-making process; and
- Whether communities currently suffer, or have historically suffered, from environmental hazards.

Effects Context for Environmental Justice

Localized: Effects would occur within the area of analysis for environmental justice (i.e., Eureka CCD, which includes the Town of Eureka).

Regional: Effects would occur across all of Eureka County.

Duration of Effects Definitions for Environmental Justice

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Intensity of Effects Definitions for Environmental Justice

Negligible: There would be no environmental, health, or socioeconomic impacts, or impacts would be non-detectable, to minority or low-income communities relative to the total population of the area of analysis.

Minor: Environmental, health, or socioeconomic effects on minority or low-income communities would occur, and would be perceptible, but impacts would be localized with little to no consequence to minority or low-income groups when compared to the total population of the area of analysis. Impacts would occur across the entire population of the area of analysis rather than solely on the minority or low income population.

Moderate: Environmental, health, or socioeconomic effects on minority or low-income groups would occur and would be readily apparent, measurable, but localized with moderate consequence. The project would noticeably impact minority and low income communities more than the total population of the area of analysis.

Major: Environmental, health, or socioeconomic effects would be predominately born by minority or low-income communities, and the impacts would not be equally distributed among the entire population of the area of analysis.

4.4.2 Direct and Indirect Impacts of the Proposed Action

The Proposed Action would not be expected to disproportionately affect any particular population. The area in the immediate vicinity of the Project is sparsely inhabited, with the nearest residence (Roberts Creek Ranch) located approximately 1.5 miles to the southeast of the mine facilities. The nearest residential communities are located in Diamond Valley, approximately 15 miles east and southeast of the mine facilities, and the Town of Eureka, approximately 25 miles southeast of the mine facilities.

As described in detail in Section 3.4, the minority and low income populations within the area of analysis are not meaningfully greater than in Eureka County or the State of Nevada. The area of analysis does not have an unusually high minority or low-income population, but it does have a substantially greater proportion of those who identify themselves as “white” compared to the rest of the State of Nevada (**Table 3.4-1**). Environmental effects may occur at a distance from the Project area, such as noise or air quality impacts, would affect the area’s population equally, without regard to nationality or income level.

The final guidance by the EPA also requires consideration of “impacts that may affect a cultural, historical, or protected resource of value to an Indian Tribe or a minority population, even when the population is not concentrated in the vicinity” (USEPA, 1998). Sections 4.3 and 4.11 provide a detailed analysis of cultural resources and Native American cultural concerns.

Implementation of the Proposed Action would result in the creation of approximately 135 new job opportunities during construction and operation of the Project. The new job opportunities would offer the potential for increased employment opportunities within the area of analysis. Increased employment may result in increased per capita income and median household income in the area of analysis, which may lessen the difference between these two indicators when compared to the entire Eureka County (**Table 3.4-2**). Consequently, the percentage of persons below the poverty level in the area of analysis may be reduced. This would be a localized, short-term, minor but beneficial impact. However, these beneficial effects would be distributed equally to all populations within the area of analysis, and not just those below the poverty level.

Impacts from the Proposed Action on environmental justice populations would be negligible, and the Proposed Action would not result in a disproportionate effect on a minority population or low income population. No further environmental justice analyses are required because there is no disproportionate effect on an identified minority or low income population because of the Proposed Action.

4.4.2.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts on environmental justice would be unlikely to occur because of implementation of the Proposed Action. Adverse human health and environmental effects, even those typically extending farthest from mining projects, would be anticipated to dissipate before reaching any minority or low-income population, and they would affect the area’s population equally, without regard to nationality or income level.

4.4.2.2 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and/or irretrievable commitments of resources that disproportionately burden any minority or low-income population within the area of analysis.

4.4.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The Proposed Action would affect various environmental resources during the life of the Project. However, none of the short-term uses or long-term effects on the productivity of other resources would disproportionately affect minority or low-income populations within the area of analysis.

4.4.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Impacts from this alternative would be the same as the Proposed Action. The 25 kV line would largely follow existing power line corridors, reducing impacts to any adjacent communities from the visual or aesthetic impacts from overhead power lines. The construction of the power line would not disproportionately impact any low income or minority communities within the area of analysis.

4.4.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts from this alternative would be the same as the Proposed Action.

4.4.3.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources from this alternative would be the same as the Proposed Action.

4.4.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity associated with this alternative would be the same as the Proposed Action.

4.4.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Impacts from this alternative would be the same as the Proposed Action.

4.4.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts from this alternative would be the same as the Proposed Action.

4.4.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources from this alternative would be the same as the Proposed Action.

4.4.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity associated with this alternative would be the same as the Proposed Action.

4.4.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access.

4.4.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts from this alternative would be the same as the Proposed Action.

4.4.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources from this alternative would be the same as the Proposed Action.

4.4.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity associated with this alternative would be the same as the Proposed Action.

4.4.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. Impacts to an environmental justice population would be negligible.

4.5 Forest Products

4.5.1 Indicators

Indicators for significant effects to forest resources focused on the duration and acreage of vegetation community disturbance, biological importance of the resource, and susceptibility to disturbance. The Proposed Action or alternatives would be considered to have impacts on forest products if one or more of the following occurred:

- Conflicts with existing federal, state, or local laws, management plans, or policies; or

- Changes in access to or substantially affect existing fuel wood cutting, Christmas tree cutting, or pine nut harvest areas.

Effects Context for Forest Products

Localized: Impacts would occur within the Project area.

Regional: Impacts would occur outside of the disturbance area, and would correlate with the cumulative impacts study area.

Duration of Effects Definitions for Forest Products

Short-Term: Less than 10 years, which correlates to when revegetation would be completed after mining operations cease (i.e., seven-year life-of-mine), and native vegetation communities would begin to re-establish.

Long-Term: Greater than 10 years, which correlates to the final closure period of mining operations and the longer period of time required for woodland species to re-establish.

Intensity of Effects Definitions for Forest Products

Negligible: Effects on forestry and woodland resources would either not occur, or impacts would not be detectable; use of and access to woodland products would continue to be provided.

Minor: Effects on forestry and woodland resources would occur and would be detectable, measurable, and perceptible but localized, and of little consequence. Applicant-committed EPMs and BMPs would offset adverse effects and allow for continued use of and access to woodland products. Reclamation would assist with the restoration of woodland communities in the long-term.

Moderate: Effects on forest products would be readily apparent and may alter the resource use. Additional mitigation beyond applicant-committed EPMs and BMPs may be necessary to reduce adverse effects, but would most likely be effective.

Major: Effects on forest and woodland resources would occur and would substantially change the resource use. Additional mitigation may be necessary beyond applicant-committed EPMs, and they would need to be monitored to determine their effectiveness.

4.5.2 Direct and Indirect Impacts of the Proposed Action

Forest Communities

Direct impacts of the Proposed Action would include removal of approximately 649 acres of woodland communities. Loss of woodland would result from construction of process facilities and ponds, shop facilities, administration buildings, laydown yards, pit excavations, WRDAs, HLP, growth media stockpiles, landfill, sediment basins, and improvement or construction of roads. Most disturbance would come from the WRDAs, open pits, and the HLP. The tops of the WRDAs and HLP would be reclaimed with herbaceous and shrub species; impacts to woodland communities would last 50 to 100 years until woodland species succeed (gradually replace)

species planted during reclamation. The open pits would not be backfilled and only perimeter berms surrounding the pit perimeters would be revegetated. Reclamation is described in detail in Section 2.2.19. **Table 4.5-1** shows the acreage disturbed for each woodland community within the Plan boundary.

Table 4.5-1 Woodland Community Disturbance from the Proposed Action

Woodland Community	Acres within Plan Boundary	Proposed Disturbance (acres)	Percent of Total Project Disturbance in Woodland Communities	Proposed Reclamation (acres)	Proposed Permanent Disturbance (acres)
Curl-leaf Mountain Mahogany Woodland	1,189	167	26	117	50
Limber Pine	8	0	0	0	0
Pinyon/Juniper Woodland	3,321	482	74	467	15
Total	**4,517[1]**	**649[1]**	**100**	**584[1]**	**65[1]**

Note: There are 65 acres of exploration which may occur within any vegetation community type and is not accounted for in this table.
[1] Total acreage includes woodland communities and does not include all vegetation communities mapped in the area. As a result, acreages will not add up to total project disturbance (1,129 acres) or total acres within Plan boundary (5,561 acres).

None of the woodland or forest community types within the Plan boundary are considered unique or rare. These tree-dominated communities are prevalent in areas adjacent to the Project and throughout central Nevada. Additionally, there are 660 acres (654 acres of past mining related disturbance and approximately six acres of existing North Roberts Creek Road) within the Plan boundary has previously been disturbed as a result of exploration and mining activities.

The limber pine community is present in a limited area (approximately eight acres) within the Plan boundary; however, the Proposed Action would not disturb this community.

The Proposed Action would result in the direct removal of approximately 482 acres of pinyon-juniper woodlands, of which 467 acres would be reclaimed after mining to a grass and forb dominated community, and eventually a shrub dominated community depending on success of reclamation. This vegetation community is abundant on public lands in the area surrounding the Proposed Action. The direct impact of removal of singleleaf pinyon and Utah juniper would be localized, long-term and minor.

The Proposed Action would remove approximately 167 acres of curl-leaf mountain mahogany woodland, of which 117 acres would be reclaimed. Curl-leaf mountain mahogany would not be planted or seeded as part of the reclamation, although surrounding trees could provide a seed source. The direct impact of removal of mahogany woodlands would be localized, long-term and minor.

The Proposed Action would directly impact access to woodland harvest within the Plan boundary. Pine nut harvesting, fuel wood cutting, and Christmas tree cutting is permitted anywhere on public lands, including inside the Plan boundary; however, MMI could exclude woodland harvest around the mine facilities. The direct impact to the access to woodland harvest would be localized, long-term and minor.

Indirect impacts from removal of woodland communities, because of the Proposed Action, include potential increased soil erosion potential and encroachment of noxious weed and non-native invasive species into disturbance areas. Impacts to these resources, as a result of the Proposed Action, are discussed in their respective sections of this EIS. Indirect impacts to forest products would be localized, long-term and minor.

Use of the parking area in the town of Eureka would have negligible impacts to woodland communities or forest products since it is already improved.

Pine Nut Harvest

The direct impact of the removal of 482 acres of pinyon-juniper woodlands would decrease the amount of pinyon pine nuts available for harvest long-term. Although,467 acres would be reclaimed with a grass/forb/shrub seeding mix, 15 acres would not be reclaimed. Additionally, the reclaimed areas would need to re-establish pinyon trees (approximately 50 to 100 years) before pinyon pine nuts could be harvested. Approximately 2,839 acres of pinyon-juniper woodland would not be disturbed within the Plan boundary; therefore, permits could still be requested to collect pinyon pine nuts in this area (Cork, 2015). No indirect impacts to pine nut harvesting are anticipated.

Fuel Wood Cutting

The direct impact of the removal of 167 acres of curl-leaf mountain mahogany woodland and 482 acres of pinyon-juniper woodland would decrease the amount of fuel wood (green and dead) available for personal and commercial firewood harvest, both in the short- and long-term. Although, there are currently no interests of firewood cutting within the Plan boundary, someone could request a commercial firewood permit in this area (Cork, 2015). No indirect impacts to fuel wood cutting are anticipated.

Christmas Tree Cutting

Christmas tree cutting permits allow for pinyon or juniper trees to be cut. Direct impacts to the removal of 482 acres of pinyon-juniper woodland would decrease the number of trees available for harvest in the long-term. However, there would be approximately 2,839 acres remaining available for harvest; therefore, both commercial and personal permits may continue to be requested within the Plan boundary. No indirect impacts to Christmas tree cutting are anticipated.

Overall, impacts to forest products would be localized, long-term and minor. Approximately 584 acres within the woodland vegetation communities would be reclaimed and revegetated, which would minimize the impacts to forest products. Un-reclaimed features include pits, ponds, some roads, and stormwater diversion channels, totaling 65 acres of disturbance areas within woodland

communities within the Plan boundary. Reclamation is anticipated to be completed within six years following cessation of mining and residual leaching; however, prolonged drought could delay revegetation activities. Reclamation and revegetation activities are outlined in Section 2.2.19.

4.5.2.1 Unavoidable Adverse Impacts

The Proposed Action would permanently remove 65 acres of woodland communities, which would not be reclaimed after mine closure. Of these 65 acres, 50 acres are curl-leaf mountain mahogany and 15 are pinyon-juniper woodland.

4.5.2.2 Irreversible and Irretrievable Commitments of Resources

The curl-leaf mountain mahogany and pinyon-juniper woodlands removed due to disturbance from the Proposed Action would take approximately 50 to 100 or more years to establish within the reclaimed areas. However, the pinyon-juniper woodland is not a rare or unique community type and 2,839 acres of pinyon-juniper woodland would not be disturbed within the Plan boundary. Additionally, 1,022 acres of the curl-leaf mountain mahogany woodland would not be disturbed within the Plan boundary.

4.5.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The removal of forest products would reduce availability of these resources for use by wildlife, as well as use by people for harvesting of pine nuts, fuel wood, and Christmas trees in the short- and long-term. Additionally, long-term productivity of these communities could be increased or decreased in quantity and quality from existing conditions, based on the success of the reclamation.

4.5.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

In addition to the impacts to woodland products from mining and processing facilities, the 40-foot wide operation and maintenance ROW would directly remove approximately eight acres of pinyon-juniper woodland. The 80-foot wide temporary construction ROW would remove approximately 16 acres of pinyon-juniper woodland. The 80-foot wide temporary construction ROW is to be used during the six-month construction schedule for staging equipment and storing materials, and it is unlikely woodland products would be removed.

The 2013 GBE vegetation mapping survey and ReGAP land cover types (USGS, 2011) were used in these calculations. The loss of these acres reduce the number of trees available for pine nut harvest, fuel wood cutting, and Christmas tree cutting. Due to the large acreage of pinyon-juniper woodland available within the vicinity this loss is negligible in comparison to the regional supply. Revegetation would occur with this alternative; however, re-establishment of woodland species removed may take last 50 to 100 years.

No indirect impacts to forest products are anticipated from the implementation of the 25 kV Overhead Distribution Line.

Overall, impacts to forest products from the 25 kV overhead distribution line would be localized, long-term and minor.

4.5.3.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.5.3.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources to those described for the Proposed Action are anticipated for this alternative.

4.5.3.3 Relationship of Short-Term Uses and Long-Term Productivity

This alternative would add negligible short-term and long-term effects beyond those caused by the Proposed Action on forest products.

4.5.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Overall, impacts to forest products from this alternative would be localized, long-term and minor, the same as those described for the Proposed Action.

4.5.4.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.5.4.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources to those described for the Proposed Action are anticipated for this alternative.

4.5.4.3 Relationship of Short-Term Uses and Long-Term Productivity

No additional impacts to short-term use or long-term productivity of forest products to those described for the Proposed Action are anticipated for this alternative.

4.5.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field

road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. No improvements to Mount Hope mine access or well field roads are proposed for this alternative beyond what was previously authorized with the Mount Hope Project. Impacts from Mount Hope roads were analyzed in the 2012 Mount Hope Project FEIS (BLM, 2012a). Overall, impacts to forest products from this alternative would be localized, long-term and minor, the same as those described for the Proposed Action.

4.5.5.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.5.5.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources to those described for the Proposed Action are anticipated for this alternative.

4.5.5.3 Relationship of Short-Term Uses and Long-Term Productivity

No additional impacts to short-term use or long-term productivity of forest products to those described for the Proposed Action are anticipated for this alternative.

4.5.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. The vegetation types within the authorized Notice-level area include curl-leaf mountain mahogany, pinyon- juniper woodlands, and sagebrush. Notice-level activities (i.e., 16 acres of authorized disturbance) may occur within these vegetation types, so woodland species may be impacted by this alternative to a lesser degree than the Proposed Action.

The existing conditions would include the approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, reclamation would not occur on portions of this existing disturbance. This includes approximately 420 acres of existing disturbance that are proposed for reclamation under the Proposed Action. This may have long-term impacts to forest products because the existing disturbance would continue to lack appropriate understory vegetation to assist with regrowth of woodland species. Impacts to forest products from this alternative are expected to be localized, long-term and negligible.

4.6 Geology and Minerals

4.6.1 Indicators

Indicators for assessing impacts of the Project on geology and mineral resources would be the tons of rock mined, areal extent of the resources impacted, and regional mineral budget affected by the Proposed Action.

Effects Context for Geology and Minerals
Localized: Effects would be limited to the Project area.

Regional: Effects would extend beyond the disturbance area into the larger region.

Duration of Effects Definitions for Geology and Minerals
Short-term: Effects would last through the life-of-mine operations.

Long-term: Effects would extend beyond the life-of-mine operations.

Permanent: Effect to Geology and Minerals would be permanent.

Intensity of Effects Definitions for Geology and Minerals
Negligible: Effects to geologic resources would occur, but they would be so slight as to not be detectable.

Minor: Effects to geologic resources would occur; but they would be small and limited to resources within the Project boundary.

Moderate: Effects to geologic resources would occur, and would be readily detectable, of moderate size, and limited to the Project boundary.

Major: Effects to geologic resources would occur, and would be readily detectable, of large size, and would likely exceed the Project boundary.

4.6.2 Direct and Indirect Impacts of the Proposed Action

The Proposed Action would have direct and indirect impacts to the geology and mineral resources within the Plan boundary. The Proposed Action would entail mining approximately 72.5 million tons of waste rock and 13 million tons of ore at an average strip ration of 5.2 to 1 (waste to ore ratio) would be processed onsite, with WRDAs being placed in-pit where possible and adjacent to pits otherwise (SRK, 2015d). Less than one square mile of the host lithologies would be impacted by the Proposed Action; hundreds of square miles of the host lithologies have been identified in this part of Eureka County from the Simpson Park Range to the west of the area to the Sulphur Springs Range east of the project area (Roberts et al. 1967). The Proposed Action would ship offsite approximately 325,000 ounces of gold over the life of the project (SRK 2015d).

MMI proposes to use the clay-altered volcanics in the proposed Cabin Creek North Pit as a secondary liner for the HLP due to their clay content and high moisture holding capacity. Geochemical characterization of the clay-altered volcanics was completed by static acid-base accounting followed by MWMP analyses on geotechnical samples taken both within and adjacent to the proposed pit limits. The results of this testing confirm the material is not potentially acid generating and has a low potential to mobilize constituents under meteoric conditions (SRK, 2017). These results are consistent with geochemical test results for the limestone and

dolomite waste rock samples from the previous investigation (SRK, 2014a). Therefore, the volcanic unit is classified as Non-designated Waste and can be placed in the waste rock dump or used as a secondary liner for the HLP without restriction. French et al. (1996) have noted the volcanics at Cabin Creek are argillically altered and weakly mineralized, but subsequent drilling by Atlas and MMI have shown the volcanic unit in the area is absent of any gold mineralization (SRK, 2017).

Placement of the dumps within and immediately adjacent to the remnant open pits would impact the future development of mineral resources that may remain in the pitwalls. This impact could be considered both direct and indirect in that it would imply there would not be any gold resources left in the pit; the decision of whether to mine all the resource under the Proposed Action or whether to leave some resource behind would be based on the market conditions at that time.

The HLP would remain post-closure; it would be capped and revegetated as part of the reclamation. It would effectively inhibit development of mineral resources that may be discovered underneath it at some future time.

The Atlas Haul Road would not impact the in-place geology and mineral resources because no further disturbance of this access is proposed beyond necessary maintenance of the roadway within the existing roadbed prism. Off-site aggregate would be imported for road maintenance.

North Roberts Creek Road improvements would impact Quaternary alluvial and colluvial sediments to the extent of surface re-grading to a 15-foot wider footprint for the roadbed prism. Roberts Creek Road and Three Bars Ranch Road accesses' maintenance would impact Quaternary alluvial and colluvial sediments. These Quaternary sediments are widespread throughout the region. No loss of significance of this resource would be incurred by this activity.

The water pipeline from the wells to the Project would be constructed also in Quaternary alluvial and colluvial sediments. The Quaternary sediments are widespread regionally. No loss of significance would result to this resource as a result of this activity, and impacts would be considered localized, short-term, and negligible.

Use of the parking lot in the town of Eureka would have localized, negligible impacts on geology or mineral resources since it is already improved.

Faulting and Seismicity

The Project is in an area of relatively low seismic activity. The closest seismic activity that could exceed design parameters is located approximately 35 miles southeast of the Project in a fault system that is not structurally connected to the Project. Impacts to the Project due to regional seismic activity would be negligible.

Ground movement due to activities of the Proposed Action, e.g. reactivation of dormant faults due to blasting or ground vibrations from heavy equipment travel, would not be expected. Such

movement typically would require destabilization of low angle faults, e.g., through dewatering or excavation of metastable stratigraphic or structural zones, none of which has been proposed.

Geologic Hazards and Slope Stability

Failure analyses conducted on the mine pits, HLP, and WRDFs demonstrated that those facilities would be stable during standard operating conditions, closure conditions, and anticipated seismic conditions. The south end of the Ridge West WRDFs exhibited the lowest acceptable FOS. In the event that conditions changed unexpectedly during operations, MMI would modify designs to ensure that FOS would be acceptable therefore impacts are expected to be negligible.

Subsidence

There were no baseline investigations conducted to address subsidence potential that might arise from the Proposed Action. The need to conduct such studies is not apparent; subsidence typically results following underground mining, mine dewatering, or disturbance of heavily karsted terrain. None of these conditions would mandate subsidence investigations are present. Subsidence resultant from the Proposed Action would not be expected within the Proposed Action area, therefore impacts are not expected.

4.6.2.1 Unavoidable Adverse Impacts

Under the Proposed Action, there would be four mine pits that disturb 142 acres. The pits would cause a permanent unavoidable adverse impacts to the geology and mineral resources. Waste rock dumps containing some 73 million tons of rock would cover an additional 351 acres immediately adjacent to the mine pits, limiting access to any remaining underlying mineral resources. The waste rock dumps as planned would not disturb underlying lithologies but would cover them. The lined heap leach facility containing 13 million tons of ore would cover 106 acres and hinder access to any subsequently discovered underlying mineral resources (**Figure 2.2-16**).

4.6.2.2 Irreversible and Irretrievable Commitments of Resources

The Proposed Action would cause an irreversible commitment of the mineral resources, 325,000 ounces of gold, through extraction and sale of the commodity. This amount of gold constitutes a minor to negligible portion of the regional resource, estimated to be more than 100 million ounces (Kinetic Gold, 2014).

The mine pits, waste rock dumps and heap leach facility disturbances would constitute a practically irreversible commitment of underlying geologic and mineral resources. The disturbances constitute a fraction of a percent in the study area of the acreage containing the geologic and mineral resources. As such these areas of the Proposed Action involve a permanent minor to negligible portion of the regional geologic and mineral resource.

Disturbances caused by other facilities related to the Proposed Action are planned for reclamation following the cessation of the operation and would constitute an irretrievable commitment of the underlying geologic and mineral resources for the duration of the Project.

4.6.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The Proposed Action involves short to moderate-term uses of the mineral resources in the Project area. The long-term productivity of the Project area regarding minerals extraction would be incrementally impacted as the remaining mineral resources would remain.

4.6.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

This alternative would have the same impacts as the Proposed Action and additionally would impact the surface of colluvium and alluvium along the distribution line route. Approximately 24.5 miles of new disturbance, or 45 acres, would be created in the basin-fill sediments, in addition to re-disturbance of approximately 85 acres along existing distribution facilities during construction. The indirect impact would be limitation of access to bedrock lithologies underlying the distribution facilities constructed for this alternative. The disturbance and occupancy of an additional 45 acres of Quaternary to Holocene sediments would be a short-term, negligible impact on the geology and mineral resources of the area.

4.6.3.1 Unavoidable Adverse Impacts

This alternative would have the same unavoidable adverse impacts to the geology and mineral resources as those of the Proposed Action.

4.6.3.2 Irreversible and Irretrievable Commitments of Resources

The commitments of geological and mineral resources caused by this alternative would include the commitments of the Proposed Action. The construction of the overhead distribution line would constitute an irretrievable commitment of underlying geologic resources for the duration of the Proposed Action.

4.6.3.3 Relationship of Short-Term Uses and Long-Term Productivity

This alternative would add negligible short-term effects beyond those caused by the Proposed Action on the geologic and mineral resources.

4.6.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. This alternative would have the same direct and indirect impacts on the geologic and mineral resources as the impacts of the Proposed Action.

4.6.4.1 Unavoidable Adverse Impacts

The unavoidable adverse impacts of this alternative on the geology and mineral resources would be the same as those described for the Proposed Action.

4.6.4.2 Irreversible and Irretrievable Commitments of Resources

The commitments of geologic and mineral resources under this alternative would be irretrievable for the duration of the Proposed Action.

4.6.4.3 Relationship of Short-Term Uses and Long-Term Productivity

This alternative would impact the short-term uses and long-term productivity of the geology and mineral resources to the same extent as those impacts described for the Proposed Action.

4.6.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. This alternative would include the same direct and indirect impacts as those described for the Proposed Action. The maintenance activities during use of these existing roads, hosted in Quaternary and Holocene sediments, would have a short-term, negligible direct and indirect impact to the geology and mineral resources.

4.6.5.1 Unavoidable Adverse Impacts

This alternative would have the same unavoidable adverse impacts as those for the Proposed Action.

4.6.5.2 Irreversible and Irretrievable Commitments of Resources

This alternative would present an irretrievable commitment of the mineral resources underlying this alternative during the life of the mining operation.

4.6.5.3 Relationship of Short-Term Uses and Long-Term Productivity

This alternative would have negligible, short-term and long-term effects on the geology and mineral resources for the region similar to the Proposed Action. The long-term productivity of the resources would be available for use following completion of the operation.

4.6.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. No mining would occur, so there would be no additional exposure of lithologies in the existing mine pits. There would be no extraction of the gold reserves.

Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action). However, not reclaiming these areas would have no impact on gold reserves. No impacts to geology and minerals would occur from this alternative.

4.7 Grazing Management

This section presents resources related to grazing management, which include allotments and associated acreages found within the Plan boundary, and the permitted (active) AUMs associated with each allotment. The analysis area for direct, indirect resources includes the allotments within the Plan boundary.

4.7.1 Indicators

Impacts to rangeland resources were evaluated by considering if the Proposed Action or alternatives would result in:

- Change or loss of water availability that affects livestock grazing or distribution;
- Acres of vegetation/rangeland that would be affected, analyzed by allotment and pasture;
- Change in AUMs available during and after mining closure;
- Project components that would adversely affect livestock or livestock behavior; and
- Revenue loss from reduced AUMs.

Effects Context for Grazing Management

Localized: Effects would be limited to one site or a portion of one allotment.

Regional: Effects would occur throughout one or more allotments; multiple permittees may be affected.

Duration of Effects Definitions for Grazing Management

Short-term: Effects would not substantially alter the natural vegetation community, or would last for the duration of the Project.

Long-term: Effects would alter the natural vegetation community and would last for longer than the Project duration (e.g., during reclamation and vegetation re-establishment).

Duration of Effects Definitions for AUMs

Temporary: Reduction of active AUMs for the life of the Proposed Action to be returned to the permit once successful reclamation has been completed.

Permanent: Permanent reduction of AUMs and removed from permit. This would affect those areas that cannot be reclaimed.

Intensity of Effects Definitions for Grazing Management

Negligible: Effects to livestock grazing would be slight and no reductions to AUMs or change in livestock management would be required. There would be no change or loss of water availability that measurably affects livestock grazing or distribution.

Minor: Effects to livestock grazing may alter the availability of resources that livestock depends on (i.e., water availability; forage; behavior), and/or small reductions to AUMs may be necessitated. No adjustments to grazing management should be required beyond the small AUM reductions.

Moderate: Effects to livestock grazing directly affect livestock access to limiting resources (i.e., water availability; forage; behavior). Reductions to AUMs are necessary and adjustments to livestock grazing should be considered. Adverse effects would be minimized with implementation of applicant-committed EPMs, BMPs, but reclamation would require long-term monitoring and maintenance.

Major: Effects to livestock grazing affect management on a pasture or allotment level. Reductions in AUMs and a significant change in authorized use would be required. Adverse effects could be minimized with implementation of applicant-committed EPMs, and BMPs, but reclamation would require long-term monitoring and maintenance.

4.7.2 Direct and Indirect Impacts of the Proposed Action

Direct impacts to rangeland resources from the implementation of the Proposed Action would include a potential reduction in active AUMs due to a loss of forage availability and reduced access to some portions of the Project area due to fencing or high anthropogenic activity during times of operation. Another direct impact is the potential for livestock injury or mortality from vehicle collisions.

When BLM-administered land is withdrawn from multiple use and is authorized for a single public purpose (i.e., mining), AUMs are adjusted to reflect the AUMs with the area withdrawn. Temporarily reduced AUMs can be reinstated once reclamation has been successfully completed.

Implementation of the Proposed Action could result in the permanent loss of 10 AUMs and the temporary loss (i.e., until successful reclamation) of 69 AUMs, but any adjustment to permitted AUMs would be based on forage lost, removed, or otherwise inaccessible due to mining operation. Permitted active AUMs are 5,840 for the Three Bars Allotment and 9,624 for the Roberts Mountain Allotment, both divided between cattle and sheep. The effects of the Proposed

Action would be minor and result in a less than 0.01 percent loss of AUMs in either allotment. See **Table 4.7-1** for potential impacts to permitted grazing from the Proposed Action and allotment acres within the Plan boundary. **Figure 4.7-1** shows the impacted AUMs from the Project.

Table 4.7-1 Potential Impacts to Livestock Grazing from the Proposed Action

Allotment	Roberts Mountain		Three Bars
Pasture	**Rutabaga**	**West Roberts Seeding**	**Cottonwood**
Temporary Loss of AUMs	56	1	12
	57 (<0.01%)		12 (<0.01%)
	69 (0.01%)		
Permanent Loss of AUMs	8	0	2
	8 (<0.01%)		2 (<0.01%)
	10 (<0.01%)		

The Cottonwood and Rutabaga Pastures are not boundary fenced; however, drift fences are present in the northwest corner of the Plan boundary, along the boundary between the Cottonwood and Rutabaga Pastures. No livestock water developments are present within the Plan boundary. For security and the safety and protection of people and animals, fences would be constructed around the HLP, and the administration and process areas. The fenced areas would encompass 127 acres (consisting of the mining and processing facilities, the administration and process area, and at the generator and water storage area by GBPW-210), of which the majority (98 percent) has been mapped as pinyon-juniper woodland. Although the fences would be removed after mine closure, the reclaimed HLP would remain as a permanent feature. No other fences are being proposed within the Project area.

Atlas Haul Road, Three Bars Road, and Roberts Creek Road are considered existing disturbance and would not be improved beyond the existing road prism; therefore, these roads would have no additional direct impacts to AUMs. Three cattle guards were categorized as range improvements along the mine access roads, one on North Roberts Creek Road and two on Three Bars Road (**Figure 3.7-1**). Additionally, though not labeled as BLM range improvements, cattle guards are present within the existing mine access roadways where these roads cross pasture fence lines. North Roberts Creek Road would be intended for light vehicle traffic, including mine access and maintenance of the water supply pipeline; therefore, the existing cattle guards should be sufficient. However, MMI would replace any cattle guards that could not withstand the projected use or as needed during road maintenance or widening. Three Bars Road and Atlas Haul Road would be the main access road for delivery traffic. Cattle guards would be replaced as needed, to withstand the expected heavy-load traffic.

No fencing is proposed along any of the access roads and livestock would be free to access the Project area and surrounding property on either side of the roads. Direct impacts may result in mortality or injury due to vehicle-livestock collisions along Three Bars Road, Atlas Haul Road, North Roberts Creek Road, and Roberts Creek Road. The low speed limits proposed for these roads would reduce the risk of livestock-vehicle interactions. An indirect impact could be realized

if increased vehicle and mine traffic on these roadways influences livestock behavior, causing avoidance of the Project area.

Indirect impacts from the Proposed Action include economic impacts from the potential reduction in AUMs from the Proposed Action. The *Nevada Grazing Statistics Report and Economic Analysis for Federal Lands in Nevada* (RCI, 2001) valued total economic impacts (direct plus indirect or induced impacts) of one AUM at $53.40 (1997 dollars), which equates to $79.03 in 2016 dollars (U.S. Inflation Calculator, 2016). The remaining economic impacts would be presented in 2016 dollars ($1.00 in 1997 = $1.48 in 2016). The total economic impact from one AUM includes industry ($59.79) and value-added ($19.24) impacts. In total, $790.30 in economic impacts would be realized annually based on the permanent loss of 10 AUMs from the Proposed Action. Long-term loss of 69 AUMs (57 in the Roberts Mountain Allotment and 12 in the Three Bars Allotment) would equate to $43,625 over the life of the mine and majority of reclamation (estimated at six years after cessation of mining activities and residual heap leaching); assuming successful reclamation. AUM reductions may be realized beyond the seven-year mine life (i.e., five years of active mining and heap leaching plus two years of residual heap leaching), depending on the mechanisms determined for the duration of the rest of seeded areas from grazing.

This impact would be long-term, regional, and minor to the ranching community and agricultural or grazing sector of Nevada's or Eureka County's economy, but the economic impact to the affected permittees could be long-term, regional, and moderate. Less than one percent of AUMs within allotments and pastures affected by the Proposed Action would be lost temporarily or permanently. Successful reclamation would recover 86 percent of the AUMs lost temporarily during mine operation. Successful reclamation may also increase the forage quality and quantity because much of the disturbed area is currently pinyon-juniper woodland that would be reseeded with grasses, forbs, and shrubs. The Proposed Action would be in conformance with all relevant State and Federal laws pertaining to livestock grazing.

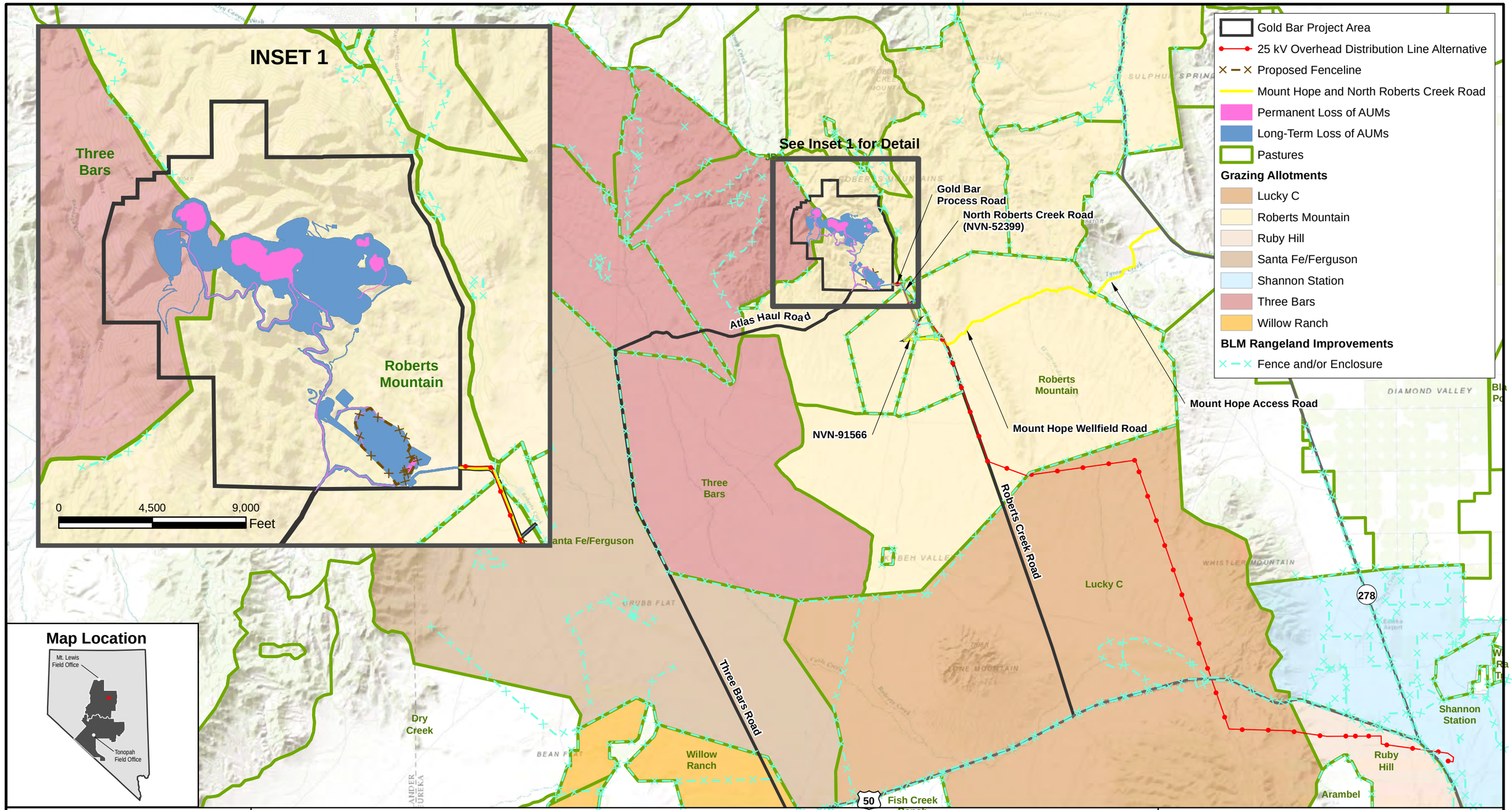
The parking lot in the town of Eureka is currently improved and on private land, so it would not affect grazing management.

4.7.2.1 Unavoidable Adverse Impacts

The Project would result in a loss of vegetation resources for use as forage for livestock grazing. Additionally, unsuccessful or poor reclamation outcomes could result in less forage availability than prior to the disturbance.

4.7.2.2 Irreversible and Irretrievable Commitments of Resources

The Proposed Action would result in the permanent loss of 10 AUMs due to the 154 acres of unreclaimed disturbance. However, 87 acres (56 percent) of the unreclaimed disturbance is considered existing disturbance.



Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 3 6 Miles
1 in = 3 miles

N

PROPOSED ACTION IMPACTS TO ANIMAL UNIT MONTHS

FIGURE 4.7-1

REVISION **A**

2/9/2017

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

4.7.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses impacted by the Proposed Action include reduced access to the Project area for livestock from the fenced area (127 acres) and possible avoidance due to increased vehicle and haul traffic and other mining-related anthropogenic activities. Many impacts to rangeland resources would be long term because successful revegetation of disturbed areas could take several years after the cessation of mining. Successful reclamation of the disturbed areas could result in more productive rangeland and higher quality forage available for livestock use.

4.7.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Direct impacts to rangeland resources from the implementation of this alternative in addition to those realized for the Proposed Action could include a negligible, temporary reduction of active AUMs due to a loss of forage availability until vegetation is re-established after reclamation. Adverse, temporary, negligible effects would be greater during the construction phase of the power line. Revegetation of the ROW would occur under this alternative, so grazing productivity would return over time. **Table 4.7-2** shows the potential impacts to permitted grazing, by allotment, from the implementation of this alternative in addition the impacts described for the Proposed Action.

Table 4.7-2 Potential Impacts to Livestock Grazing from the 25 kV Overhead Distribution Line

Allotment	Acres per AUM	Acres Disturbed	Miles of Disturbance	Potential Impacts to AUMs[1]
Lucky C	36	60	16	2
Roberts Mountain	16	44	9	3
Ruby Hill	11	20	4	2
Shannon Station	13	6	1	0.5
Total		**130**	**30**	**78**

[1] AUMs in this table are from the distribution line disturbance only. Impacts from this alternative include long-term and permanent loss of AUMs from the Proposed Action and the distribution line.

The potential for livestock injury or mortality from vehicle collisions would be negligible as the access road would only be used when conducting maintenance on the power line. Existing fences would remain in place, and where not currently present, gates would need to be placed where the maintenance access road crosses fence lines. No other range improvements are present within the ROW.

With negligible to no impacts to AUMs, there would be no additional economic effects as a result of implementing this alternative.

Overall, impacts to rangeland resources from the 25 kV overhead distribution line would be temporary (lasting until revegetation is established), regional, and negligible, with the potential additional loss of eight AUMs distributed among the four allotments during the life of the

distribution line. However, The distribution line would be fully reclaimed after closure of the Project, so these AUMs would return after the distribution line is reclaimed.

4.7.3.1 Unavoidable Adverse Impacts

This alternative could result in a negligible loss of vegetation resources for use as forage for livestock grazing until vegetation is re-established after reclamation; however, the loss would not result in a reduction of permitted AUMs.

4.7.3.2 Irreversible and Irretrievable Commitments of Resources

The distribution line would be fully reclaimed after closure of the Project, so no additional irreversible commitment of resources would occur to grazing management under this alternative.

4.7.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Grazing could be adversely impacted in the short-term as a result of this alternative including possible avoidance of nearby areas during the construction phase due to increased vehicle and anthropogenic activities. Most impacts to rangeland resources would be temporary and short-term with no effects to long-term productivity.

4.7.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. The potential for livestock-vehicle collisions may be increased along Three Bars Road, since the light-duty vehicle traffic would also be using this access road. Overall, impacts to grazing management from this alternative would be long-term, regional, and negligible, the same as those described for the Proposed Action.

4.7.4.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.7.4.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources to those described for the Proposed Action are anticipated for this alternative.

4.7.4.3 Relationship of Short-Term Uses and Long-Term Productivity

No additional impacts to short-term use or long-term productivity of rangeland resources to those described for the Proposed Action are anticipated for this alternative.

4.7.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. No improvements to Mount Hope mine access or well field roads are proposed for this alternative beyond what was previously authorized with the Mount Hope Project. Impacts from Mount Hope roads were analyzed in the 2012 Mount Hope Project FEIS (BLM, 2012a). Potential impacts from vehicle-livestock collisions may be reduced because the Mount Hope Plan boundary would be fenced, excluding livestock. Overall, impacts to rangeland resources from this alternative would be long-term, regional, and negligible, the same as those described for the Proposed Action.

4.7.5.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.7.5.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources to those described for the Proposed Action are anticipated for this alternative.

4.7.5.3 Relationship of Short-Term Uses and Long-Term Productivity

No additional impacts to short-term use or long-term productivity of rangeland resources to those described for the Proposed Action are anticipated for this alternative.

4.7.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. There would be no changes to permitted grazing or range improvements as the Proposed Action would not be implemented.

Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. The existing conditions would include approximately 654 acres of existing disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, reclamation would not occur on portions of this existing disturbance. Impacts to grazing management as a result of this alternative are expected to be localized, negligible, and short-term.

4.8 Hazardous or Solid Waste

4.8.1 Indicators

The following indicators were considered when analyzing potential impacts to resources from hazardous materials and solid waste:

- Tons or pounds per year of hazardous wastes, and by-products;
- Amount and type of hazardous materials transported and stored at the Project site;
- Location and type of solid or hazardous waste disposal sites/systems; and
- Existing risk assessments of effects of hazardous compounds.

Effects Context for Hazardous or Solid Waste

Localized: Generation or transportation of waste (solid or hazardous) would only occur during distinct activities at a specific location located on the Project site.

Regional: Generation of or transportation of waste (solid or hazardous) would require the use of or have an effect on regional resources.

Duration of Effects Definitions for Hazardous or Solid Waste

Short-term: Generation or transportation of waste (solid or hazardous) that occurs during the life of the Project.

Long-term: Generation or transportation of waste (solid or hazardous) would occur beyond the life of the Project.

Intensity of Effects Definitions for Hazardous or Solid Waste

Negligible: No harmful or hazardous waste would be generated by activities associated with the project. A relatively small amount of solid, non-hazardous waste (i.e., garbage, human waste) would be generated, and petroleum products would be used. Applicant-committed EPMs and BMPs would minimize the potential for adverse effects on humans or natural resources.

Minor: Harmful or hazardous waste would be generated during project activities, in addition to generation of solid, non-hazardous waste, and use of petroleum products. Applicant-committed EPMs and BMPs would minimize the potential for adverse effects on humans or natural resources.

Moderate: Harmful or hazardous waste would be generated during project activities, in addition to generation of solid, non-hazardous waste, and petroleum products. Applicant-committed EPMs and BMPs would minimize the potential for adverse effects on humans or natural resources, but the exposure risk or quantities used/generated would increase the potential for harmful effects.

Major: Harmful or hazardous waste would be generated during project activities. Applicant-committed EPMs and BPMs would minimize the potential for adverse effects on humans or natural resources, but the risk for adverse effects would be high.

4.8.2 Direct and Indirect Impacts of the Proposed Action

The Proposed Action would result in the use of hazardous materials and waste management practices for mine production, with the potential to affect the air, water, soil, and biological resources from an accidental release of hazardous materials and/or solid and hazardous waste

during transportation to and from the Project area, or during storage and use on the Project site. The majority of waste generated during mining and beneficiation is “mine waste,” including spent ore and waste rock, which is currently excluded from regulation as hazardous waste under RCRA through the Bevill Amendment (NDEP, 2015b).

Access to the Project site would be from U.S. Highway 50 north along one of the two potential access roads: Heavy vehicle traffic would access the mine site by using Three Bars Road for approximately 16 miles, then east for 1.5 miles on Gold Bar Road to the former Atlas Mill area, then the existing Atlas Haul Road for approximately seven miles to the proposed mine facilities. Light vehicle traffic access to the mine facilities would be from U.S. Highway 50 and traveling north on the existing Roberts Creek Road for approximately 13 miles, then west on the NVN-091566 for approximately one mile to North Roberts Creek Road (NVN-052399) to the mine site. The Proposed Action is located approximately 30 miles northwest of Eureka, Nevada (**Figure 1.1-1**). Bulk process chemicals, fuels, and supplies would be transported to the Project area by truck along the highways in the region, using the routes identified in Section 3.8.1.1 (**Figure 3.8-1**). Trucks are considered heavy vehicles, and would, therefore, not utilize Roberts Creek Road access, as it is limited to light vehicle traffic only. Transporters would comply with all applicable federal, state, and local regulations governing the transportation of hazardous materials and waste. **Table 2.2-8** lists the primary fuels and reagents that would be transported to and utilized on the mine. The storage locations are discussed further in Operations and Maintenance and shown on **Figure 2.2-1**.

It is anticipated that the Proposed Action would result in the classification of the facility as a Small Quantity Generator of hazardous waste as defined by the EPA (between 220 pounds, or 100 kilograms, and 2,205 pounds, or 1,000 kilograms, per month). Management of hazardous waste, including transportation, storage, disposal, and reporting, would be in accordance with RCRA requirements. Petroleum waste and hazardous waste that are not spent or consumed on site would be recycled or disposed off-site at an approved facility in accordance with applicable federal, state, and local regulations. A SCP has been prepared by MMI that establishes procedures for responding to accidental spills and releases of petroleum products (MMI, 2013).

Operations and Maintenance

Operation and maintenance of the Proposed Action would result in the generation of nonhazardous and hazardous materials. Non-hazardous solid waste would be managed on-site in a permitted Class III landfill, a disposal site that accepts only industrial solid waste per NRS 444.560 that complies with NAC 444.731 through 444.747 (NAC, 2015). This facility would be located within the Pick East Upper Dump (**Figure 2.2-1**).

Lab sinks would be designated either as an “acid” sink or a “base” sink. These sinks would drain to tanks within secondary containment capable of holding 110 percent of the volume of the largest tank in the area. The tank contents would be neutralized on a regular basis. The neutralized waste would be disposed of in accordance with applicable regulatory requirements. Nonhazardous solid wastes from the laboratory would be disposed of in the on-site Class III landfill. Other wastes from

the laboratory that exhibit a hazardous characteristic would be managed as hazardous waste and disposed off-site.

Small quantities of hazardous waste would be temporarily stored per federal, state, and local regulations. Most of the hazardous materials used on site would be spent or consumed during operations. Materials that were not spent or consumed, such as used antifreeze and oil, would be recycled or disposed off-site in accordance with applicable federal, state, and local regulations.

Employee training would include appropriate disposal practices such as the allowable wastes that can be disposed of in the on-site landfill, management of used filters, oily rags, fluorescent light bulbs, aerosol cans, and other regulated substances. Used solvent, liquids drained from aerosol cans, accumulations of mercury fluorescent lights and used antifreeze would be managed pursuant to RCRA.

Sanitary liquid wastes would be handled and disposed of through septic tanks/leach fields permitted by the NDEP. Used oil and lubricants would be collected and transported off site by a buyer/contractor for recycling. Reagent drums would be recycled by the supplier. Scrap metal would be sold to a dealer and transported off site. These management practices would, therefore, produce both regional and localized, short-term, negligible environmental impacts on site.

Reagents would be delivered to the mine site for off-loading, storing, mixing, and handling. Reagents would be pumped to storage tanks from which they would be metered into the process solution stream. Potential reagent spills would be contained by secondary containment systems capable of holding 110 percent of the volume of the largest tank in the area in the reagent mixing and storage areas. The ADR building would have a sealed concrete foundation with curbing to contain spills. A floor sump pump would be used to return any spilled material either to the storage tank or into the leach circuit, as appropriate. SDS for the reagents would be readily available, in accordance with MSHA's Hazard Communication for the Mining Industry (MSHA, 2016). Bulk reagents would be stored in tanks outside of the process facilities in a secondary containment area capable of holding 110 percent of the volume of the largest tank in the area. Smaller quantity reagents used in the analytical and metallurgical test procedures would be stored inside the laboratory in secondary containment capable of holding 110 percent of the volume of the largest tank in the area.

Explosive agents would be transported, stored, and used in accordance with the Bureau of Alcohol, Tobacco, and Firearms; the Department of Homeland Security provisions; MSHA regulations; and other applicable federal, state, or local legal requirements. Explosive agents, boosters, and blasting caps would be stored within a secured explosives storage area located adjacent to the main haul road, away from the mine surface facilities.

All petroleum products and reagents used in the process would be stored in above ground tanks within a secondary containment area capable of holding 110 percent of the volume of the largest tank in the area. A SCP, as required by 43 CFR § 3809.401(b)(2)(vi) (BLM, 2011d), would be reviewed and updated regularly and whenever major changes were made in the management of

these materials. Inspection and maintenance schedules and procedures are set forth in sections of the SCP.

Fuel and oil for diesel and gas powered equipment would be stored in above ground, sealed tanks in the processing facilities area. The tanks would be installed on lined pads, consisting of gravel underlain by a plastic liner. The storage area would be surrounded by berms to provide secondary containment capable of holding 110 percent of the volume of the largest vessel in the event of a rupture. Surface piping would lead from each tank to the fuel dispensing area. The refueling hoses would be equipped with overflow prevention devices, and refueling would occur within a secondary containment area capable of holding 110 percent of the volume of the largest tank in the area.

Petroleum-contaminated soils (PCS) generated from hydrocarbon spills or leaks in the Project area would be removed from the spill site and placed in a dumpster for disposal in accordance with NDEP guidelines for PCS (NDEP, 2009).

Use of the parking lot in the town of Eureka would have short-term, localized, negligible impacts on hazardous or solid waste generation or transportation. Vehicles parking at the lot may increase the potential for petroleum related spills or leaks from the vehicles at the lot. However, this is anticipated to be a short-term and negligible impact.

Probability of a Release

Process chemicals, fuel, and/or waste materials could be accidentally released during transport to and from the Proposed Action area. The Proposed Action would require transport of the chemicals to the site and waste from the site in quantities described in **Table 2.2-8**.

The probability of a truck accident involving hazardous materials was analyzed using national accident statistics for truck shipments of hazardous materials (FMCSA, 2001). The primary emphasis in this analysis has been placed upon the release of liquid material that could pose an immediate human health hazard or an off-site contaminant hazard. Most of the major reagents would be shipped dry and mixed at the mine site, except for diesel fuel and hydrochloric acid. The estimated deliveries of diesel fuel and hydrochloric acid have, therefore, been included in this analysis, as these chemicals are the largest quantities that would be used in liquid form. Other chemicals are in smaller quantities of liquid, or are solids.

The probability of a truck accident that would result in the release of the selected hazardous materials was calculated using the national rate of releases per mile traveled. Three main travel route distances were assumed for this analysis: 385 miles for the Reno I-80 route, 245 miles for the Reno U.S. 50 route, and 140 miles for the Elko route. The estimated number of life-of-mine truck deliveries for the selected materials are as follows: diesel fuel – 805, and hydrochloric acid - 40. The release probability was calculated over a mine life of seven years (i.e., five years of active mining and heap leaching plus two years of residual heap leaching). **Table 4.8-1** shows the release probability information calculated for all travel routes. A majority of the chemicals

would potentially be transported from Elko, based on the railroad hubs located in Elko, as well as the numerous active mines in the Elko area.

The analysis shows that the probability of a release for each substance would be as follows: diesel fuel – probability of 153.7 per 1,000 miles for the Reno I-80 route, 97.8 per 1,000 for the Reno U.S. 50 route, and 55.9 per 1,000 for the Elko route; hydrochloric acid – 2 per 1,000 miles for the Reno I-80 route, 1.3 per 1,000 for the Reno U.S. 50 route, and 0.7 per 1,000 for the Elko route. These results indicate a high probability of an accidental release of diesel fuel, and a low probability of an accidental release of hydrochloric acid to the environment during the estimated life of the Proposed Action. National accident statistics for flammable and combustible materials (diesel fuel) indicate a higher incident of release per mile of travel than the other categories used in this analysis. The probability of a release to the environment in a populated area is estimated to be approximately 13 times less for the Reno I-80 Route, about 10 times less for the Reno U.S. 50 route, and 18 times less for the Elko route than the estimates shown in **Table 4.8-2**, because approximately 30 miles of the Reno I-80 route is located within developed area, 25 miles of the Reno U.S. 50 route, and 8 miles of the Elko route. Based upon the small quantities of hazardous waste that would be generated by the Proposed Action, an accident resulting in a release of hazardous waste to the environment during transportation off the Proposed Action area is not anticipated.

Table 4.8-1 Hazardous Material National Accident Rate per Mile

Hazardous Material Category	Hazmat Miles	Total Hazmat Accidents	Hazmat Accident Rate Accident/Mile
3 – Flammable & Combustible	2,800,000,000	1,379.02	4.96E-07
8 – Corrosive	1,900,000,000	257.00	1.32E-07

Source: FMCSA, 2001

Table 4.8-2 Hazardous Material Probability of Transportation Release

Hazardous Material	Number of LOM Truck Deliveries	Loaded Truck Haul Distance per Trip	Accidents Per Mile[1]	Release Probability
Diesel (3)	805	Reno I-80 - 385	4.96E-07	0.1537
		Reno U.S. 50 - 245		0.0978
		Elko - 140		0.0559
Hydrochloric Acid (8)	40	Reno I-80 - 385	1.32E-07	0.0020
		Reno U.S. 50 - 245		0.0013
		Elko - 140		0.0007

[1] The rate is based upon the hazardous material category of the chemical shown in **Table 4.8-1**.

Perennial water sources along the proposed transportation routes are displayed on **Figure 3.8-1**. These water sources are either parallel or directly cross the potential transportation routes. A release into these areas is possible due to the percentage of the routes paralleling or crossing waterways, but unlikely.

Effects of a Release

The environmental effects of a release would depend on the substance, quantity, timing, and location of the release. The potential for off-site releases during transportation is calculated for hazardous substances only and does not indicate a volume or location. The event could range between a minor oil spill on the Project site where cleanup equipment would be readily available to a large fuel or chemical spill during transportation. Some of the chemicals could have immediate adverse effects on water quality and aquatic resources if a spill were to enter a flowing stream or wetland area. Alternatively, a spill onto dry land would have minimal impacts. Considering the transport routes, the probability of a spill of these materials impacting a wetland or other waterway is possible, but unlikely.

Hydrochloric acid spills which occur on the ground or in water would have the potential to impact local population of aquatic and terrestrial life through the oxidizing action which destroys plant and animal cells. An acid spill into a waterway would have the potential to migrate downstream from the initial spill site. Generally alkaline conditions of soils and water in the region would be anticipated to rapidly neutralize any acid spill. Transporters of hazardous materials are required to immediately report any significant spills. Rapid response to any spills and subsequent cleanup actions would reduce long-term damage to the environment.

A release of diesel fuel to the ground would have the potential to impact vegetation with a small risk of igniting, causing a range fire. A spill into a waterway would cause contamination of water and soil, likely affecting local aquatic populations. With rapid response and cleanup actions, diesel contamination would not result in a long-term increase in hydrocarbons in soils, surface water, or groundwater.

Public Safety

Any large-scale release of hazardous substances would have implications for public health and safety. The location of the release would again be a primary factor in determining its importance. The probability of a release is low and the probability of a release in a populated area or waterway is lower. Therefore, it is not anticipated that a release involving a severe effect to human health or safety would occur during the life of the Project.

In the event of a release during transport, the commercial transportation company would be responsible for emergency response and cleanup. Local and regional law enforcement and fire protection agencies also may be involved to secure the site and protect public safety. In the event of an accident involving hazardous substances, the carrier must notify local emergency response personnel. The release of a reportable quantity of a hazardous substance must be reported to the appropriate state and federal agencies within the specified time frames. Impacts from hazardous and solid waste from the Project are not expected to be long-term and would be regional and minor.

4.8.2.1 Unavoidable Adverse Impacts

Waste produced by the Proposed Action would be managed in conformance with applicable federal, state, and local regulations in permitted waste management facilities to minimize

environmental impacts. These wastes would contribute to the environmental impacts allowed by the waste management facility permits. Unavoidable adverse impacts would also include the potential effects of the release of a hazardous material.

4.8.2.2 Irreversible and Irretrievable Commitments of Resources

Wastes produced during construction and operation of the Proposed Action that would be disposed of off-site in existing permitted facilities would irreversibly consume some of the waste storage capacity at those facilities.

4.8.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The use of hazardous materials and generation of solid and hazardous wastes during the construction and operation of the Proposed Action (short-term) would consume some disposal capacity, causing a long-term impact in the productivity of off-site waste management facilities.

4.8.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

The types of wastes managed and the applicable management practices applied for this alternative would be the same as for the Proposed Action. The environmental impacts of these practices for this alternative would, therefore, be the same as the Proposed Action.

4.8.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts due to hazardous materials would be the same as described for the Proposed Action.

4.8.3.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action.

4.8.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.8.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. The types of wastes managed and the applicable management practices applied for this alternative would be the same as for the Proposed Action. The environmental impacts of these practices for this alternative would, therefore, be the same as the Proposed Action.

4.8.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts due to hazardous materials would be the same as described for the Proposed Action.

4.8.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action.

4.8.4.3 Relationship of Short-Term Uses and Long-Term Productivity

Relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.8.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. The types of wastes managed and the applicable management practices applied for this alternative would be the same as for the Proposed Action. The environmental impacts of these practices for this alternative would, therefore, be the same as the Proposed Action.

4.8.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts due to hazardous materials would be the same as described for the Proposed Action.

4.8.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action.

4.8.5.3 Relationship of Short-Term Uses and Long-Term Productivity

Relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.8.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. Notice-level activities would result in the use of hazardous materials, and have the potential for an accidental release of hazardous materials during transportation to and from the Project area, or during storage and use on the Project site. Hazardous materials used on site would be spent or consumed during Notice-level operations. Materials that were not spent or consumed, such as used antifreeze and oil, would be recycled or disposed in accordance with

applicable federal, state, and local regulations. Impacts from hazardous or solid waste are expected to be short-term, regional, and negligible under this alternative.

4.9 Historic Trails

4.9.1 Indicators

The following indicators were considered when analyzing the potential direct and indirect effects that each alternative would have on the National Trails System:

- Change in the accessibility to the National Trail study corridor;
- Degree of contrast or conflicts with established BLM VRM class objectives for the National Trail study corridor;
- Change in the scenic quality of the existing landscape visible within and from the National Trail study corridor that conflict with the intended purpose(s) or use(s), or the setting of the Pony Express NHT; and
- Change in ambient noise level measuring more than five dB.

The assessment of potential impacts on the visual setting of the National Trail study corridor resulting from the Proposed Action and the other alternatives was completed using the BLM Visual Contrast Rating System. Under the BLM Visual Contrast Rating System, the extent of an alternative's impact is dependent on the degree of visual contrast the Project would have with the existing landscape features in terms of form, line, color, and texture. A detailed description of the BLM Visual Contrast Rating System is provided in BLM Manual H-8431, *Visual Resource Contrast Rating* (BLM, 1986b).

A comparison of the Project features that would be visible under each alternative and the existing landscape features was performed for the National Trail study corridor. Specifically, the form, line, color, and texture elements that characterize the components of Project (e.g., HLP, WRDA, etc.) were identified and compared with the form, line, color, and texture elements of the existing landscape features. The amount of difference among the form, line, color, and texture elements of the Project and the existing visual setting determines the degree of contrast an alternative would be expected to have. The results of this comparison and expected degree of contrast were applied to the effect indicators listed above to determine the potential for each alternative to impact visual resources, and thus the visual setting of National Trail study corridor. If an alternative was found to be incompatible with the designated VRM class objectives, the impact was considered either major or moderate, depending on the level of conflict with the objectives. Compatibility with the objectives of the designated BLM VRM Class was considered either a minor or negligible impact, depending on whether the visual intrusion of the Project approached the acceptable limits of visual alterations assigned to the VRM Class.

Although the VRM Class designation of the BLM-administered public lands within the National Trail study corridor located within the area of analysis is currently Class IV, BLM Manual 6280 states that VRM Class IV should not be considered for use within a National Trail Management Corridor. Thus, Project activities located within an anticipated future National Trail Management Corridor for the Pony Express NHT were also assessed for compliance with the visual objectives of BLM VRM Class III. The objective of VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape (BLM, 1986b).

A five-decibel change in the ambient noise level was used as an indicator because an increase of five decibels is generally required before the human ear detects a meaningful change. Changes in noise levels were evaluated for their effects on the setting of the Pony Express NHT. Noise levels associated with the Project were predicted using the CadnaA Noise Prediction Model (Brennan, 2016). The CadnaA Noise Prediction Model predict overall noise levels for multiple noise sources, while also accounting for topography, air temperature, humidity, wind speed, and wind direction. Noise level data collected in the field for equipment, operations, and haul trucks like those proposed to be used for the Project were input into the model. Noise level data for the following equipment and operations were used in the modeling:

- Pit operations;
- Waste rock storage;
- Heap leaching operations;
- Haul roads;
- Crushing operations;
- Overland conveyor;
- Processing plant; and
- Access roads.

Effects Context for Historic Trails

Localized: Effects would occur at a small scale, such as along a small section of a NHT.

Regional: Effects would occur along a large portion of a NHT, and the region surrounding the NHT.

Duration of Effects Definitions for Historic Trails

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Intensity of Effects Definitions for Historic Trails

Negligible: Effects to historic trails would not affect the cultural, visual, and recreational integrity and character of the NHT, or the effects would be small, not perceptible, and not measurable.

Minor: Effects to historic trails would be detectable, measurable, and perceptible but small, localized, and of little consequence. Applicant-committed EPMs and BMPs would minimize the potential for adverse effects on the cultural, visual, and recreational integrity and character of the NHT.

Moderate: Effects to historic trails would be readily apparent, measurable, large and of consequence, but localized. Effects would affect the cultural, visual, and recreational integrity and character of the NHT. Applicant-committed EPMs and BMPs would minimize the potential for adverse effects on the cultural, visual, and recreational integrity of the NHT, but additional mitigation measures may be required, but mitigation would likely be successful.

Major: Effects to historic trails would substantially change the cultural, visual, and recreational integrity and character of the NHT. These changes may have permanent consequences for the resource. Mitigation may be necessary to reduce or rectify adverse effects, and these measures would need to be monitored to determine their effectiveness.

4.9.2 Direct and Indirect Impacts of the Proposed Action

The Pony Express NHT does not cross the main mining Project area, but the two existing access roads which are part of the Plan boundary do cross the Pony Express NHT. Public and recreational access to the trail would not be affected by mining and processing facilities. However, there would be increased mine traffic (Section 4.10).

While mining and processing facilities would be located outside of the National Trail study corridor, many of the facilities and much of the surface disturbance would be visible from within the corridor. Construction of mining and processing facilities would require surface disturbance that removes existing vegetation cover from within the Project area. Removal of vegetation cover would introduce form, line, color, and texture elements that contrast with the existing landscape. Construction would also require mass-grading or reshaping of soils and landforms for the construction of roads, pits, WRDAs, HLP, and other project facilities described in Chapter 2. The removal of vegetation cover and mass movement of soils and landforms would contrast with the surrounding landscape.

Based on the viewshed analysis prepared for the Project (**Figures 3.9-1** through **3.9-4**), existing mining disturbance is currently visible from the Pony Express NHT. The Proposed Action would contribute additional disturbance to what is already seen. Trail users may or may not notice the increase in disturbed area as it would be several miles away (**Figures 3.9-1** through **3.9-4**). Approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action. Reclamation of these areas under the Proposed Action would reduce existing visual impacts to the Pony Express NHT.

Therefore, effects on the visual setting of the National Trail study corridor would be short-term, localized, and negligible to minor.

While many components of the Project would be visible from within the National Trail study corridor and constitute a change in scenic quality, the change would be minor to moderate because the existing visual setting contains similar modifications, including existing mine disturbance, unpaved roads, and ranching facilities. Additionally, most components of mining and processing facilities would be located more than approximately three miles away from the Pony Express NHT.

According to the noise study, the ambient noise levels within the National Trail study corridor would increase by as much as eight dBA from operation of the Project (Brennan, 2016). The major contributor of Project-related noise would be from generators (Brennan, 2016). An increase of eight dBA in ambient noise levels would be noticeable, especially generator noise, which is not present in the existing ambient noise in the National Trail study corridor. Impacts to the setting of the Pony Express NHT from noise impacts would be short-term, localized, and moderate.

The use and improvement of Roberts Creek Road would cross the Pony Express NHT and associated study corridor. MMI use of the road would not preclude public use of the road. The public could travel on the existing road and reach the Pony Express NHT. However, the public would encounter increased traffic volumes associated with MMI vehicles using the road for access to the mine (Section 4.10). The increased traffic would occur during shift changes and may cause slight delays to the general public wishing to access the trail at those times. Impacts relating to a change in the accessibility of the trail and the level of traffic on adjacent roads would be short-term, localized, and negligible.

Widening and improving North Roberts Creek Road would change the appearance of the road within the National Trail study corridor. The existing bold, flat form of the road surface would increase in size because it would become wider. However, the visual contrast would be negligible because the widened road would appear very similar to the existing road at its current width. Widening and improving North Roberts Creek Road would have only negligible changes to the scenic quality of National Trail Study Corridor. Impacts to the intended purposes or uses, or the setting of the Pony Express NHT would be long-term, localized, and negligible. Further, this segment of the Pony Express NHT is designated as Condition Category IV (Location Verified and Permanently Altered); the Proposed Action would not change the Condition Category or change how the trail segment is currently managed.

As stated above, increased traffic would be expected on Roberts Creek Road. The increased traffic volume may affect the intended setting of the trail. Transportation when the Pony Express Trail was operational would have consisted of horses and horse-drawn carriages and carts. Motor vehicles were not part of the transportation system during the period of the Pony Express Trail. Increased traffic during shift changes could impact the user's experience by altering the feeling of a remote setting. Although the increased vehicle use on the road would not be consistent with the traditional and intended setting of the trail, impacts would be short-term, localized, and minor because the trail crosses numerous roads with vehicle travel, and because there are already vehicles travelling on Roberts Creek Road.

The 2016 noise study (J.C. Brennan & Associates, Inc.) determined that the Project would not increase ambient noise levels at the location where Roberts Creek Road would cross the National Trail study corridor. Accordingly, Project-related noise associated with use of Roberts Creek Road would not be expected to have any additional impacts to the traditional and intended setting of the Pony Express Trail.

4.9.2.1 Unavoidable Adverse Impacts

During construction and operation of the Project, unavoidable adverse impacts to the intended setting of the Pony Express NHT would include visual impacts from Project construction equipment, vehicle traffic, and personnel. However, these impacts would be a continuation of current conditions. The degree of visual contrast and impacts to the Pony Express NHT's setting associated with the Project would be reduced following reclamation, but would not be eliminated entirely.

4.9.2.2 Irreversible and Irretrievable Commitments of Resources

The disturbance added to the landscape by the proposed mining pit would be an irreversible and irretrievable commitment of visual setting because the mine pit would not be reclaimed. Reclamation of some Project components, such as the WRDA and the HLP would lessen the disturbance in the landscape, but not eliminate all contrast entirely. The visual disturbance created by these Project components would be visible from the National Trail study corridor.

4.9.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The short-term use of the analysis area for the Project would impact the long-term productivity of the National Trails System. The mine pits would remain visible for an indefinite amount of time after the Project. Although other components of the Project, such as the WRDA and HLP would be reclaimed, they would also remain visible for an indefinite amount of time after the Project. The loss of productivity would be negligible because the visual impact would be minor and have only short-term, localized, negligible effects on the intended setting of the Pony Express NHT.

4.9.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

The visual contrasts associated with mining and processing facilities would be the same as described for the Proposed Action in Section 4.9.2. Also, the impacts associated with the Roberts Creek Road and Three Bars Road described in Section 4.9.2 would occur under this alternative.

Under this alternative, a separate ROW would be granted to Mt. Wheeler to construct and operate a proposed overhead distribution line. The proposed distribution line would cross the Pony Express NHT and associated study corridor. The ROW for the distribution line would not restrict or alter existing public access to the trail. However, the overheard distribution line would have visual impacts on the setting of the trail. The distribution line would be constructed of wood poles that would blend in with the surrounding landscape as it becomes further distant, therefore it would not dominate the view of the casual observer. Impacts to the intended purposes, uses, and setting of the Pony Express NHT would be short-term, localized, and minor.

Noise impacts predicted to result from use of generators, as described in Section 4.9.2 would not occur under this alternative. This alternative would not have noticeable increases to ambient noise levels within the National Trail study corridor.

4.9.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts of this alternative would be the same as described for the Proposed Action. Additionally, the 25 kV overhead distribution line would create additional visual impacts to the intended setting of the Pony Express NHT. Visibility of the distribution line would be unavoidable.

4.9.3.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable impacts of this alternative from mining would be the same as described for the Proposed Action. However, the distribution line would be fully reclaimed after closure of the Project.

4.9.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The short-term use of the analysis area for the Project would impact the long-term productivity of the National Trails System. These impacts would be the same as the Proposed Action.

4.9.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. The visual and noise impacts associated with mining and processing would be the same as described for the Proposed Action in Section 4.9.2. The visual, noise, and traffic impacts described under the Proposed Action associated with the use of Roberts Creek Road would not occur under this alternative.

4.9.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts of this alternative would be the same as described for the Proposed Action in Section 4.9.2.

4.9.4.2 Irreversible and Irretrievable Commitments of Resources

Implementation of this alternative would have the same irreversible and irretrievable commitment of resources as the Proposed Action.

4.9.4.3 Relationship of Short-Term Uses and Long-Term Productivity

Implementation of this alternative would have the same relationship of short-term use and long-term productivity of the National Trails System as the Proposed Action.

4.9.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. The visual and noise impacts associated with mining and processing would be the same as described for the Proposed Action in Section 4.9.2. Also, the impacts associated with the use of Roberts Creek Road described in Section 4.9.2 would not occur under this alternative.

The authorized Mount Hope mine access road and well field road cross the Pony Express NHT. While all improvements to the Mount Hope access road would be within the previously permitted disturbance area for the Mount Hope Project, the number of vehicle trips on the roads would increase with the additional traffic to the Project. The additional traffic would increase ambient noise levels and could impact the user's experience by altering the feeling of a remote setting. Impacts to the intended purposes, uses, and setting of the Pony Express NHT would be localized, short-term, and minor. The additional light vehicle traffic associated with the Project would not be different from existing ambient noise conditions near the Pony Express NHT.

4.9.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts of this alternative would be the same as described for the Proposed Action in Section 4.9.2.

4.9.5.2 Irreversible and Irretrievable Commitments of Resources

Implementation of this alternative would have the same irreversible and irretrievable commitment of resources as the Proposed Action.

4.9.5.3 Relationship of Short-Term Uses and Long-Term Productivity

Implementation of this alternative would have the same relationship of short-term use and long-term productivity of the National Trails System as the Proposed Action.

4.9.6 Direct and Indirect Impacts of the No Action Alternative

Under the this alternative, the Project would not occur. There would be no changes to vehicle traffic on Roberts Creek Road under this alternative. There would be no new impacts to the ambient noise levels within the National Trail study corridor from the continuation of these activities. Also, under this alternative, the Project would not be constructed, so the additional visual impacts associated with construction and operation of the Project would not occur. However, up to 16 acres of authorized surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14 which may currently be impacting the visual setting of the area of analysis. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Under this alternative, reclamation would not occur on portions of this existing disturbance. Impacts to the

Pony Express NHT under this alternative would be short-term and minor, lasting for the duration of exploration activities within the area of analysis. The existing disturbance within the Project area would continue to be a long-term, localized, minor impact on the visual setting of the Pony Express NHT.

4.10 Land Use, Access, Realty, and Transportation

4.10.1 Indicators

Impacts on lands, access, realty, and transportation caused by Project construction or operation were evaluated by determining the potential for:

- Conflicts with existing federal, state, and local land use plans, goals, and policies;
- Conflicts, substantial modifications, or termination of existing land uses or land use authorizations;
- Restricted access to existing land uses or land use authorizations;
- Disruption of the physical arrangement of established communities; and
- Increased traffic on surrounding roads.

Effects Context for Land Use, Access, Realty, and Transportation

Localized: Effects on lands use, realty actions, access, and traffic generation would be limited to the area of analysis (i.e., Project area), or to one community.

Regional: Effects on land use, realty actions, access, and traffic generation would extend to multiple communities.

Duration of Effects Definitions for Land Use, Access, Realty, and Transportation

Temporary: Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Permanent: Effects to land use, access, and realty and\or traffic generation would be permanent.

Intensity of Effects Definitions for Land Use, Access, Realty, and Transportation

Negligible: Effects to land use, access, realty actions, and existing established communities would either not occur, or effects would be so slight as to not be measurable or perceptible. No access restrictions to existing land use authorizations would occur. The Project would not result in any inconsistencies with existing land use plans, goals, and policies, or any inconsistencies could be

resolved without modifications to land use plans. There would not be a measurable or perceptible impact from traffic generation on current traffic conditions.

Minor: Effects to land use, access, realty actions, and existing established communities would be measurable and perceptible, but would be small and would not affect the validity of existing land use authorizations, nor the ability to implement future realty or land use authorizations. Access to existing land use authorizations would be maintained. The Project would not result in any inconsistencies with existing land use plans, goals, and policies, or any inconsistencies could be resolved without modifications to land use plans. There would be a measurable or perceptible impact to traffic generation on current traffic conditions; however, AADT increase on roadways would be small, and would not impact the integrity of the transportation system or traffic conditions. Applicant-committed EPMs would effectively minimize impacts to land use, access, realty, and transportation.

Moderate: Effects to land use, access, realty actions, and existing established communities would be readily apparent and measurable, and they may affect the validity of existing land use authorizations, and the ability to implement future realty or land use authorizations. The Project would conflict with land use plans, goals, and policies, and may require modifications to these plans for conformance. There would be a readily apparent, measurable traffic increase on the surrounding transportation system, and the AADT increase on roadways would be relatively high. Additional mitigation measures beyond applicant-committed EPMs may be required to minimize impacts to land use, access, realty, and transportation, but these measures would likely be successful.

Major: There would be significant conflicts with to existing land uses, realty actions, and existing established communities, as well as the ability to implement future realty or land use authorizations. The Project would result in significant conflicts with land use plans, goals, and polices and modifications to these land use plans would be required. Traffic increase on roadways would be significant, and there would be a substantial increase in AADT on roadways. Mitigation measures beyond applicant-committed EPMs may be required to minimize impacts to lands use, access, realty, and transportation, and these measures would have to be monitored to determine their effectiveness.

4.10.2 Direct and Indirect Impacts of the Proposed Action

The Proposed Action is not in conflict with the goals and policies described in the Shoshone-Eureka RMP and the FLPMA. The Proposed Action would be considered reasonably incident under the BLM's occupancy regulations at 43 CFR 3715. Additional plans and regulations that guide development in Eureka County include the Eureka County Master Plan and Titles 8 and 9 of the Eureka County Code. Specific goals and policies of the Eureka County Master Plan are provided in **Appendix B**.

Lands and Realty

Mining and processing facilities associated with the Proposed Action would result in the disturbance of approximately 1,129 acres, which does not include existing non-MMI disturbance to be reclaimed. Approximately 946 acres of the disturbance (including exploration activities) would occur on BLM administered public land and approximately 183 acres of disturbance would occur on private land. Project related disturbance from mining and processing facilities would result in the short-term, minor, direct loss of approximately 946 acres (not including non-MMI disturbance to be reclaimed) of public land for multiple use authorizations for the seven-year life of the mine (i.e., five years of active mining and heap leaching plus two years of residual leaching). Approximately 127 acres of mining and processing facilities would be fenced at the administration and process area and at the generator and water storage area by GBPW-210. This fenced area would result in short-term, minor, direct effects to land use by prohibiting access and use of these locations during the life of the mine for other land uses such as livestock grazing and recreation. However, there is adequate public land adjacent to the Project boundary for multiple use authorizations during the life of the Project, so impacts to multiple land use authorizations from the loss of approximately 946 acres of public land from mining and processing facilities would be short-term, localized, and minor.

Disturbance associated with mining and processing facilities on public land would result in the direct loss of livestock grazing area. Mining and processing facilities may also result in long-term, regional (occurring over several allotments), minor, indirect impacts to livestock grazing that would last until vegetation establishes after reclamation is completed. However, livestock grazing within the Plan boundary is likely limited due to the 654 acres of existing disturbance within the Project boundary, and because the vegetation communities within the Plan boundary primarily consists of pinyon-juniper woodland. Reclamation activities associated with the Proposed Action may result in better livestock forage area than currently exists, once vegetation is established after reclamation. See Section 3.7 for a complete analysis of impacts to livestock grazing. Mining and processing facilities would have no impact on areas considered prime farmland by the NRCS.

MMI would reclaim approximately 975 acres (1,129 acres minus the 154 acres of mine features that would not be reclaimed) of Project related disturbance (approximately 86 percent of the total Project related disturbance), as well as an additional approximately 25 acres of non-MMI disturbance (1,000 acres of total reclamation), and would provide a post-mining surface condition that would be consistent with the expected long-term land uses which include wildlife habitat, livestock grazing, and possible future mining-related activities. Approximately 154 acres (approximately 14 percent of the total mine related disturbance), including the pits, ponds, roads and stormwater diversion channels, would remain as post reclamation features, which may result in permanent, localized, indirect impacts to land uses within the area of analysis. However, the majority of mine related disturbance would be reclaimed, which would reduce long-term impacts to land uses in the area of analysis. The majority of the post mine features are already existing features (i.e., pits, WRDAs, and roads) within the Project boundary that would be expanded as part of Project operations. Because the majority of the features that would not be reclaimed are already existing features in the landscape, and because there is adequate area for multiple use

authorizations surrounding the Project boundary, impacts to land use from the facilities not reclaimed is anticipated to be permanent, localized, and minor.

The Proposed Action would not result in impacts or changes to land ownership within the area of analysis. Mining and processing facilities would not result in conflicts, substantial modifications or termination of the ROWs or land use authorizations detailed in **Table 3.10-2**. No ROW relocations would be required as a result of the Proposed Action. Mining and processing facilities would not result in the disruption or division of an established community in the area of analysis. The closest community to mining and processing facilities is the Town of Eureka which is located approximately 30-miles southeast of the Project. Short-term, localized, minor, indirect impacts to the Town of Eureka may occur from the additional housing required for mine employees and contractors which may disrupt the local community due to potential housing and accommodation shortages. If housing is required outside of the Town of Eureka, this impact would be regional. This impact would last during construction and mining operations which are estimated to last approximately seven years (i.e., five years of active mining and heap leaching plus two years of residual heap leaching) with an additional four months of pit pre-stripping. See Section 3.15 for a detailed analysis of impacts to social and economic values associated with the Proposed Action.

Access to mining and processing facilities is described in Section 2.2.2. Public access would not be prohibited on the access roads, and these access roads would remain open for public access during mining operations. However, indirect, temporary restrictions or delays may result to public access from mine associated traffic using the access roads, and during the construction of the improvements on North Roberts Creek Road (NVN-052399) and the water supply pipeline. These temporary delays are not anticipated to result in any significant delays to public access on these roads, or access to land uses adjacent to the Project area. Impacts to public access on the access roads from the Proposed Action are anticipated to be short-term, localized, and negligible. Easements across private land would not be required for the Atlas Haul Road as there is a Prior Existing Right as the road existed prior to the patents being granted. The road is documented in the Mineral Surveys for the Patent Application as an existing road and access through the patent cannot be restricted as the road existed prior to the patents being granted (BLM, 1986a, 1986b, and 1986c).

Use of the parking lot in the town of Eureka would have short-term, localized, negligible impacts on multiple land use authorizations since it is on private land. Use of the lot for parking vehicles would prevent it from being used for other land uses during mining operations, but this would be a negligible impact on a relatively small lot.

Transportation

It is estimated that an average of 30 employees would be bussed for each shift (approximately 35-day shift and 25-night shift), for a total of 60 employees per day. Employees would be bussed to the mine facilities using three 12- to 15-passenger vans for each shift. The mine would run with two shifts, a morning shift and a night shift, with four rotating crews to provide for seven days per week, 365 days per year coverage. Traffic associated with processing would occur internal to the Plan boundary on the Project mine roads and haul road, which would not impact roads external

to the mining operations. Traffic generation on the Roberts Creek Road route is anticipated to be 20 light vehicles per shift (i.e., 10 vehicles entering the site and 10 vehicles exiting the site per shift), for a total of 40 trips per day. Bussing the employees to the Project site would result in three vans using Roberts Creek Road for each shift during mining operations, with six round- trips for the vans per shift (i.e., three vans entering the site and three vans exiting the site per shift). This would result in 12 total round-trips per day from the vans on the Roberts Creek Road route for the life of mining operations. Additional traffic generation includes: two additional round-trips on the Roberts Creek Road route for transport of the blasting crew during the day shift (i.e., one vehicle entering the site at the start of the day shift and one vehicle exiting the site at the end of the day shift); eight additional round-trips per shift from management pickups that would travel to the site on the Roberts Creek Road route (i.e., four vehicles entering the site and four vehicles exiting the site per shift); and four additional round-trips per shift from light vehicles as needed for operations (i.e., two vehicles entering the site and two vehicles exiting the site per shift). Large vehicle traffic generation is estimated at 10 round trips per day on Three Bars Road. It is assumed that the majority of mine employees would live or stay in the Town of Eureka. As a result, there would be no additional anticipated impacts on State Route 278 from employees driving to the park-and-ride location. However, this may increase traffic on U.S. 50 in the Town of Eureka during shift changes. Assuming that 30 employees would be bussed per shift, and assuming that each employee would drive to the park-and-ride location, this may increase traffic within the Town of Eureka by an additional 60 round-trips per shift (i.e., 30 trips to the park-and-ride location and 30 trips exiting the park-and-ride location per shift would be generated within the Town of Eureka), for a total of an additional 120 trips per day from employees entering and exiting the site. In addition, it is assumed the 28 light vehicles per day that would travel to the site that would not use vans as specified above (i.e., the blasting crew, management pickups, and as needed light vehicles that would stay in Eureka County), which would generate an additional 28 vehicle trips per day in the Town of Eureka.

AADT increases from the Proposed Action on U.S. 50 would be short-term and minor, and would only be noticeable during shift changes. As is shown by the existing AADT on Roberts Creek Road detailed in **Table 3.10-3**, Roberts Creek Road and Three Bars Road do not receive heavy daily traffic. Estimated AADT baseline conditions for Roberts Creek Road is approximately 10 AADT. There is no traffic monitoring station on Three Bars Road to determine estimated AADT baseline conditions for Three Bars Road, but it is assumed that traffic generation on Three Bars Road is similar to Roberts Creek Road (i.e., 10 AADT). The Proposed Action would add an additional 40 trips per day on Roberts Creek Road, and a maximum of 10 trips per day on Three Bars Road. Whereas this does result in an increase of daily traffic above baseline conditions, MMI would maintain these roads in coordination with Eureka County, so impacts from this traffic increase would be short-term, regional, and minor. These roads are constructed, or would be constructed, to an appropriate width to accommodate this additional traffic. In addition, MMI has substantially reduced the level of traffic that would potentially be generated on these roads by implementing a park-and-ride program which utilizes three busses for each shift, rather than each employee individually driving to the site. Additional temporary, localized, negligible traffic generation may occur from maintenance of the water pipeline and well site.

4.10.2.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts on lands, realty and transportation include:

- The loss of approximately 946 acres of public land for multiple use authorizations for the life of the Project;
- Access being prohibited within the 127 acres of mining and processing facilities that would be fenced at the administration and process area, and at the generator and water storage area by GBPW-210;
- Access delays resulting from mine related traffic on Three Bars Road and North Roberts Creek Road, as well as delays associated with construction of the improvements to North Roberts Creek Road and the water supply pipeline; and
- Increases in traffic on affected routes resulting from mining and processing operations.

4.10.2.2 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments for lands and realty include the approximately 154 acres of pits, ponds, roads and stormwater diversion channels that would remain as post reclamation features. Irretrievable commitments of lands, realty and transportation include the loss of approximately 946 acres of public land for multiple use authorizations for the life of the Project, traffic increase on affected routes, and access delays and restrictions on affected roadways that may occur during mining and processing operations. However, of the 946 acres of mine related disturbance, approximately 281 acres (not including authorized exploration activities) (approximately 30 percent) is existing disturbance that is already impacting land use.

4.10.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The impacts discussed above would largely be short-term, lasting during the one year of project construction, and the seven years of Project operations (i.e., five years of active mining and heap leaching plus two additional years of residual heap leaching), or at the most until Project closure is completed, which is anticipated to be approximately six years following cessation of mining and active leaching on the HLP. Permanent impacts would include those impacts from those facilities not reclaimed, including the pits, ponds, roads and stormwater diversion channels, during Project closure. There would also be a potential long-term increase in land use and realty opportunities, since the Proposed Action would reclaim 420 acres of the existing 654 acres of existing disturbance within the Project boundary. This would provide additional area for land uses to occur, including livestock grazing and recreation, that would be limited if the Proposed Action were not implemented.

4.10.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. The 40-foot permanent power line ROW would encompass approximately 138 acres of public land administered by the BLM, and approximately six acres of private land. However, approximately 14 acres of the ROW

on public land would not be disturbed because it would be outside of the cultural survey clearance area. In addition, approximately 23 acres of the distribution line ROW on public land would be within the existing Mount Wheeler ROW for the Atlas 25 kV overhead distribution line (NVN-047781), and the existing Atlas 25 kV overhead distribution line would be utilized in this area.

This alternative would result in an additional direct loss of 124 acres of public land for multiple use authorizations, and six acres of private land, for the life of the distribution line. However, the majority of the distribution line would be within an existing powerline corridor (i.e., the Falcon to Gonder Corridor or the Atlas 25 kV corridor), or would follow an existing road (i.e., North Roberts Creek Road). Impacts to multiple use authorizations from this alternative would be short-term, regional, and negligible because the distribution line would be within an existing power line corridor, or would follow an existing road. An easement would need to be acquired on private land, which would result in direct, short-term, localized impacts to land use on private land. However, the majority of the area where the distribution line would cross private land follows an existing power line corridor, or an existing road, so impacts would be negligible to land use on private land. Because this alternative would primarily follow existing power line corridors, or an existing road, there would be no conflict with any of the ROWs detailed in **Table 3.10-4**.

Since the center line travel road would occur entirely within the 40-foot permanent power line ROW, no additional disturbance impacts to land use would occur from accessing the distribution line. Additional traffic may be generated on existing roads in order to access this alternative during construction of the distribution line, which would take approximately six months to complete. Construction traffic is assumed to be two pickups carrying construction crew, one hi ranger, one backhoe, one linebed, one service truck, and one trailer. Estimated traffic generation from this alternative is 14 trips per day round-trip along U.S. 50, Roberts Creek Road and the center line travel road and existing access roads for the six months of distribution line construction. This would be a temporary, direct, localized impact, but would be negligible, and would primarily consist of public access delays on some of the existing roads during construction of the distribution line.

This alternative would not result in the disruption of the physical arrangement of established communities. Impacts are considered to be temporary (during construction) but localized and negligible.

4.10.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts on lands, realty and transportation would be the same as the Proposed Action, but would also include:

- The loss of an additional 124 acres of public land for multiple use authorizations for the life of the Project; and
- Temporary traffic increase and access delays resulting from construction of the distribution line.

4.10.3.2 Irreversible and Irretrievable Commitments of Resources

Irretrievable commitments of lands, realty and transportation include the loss of approximately 124 acres of public land (including the cultural avoidance area) for multiple use authorizations for the life of the Project, traffic increase and access delays on existing roads during construction of the distribution line. The distribution line would be fully reclaimed after closure of the Project so no additional irreversible commitment of resources would occur to land use under this alternative.

4.10.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The impacts discussed above would largely be temporary, lasting during the six months of construction, and during the life of the mine.

4.10.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. Maximum traffic generation on Three Bars Road from this alternative would be the same as the Proposed Action. Traffic impacts on Roberts Creek Road described under the Proposed Action would not occur under this alternative. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Construction and maintenance of the water supply pipeline would generate temporary, localized, and negligible traffic impacts.

4.10.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be the same as described for the Proposed Action, except traffic impacts on Roberts Creek Road would not occur, besides for construction and maintenance traffic on North Roberts Creek Road associated with the water supply pipeline.

4.10.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action, except traffic impacts on Roberts Creek Road would not occur, besides for construction and maintenance traffic on North Roberts Creek Road associated with the water supply pipeline.

4.10.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.10.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle

access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. This alternative would add an additional 40 trips per day on State Route 278 from what is described under the Proposed Action. In addition, this alternative would increase traffic generation on the Mount Hope access road and Mount Hope well field road by 40 trips per day. However, because the Mount Hope Project is not currently in operation, traffic generation numbers for the Mount Hope Project would not be considered baseline conditions, but are instead reasonably foreseeable future traffic generation. However, a detailed analysis of the traffic generation impacts from the Mount Hope Project, and how they relate to this alternative are discussed under the cumulative impacts section for Land Use, Access, Realty, and Transportation. Since the Mount Hope Project is currently not in operation, the additional 40 vehicles per day on Mount Hope access and well field roads would result in a short-term, regional, minor impact to transportation. The additional 40 trips per day on State Route 278 would be a short-term, regional, minor impact.

4.10.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be the same as described for the Proposed Action, except traffic impacts on the Roberts Creek Road would not occur, and there would be an additional 40 trips per day on State Route 278, Mount Hope access road, and Mount Hope well field road.

4.10.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action, except traffic impacts on the Roberts Creek Road would not occur, and there would be an additional 40 trips per day on State Route 278, Mount Hope access road, and Mount Hope well field road.

4.10.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.10.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action). This may be a permanent, localized impact, as multiple use authorizations would not benefit from having these areas reclaimed (i.e., more productive vegetation for livestock grazing or reduced impacts to the recreation setting). Land uses adjacent to and within the Project area would continue to include mining and mineral exploration, livestock grazing, agriculture, woodland products harvesting, recreation, and wildlife habitat. The BLM administered land within the Project

area would remain available for multiple-use actions as approved by the BLM. Traffic conditions within the Project boundary, and US 50 and State Route 278 would remain at baseline conditions. Short-term and permanent, localized, negligible impacts to land use, access, realty, or transportation are expected from this alternative.

4.11 Native American Cultural Concerns

4.11.1 Indicators

The indicator considered in the analysis of potential impacts to Native American concerns is whether the Proposed Action would result in adverse effects to properties of traditional religious and cultural importance, TCPs, or sacred sites.

Specific statutes, regulations, and EOs guide consultation with Native Americans to identify places of traditional cultural importance (e.g., TCPs, properties of traditional religious and cultural importance, sacred sites) and to address tribal concerns about potential impacts to these resources. These include the NEPA, NHPA, AIRFA, NAGPRA, EO 13007, and EO 13175 (Consultation and Coordination with Indian Tribal Governments). These statutes and regulations direct federal agencies to consult with Native American tribal leaders and others knowledgeable about resources that are important to them and their way of life. Consultation is conducted for federal actions, such as decisions about the Project, that have the potential to affect locations of traditional concern, areas where religious ceremonies are conducted, areas of traditional cultural uses, archaeological sites (including burials/gravesites), and other modern and ancestral tribal resources.

Effects Context for Native American Cultural Concerns

Localized: Effects would be limited to eligible sites within the Project area.

Regional: Effects would occur to eligible sites outside of the cultural direct effects APE

Duration of Effects Definitions for Native American Cultural Concerns

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5[a][2]). There are three possible effects determinations:

Intensity of Effects Definitions for Native American Cultural Concerns

No Historic Properties Affected: A “no historic properties affected” determination indicates that no historic properties are in the APE, or that there are historic properties in the APE, but the undertaking would not alter the characteristics that qualify it for inclusion in or eligibility for the NRHP.

No Adverse Effect: A “no adverse effect” determination indicates that there would be an effect on the historic property by the undertaking, but the effect does not meet the criteria of adverse effect in 36 CFR 800.5(a)(1) and would not alter any of the characteristics that make it eligible for listing in the NRHP in a manner that would diminish the integrity of the historic property.

Adverse Effect: An adverse effect indicates that the undertaking would alter, directly or indirectly, any of the characteristics that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of the property.

4.11.2 Direct and Indirect Impacts of the Proposed Action

Potential Effects of the Proposed Action

Direct and indirect impacts to a place of traditional cultural importance, including burials/gravesites, as a result of the Project would be the same as described for cultural resources in Section 4.3 (Cultural Resources). To date, no TCP, property of traditional religious cultural importance, or sacred site has been identified by the tribe or bands participating in the government-to-government consultation process or through cultural resources inventories.

Resolution of Effects

Tribal consultation currently is ongoing and would continue through Project completion. If a place of traditional cultural importance is identified by tribal representatives and avoidance is not feasible, specific operating procedures, stipulations, or mitigation measures would be developed in consultation with the affected tribal groups with the goal of reducing or eliminating impacts to the identified resource. If mitigation is required at a site listed, or eligible for listing, on the NRHP, an HPTP would be developed and approved by the BLM and SHPO. Tribal representatives would be asked to participate in the development of any such treatment plan.

The potential for the inadvertent discovery of human remains during construction activities exists within proposed disturbance areas and could result in adverse effects. If construction or other Project personnel discover what may be human remains, funerary objects, or items of cultural patrimony on BLM-administered land, all construction activities would cease within the vicinity of the discovery. The location of the find would not be publicly disclosed, and the remains would be secured and preserved in place. MMI or its contractors would immediately notify the BLM Authorized Officer of the discovery, followed by written notification. Treatment of the remains would be handled in accordance with the unanticipated discoveries plan included in the MOA. Construction would not resume in the area of the discovery until the BLM Authorized Officer has issued a Notice to Proceed.

4.11.2.1 Unavoidable Adverse Impacts

If a place of traditional cultural importance is identified within the Project area by tribal representatives and would be adversely affected, the effects would be minimized or mitigated in accordance with the MOA and EPMs. Unanticipated discoveries that may be unearthed during construction activities would be treated as outlined in the unanticipated discoveries plan included

in the MOA. With implementation of the MOA and EPMs, unavoidable adverse impacts to places of traditional cultural importance are not anticipated as a result of the Proposed Action.

4.11.2.2 Irreversible and Irretrievable Commitments of Resources

No irreversible and irretrievable impacts to places of traditional cultural importance are anticipated as result of the Proposed Action. To date, no places of traditional cultural importance have been identified in the Project area through the tribal consultation efforts or cultural resources inventories.

4.11.2.3 Relationship of Short-Term Uses and Long-Term Productivity

To date, no places of traditional cultural importance have been identified in the Project area through the tribal consultation efforts or cultural resources inventories.

4.11.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Direct and indirect impacts would be the same as described for the Proposed Action.

4.11.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be similar to those identified for the Proposed Action.

4.11.3.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources would be the same as described for the Proposed Action.

4.11.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between local short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.11.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells.

4.11.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be similar to those identified for the Proposed Action.

4.11.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources would be the same as described for the Proposed Action.

4.11.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between local short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.11.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. Direct and indirect impacts would be the same as described for the Proposed Action.

4.11.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be similar to those identified for the Proposed Action.

4.11.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources would be the same as described for the Proposed Action.

4.11.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship between local short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.11.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not be implemented. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. Any potential impacts to places of traditional cultural importance (including unanticipated discoveries) that may have occurred under the Proposed Action would not occur under this alternative. To date, no places of traditional cultural importance have been identified in the area of the Notice-level exploration activities. No impacts to places of traditional cultural importance are expected from this alternative.

4.12 Noise

The environmental consequences from noise to people from the Proposed Action and alternatives are discussed in this section, impacts from noise to Wildlife are discussed in Section 4.21.

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; or
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. However, there is no completely satisfactory way to measure the subjective effects of noise of the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise would be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of one dBA cannot be perceived;
- Outside of the laboratory, a three dBA change is considered a just-perceivable difference;
- A change in level of at least five dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness (Brennan, 2016).

4.12.1 Indicators

Indicators for significant effects to people from noise are based on the context, duration, type, and intensity of impacts that may result from the implementation of the Proposed Action or alternatives. Specifically, impacts associated from noise caused by the Proposed Action or alternatives would be considered to have an effect on humans if one or more of the following occurred:

- Conflicts with existing federal, state, or local laws, management plans, or policies; and/or
- Noise level of 55 L_{eq} for 24 hours or greater time amount.

Effect Context for Noise

Localized: Effects would occur within the area of analysis.

Regional: Effects would occur outside of the area of analysis.

Temporary: Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.

Duration of Effects Definitions for Noise
Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Intensity of Effects Definitions for Noise
Negligible: Changes in background noise levels from activities associated with the proposed Project would not be perceptible, and would not conflict with noise thresholds set forth in federal, state, or local laws and management plans.

Minor: Changes in background noise levels from activities associated with the proposed Project would be perceptible, but would not conflict with noise thresholds set forth in federal, state, or local laws and management plans. Applicant-committed EPMs and BMPs would minimize impacts to surrounding communities.

Moderate: Changes in background noise levels from activities associated with the proposed Project would be perceptible, and may result in elevated noise levels at communities close to project operations. Mitigation measures beyond applicant-committed EPMs and BMPs may be required to be in compliance with noise thresholds set forth in federal, state, or local laws and management plans, but they would most likely be effective.

Major: Changes in noise levels from activities associated with the proposed Project would be readily perceptible within and outside the area of analysis. The Project would result in conflicts with existing noises thresholds set forth in federal, state, or local laws and management plans. Mitigation measures beyond applicant-committed EPMs and BMPs may be required to be in compliance with noise thresholds set forth in federal, state, or local laws and management plans, but they would most likely be effective.

4.12.2 Direct and Indirect Impacts of the Proposed Action

Impacts to noise levels from the Project would be related to construction and operation. Noise impacts during operation would occur from mining, blasting, and travel along roads.

The ambient noise level data for the Three Bars Ranch and Roberts Creek Ranch are included in **Table 3.12-2**. The assumed ambient noise level was the typical average daytime and nighttime values for the seven days of monitoring at each ranch site. These were calculated to be 44 dBA L_{eq} for Three Bars Ranch and 45 dBA L_{eq} for Roberts Creek Ranch.

Table 4.12-1 compares the typical ambient noise levels with the modeled Project noise levels, provides the increase dBA over ambient, and whether the increase results in an increase over the standard. It should be noted that this analysis is considered to be conservative as it assumes continuous mining operations occurring each of the Project pits and dumps sites and all haul roads being actively used with approximately one haul truck every two minutes (30 trucks per hour) and miscellaneous vehicles.

Table 4.12-1 Predicted Mining Noise Levels at Receivers

Receiver	Typical Ambient Noise Levels	Modeled Project Noise Levels[1]	Increase Over Ambient	Standard	Exceeds Standards
Three Bars Ranch	44 dBA L_{eq}	7 dBA L_{eq}	0 dBA	55 dBA L_{eq}	No
Roberts Creek Ranch	45 dBA L_{eq}	39 dBA L_{eq}	0 dBA	55 dBA L_{eq}	No

Source: Brennan, 2016

[1] The three main sources contributing to the Project noise at the Roberts Creek Ranch site include the well generator (33 dBA), followed by generator two (29 dBA) and generator one (29 dBA).

The Project is not predicted to generate hourly noise levels exceeding the EPA exterior noise criteria of 55 dBA L_{eq} at either of the two ranches. The impacts from noise are expected to be minor, localized, and short-term, lasting for the duration of mining.

Blasting would be conducted to break up the rock for hauling and processing. Blasting would typically occur once per day. In general, blasting is controlled using micro delays between holes and limiting charge size to minimize dispersal of the rock fragments and to ensure the safety of the workers. As outlined in the Blasting Plan, fenceline noise and seismic monitoring, as well as air blast monitoring, may be performed periodically to ensure that proper sound and vibration levels are maintained. This monitoring may also be performed at the nearby ranch facilities. As outlined in the Plan, blasts would be initiated between noon and 5:30 PM to minimize noise disturbing any nearby greater sage-grouse leks (MMI, 2016a).

As a result of their frequency content and brief duration, blasting noise levels are difficult to predict in terms of A-weighted sound pressure levels. No noise propagation models are known to exist to predict the audible noise due to blasting, and the typical noise prediction models do not predict sound propagation for frequencies below 25 Hz (upper limit of the dominant blast frequency). The audible sound associated with blasting is reported to be the result of escaping gases and falling (slumping) rock. Subjectively, audible blasting sound has been described as similar to the closing of a car trunk, or to rolling thunder. While these terms are subjective rather than quantitative, the described sounds are relatively benign. Audible noise due to blasting is not expected to be a major source of annoyance since blasting for the Project would be controlled to meet safety standards, although it would be audible and may startle people nearby under certain circumstances (Brennan, 2016). Noise impacts from blasting are expected to be minor, localized, and short-term, lasting for the duration of Project.

Any noise generated from vehicles parking or leaving the parking lot in the town of Eureka would be short term and negligible.

4.12.2.1 Unavoidable Adverse Impacts

The Proposed Action would generate unavoidable noise; however, the level of these unavoidable impacts would be minor, localized, and short-term.

4.12.2.2 Irreversible and Irretrievable Commitments of Resources

There would no irreversible or irretrievable commitment of resources under the Proposed Action.

4.12.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The impacts discussed above would continue for the life of the Project operations. No impacts from noise are expected following Project reclamation.

4.12.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Impacts from noise to humans under this alternative would be the same as those described for the Proposed Action for mine construction, operation, and blasting. There would be some temporary noise generated during construction of the distribution line; however, this noise would not be detectable at Three Bars Ranch, or would be minimal, at Roberts Creek Ranch, so impacts would be temporary, localized, and negligible. Therefore, impacts under this alternative would be the same as described for the Proposed Action.

4.12.3.1 Unavoidable Adverse Impacts

This alternative would generate unavoidable noise; however, the level of these unavoidable impacts would be minor, localized, and short-term.

4.12.3.2 Irreversible and Irretrievable Commitments of Resources

There would no irreversible or irretrievable commitment of resources under this alternative.

4.12.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The impacts discussed above would continue for the life of the operations. No impacts from noise are expected following reclamation of the ROW area.

4.12.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Impacts from noise to humans under this alternative would be the same as those described for the Proposed Action for mine construction, operation, and blasting. There would be no noise generated from Project-related travel along Roberts Creek Road under this alternative, but according to the analysis noise along this road was not a top contributor to noise detected at the Roberts Creek Ranch. Therefore, impacts from this alternative would be the same as described for the Proposed Action.

4.12.4.1 Unavoidable Adverse Impacts

This alternative would generate unavoidable noise; however, the level of these unavoidable impacts would be minor.

4.12.4.2 Irreversible and Irretrievable Commitments of Resources

There would no irreversible or irretrievable commitment of resources under this alternative.

4.12.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The impacts discussed above would continue for the life of the operations. No impacts from noise are expected following reclamation.

4.12.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. Impacts from noise to humans under this alternative would be the same as those described for the Proposed Action for mine construction, operation, and blasting. There would be additional noise generated from travel along Mount Hope roads under this alternative. However, this additional travel would likely not be audible from the ranches. Therefore, impacts from this alternative would be the same as described for the Proposed Action.

4.12.5.1 Unavoidable Adverse Impacts

This alternative would generate unavoidable noise; however, the level of these unavoidable impacts would be minor.

4.12.5.2 Irreversible and Irretrievable Commitments of Resources

There would no irreversible or irretrievable commitment of resources under this alternative.

4.12.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The impacts discussed above would continue for the life of the operations. No impacts from noise are expected following reclamation.

4.12.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in Section 2.2.14, which would generate noise associated with the exploration operations. Authorized Notice-level exploration operations would continue, which would result in negligible, localized, and short term noise impacts at the Three Bars Ranch and the Roberts Creek Ranch.

4.13 Paleontological Resources

4.13.1 Indicators

Impacts to paleontological resources were evaluated by considering if the Proposed Action or alternatives would result in direct disturbance to scientifically significant fossils.

Effect Context for Paleontological Resources

Localized: Effects would be limited to the Project area.

Regional: Effects would extend beyond the Project area and would impact the overall paleontological resources in the region.

Temporary: Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.

Duration of Effects Definitions for Paleontological Resources

Short-term: Effects would last through the life-of-mine operations.

Long-term: Effects would extend beyond the life-of-mine operations.

Permanent: Since paleontological resources (rock formations, fossil-bearing strata, and fossils) are essentially non-renewable, ground disturbance that directly impacts paleontological resources would be permanent.

Intensity of Effects Definitions for Paleontological Resources

Negligible: Effects on paleontological resources would be small and not of perceptible consequence. Geologic strata yielding little information on paleontological potential would be encountered. None to few fossils would likely be encountered by the proposed activities.

Minor: Effects would occur to geologic strata considered to possibly yield information on paleontological potential, yet effects to fossils would be minimized with applicant-committed EPMs or BMPs. There would be a low probability of effects to fossils due to ground-disturbing activities; none to few fossils would likely be encountered by the proposed activities.

Moderate: Effects on paleontological resources would occur, and may occur over a relatively large area. Effects to fossils due to ground-disturbing activities would be predicted; several to many fossils may be impacted.

Major: Effects on paleontological resources would occur, and would substantially change the geologic characteristics over a large area. There is a high probability of intercepting fossils during ground-disturbing activity; many fossils would likely be lost.

4.13.2 Direct and Indirect Impacts of the Proposed Action

The Proposed Action would include expansion of the existing Gold Ridge and Gold Pick open pits as well as development of two pits at the newly discovered Cabin Creek gold deposit, mining ore from the Bartine Member of the McColley Canyon Formation. Waste rock dumps would be placed in-pit where space and timing allow, and at surface adjacent to the resultant pits. The heap leach facility would be placed atop Quaternary sediments of 10- to 50-foot depth that partially overlie the Devonian Upper Devils Gate Formation; neither formation has been identified to have potential for significant paleontological resources in this area (PFYC 2).

The proposed final footprints of Gold Pick, Cabin Creek and Gold Ridge mine pits are displayed in **Figures 2.2-3**, **2.2-4**, and **2.2-5**, respectively. The Bartine Member of the McColley Canyon Formation would be excavated further in the existing Gold Pick and Gold Ridge pits and opened at the new Cabin Creek deposit, exposing any contained paleontological resources. The Bartine Member, host for fragmental placodermi in the area, is also host for the gold orebody to be mined under the Proposed Action. The Project would have permanent, localized, minor impacts to the paleontological resource directly through mining and processing activities. The Proposed Action would affect the resource indirectly in that the exposures in the remnant mine benches would leave this resource accessible to vandalism and theft after mine closure, which would be a long-term, localized, minor impact. The remnant mine benches would, however, also provide new exposures for academic study, likewise an indirect effect of the Proposed Action. The EPM for Paleontological Resources described in Section 2.2.20 provides for protection of the resource in the event of discovery during the Proposed Action, and thereby minimizes impacts to the resource through cessation of work until notice to proceed is issued by an Authorized Officer. As a result, the Project would have both long-term and permanent, localized, minor impacts to paleontological resource from mining activities.

The existing access roads are not proposed for additional disturbance beyond their existing respective road base prisms. They are all within various Quaternary alluvial and colluvial sediments and are anticipated to have short-term, localized, negligible impacts to the paleontological resources. The proposed waterline is to be buried in the disturbance corridor of the Project's secondary access road for its length, and otherwise entails a temporary disturbance of 20-foot width during construction, likewise hosted in Quaternary alluvial sediments.

The Atlas Haul Road also is sited in the Devonian Webb and Devils Gate Formations, both of which are identified as having moderate potential for hosting common invertebrate fossils (PFYC 2). The Atlas Haul Road, however, is proposed to be kept within its current road prism with its surface disturbed only by maintenance activities including addition of supplemental surfacing aggregate when required – short-term, localized, negligible impacts to paleontological resources along the Atlas Haul Road are anticipated as a result of the Proposed Action. North Roberts Creek Road and the water pipeline, hosted in Quaternary sediments, are anticipated to have short-term, localized, negligible impacts to the paleontological resources.

The Devonian Upper Denay formation was identified as a host for fragmental placodermi regionally and within the area boundary of the Proposed Action (Firby, 1992) (PFYC 3a). Disturbance within the Denay could be considered an indicator for impact to the resource. No vertebrate fossils, however, were found to be hosted in the Denay in the area of concern, and the formation would not be impacted by the Proposed Action. Impacts to paleontological resources from the Proposed Action are anticipated to be short-term, localized, and negligible.

Use of the parking lot in the town of Eureka would have short-term, localized, negligible impacts paleontological resources because the lithologies within the parking area are older alluvial deposits from the Miocene to Quaternary age, and are considered low potential, PFYC 1 or 2. Furthermore, the lot has already been improved with compacted gravel.

4.13.2.1 Unavoidable Adverse Impacts

Mining conducted in the Proposed Action would blast, remove, and crush the host formations for vertebrate and invertebrate fossils. Any significant resources within the mine pits would be impacted by these activities. These impacts would be permanent, localized, minor and unavoidable because the host for fossils is also the host for the gold mineralization.

4.13.2.2 Irreversible and Irretrievable Commitments of Resources

At the Gold Pick open pit, prior exposures in the mine pit of invertebrate fossils contained several types of brachiopods, tabulate corals, bryozoans, trilobites, and nautiloid cephalopods. The identified invertebrates are noted as being common to the Middle Devonian time period across North America (Firby, 1992; Tasch, 1980). These exposures in the Gold Pick pit have been used for academic purposes by the University of Nevada – Reno for student field instruction. Mining activities in the Proposed Action would impact these exposures by blasting and by removal of materials, constituting an irreversible commitment of the paleontological resources.

4.13.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Mining at this site would create new exposures for inspection and assessment of additional paleontological resources that would not be available naturally until exposed by erosion in the distant future, particularly of the lithology known to host vertebrate (placoderm) fossils. Although the proposed partial backfill of the Gold Pick pit might bury fresh exposures of invertebrate fossils and prevent future access for scientific uses including education, portions of the Gold Pick pit are proposed to remain open under closure plans in the Proposed Action (**Figure 2.2-1**). The Proposed Action would have Short-term, long-term and permanent, negligible to minor effects on the paleontological resources of the region.

4.13.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Impacts from this alternative would be similar to the direct and indirect impacts of the Proposed Action. The disturbances for the installation of the distribution line would be primarily in Quaternary and Holocene sediments which have low potential fossil yield classifications, with

minor distribution line segments founded in Devils Gate Limestone and/or Vinini Formation which have low to moderate potential fossil yield classifications.

4.13.3.1 Unavoidable Adverse Impacts

This alternative would have no unavoidable adverse impacts on the paleontological resources beyond those described for the Proposed Action.

4.13.3.2 Irreversible and Irretrievable Commitments of Resources

This alternative would have no irreversible or irretrievable commitments of the paleontological resources beyond those commitments described for the Proposed Action.

4.13.3.3 Relationship of Short-Term Uses and Long-Term Productivity

This alternative would add short-term, regional (since the 25 kV powerline is outside of the Project area), negligible effects beyond those effects described for the Proposed Action. The long-term productivity for the resource caused by this alternative would be negligible. Access to the resource over the long term would not be increased or decreased by installation of the overhead distribution line.

4.13.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. This alternative would have the same direct and indirect impacts on the paleontological resources as the impacts of the Proposed Action.

4.13.4.1 Unavoidable Adverse Impacts

The unavoidable adverse impacts of this alternative would be the same adverse impacts to the paleontological resources as the impacts of the Proposed Action.

4.13.4.2 Irreversible and Irretrievable Commitments of Resources

The commitments of resources for this alternative would be the same commitments as those described for the Proposed Action.

4.13.4.3 Relationship of Short-Term Uses and Long-Term Productivity

This alternative would impact the short-term uses and long-term productivity of the resource are the same as described in the Proposed Action.

4.13.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. The maintenance of these existing roads, hosted in formations with low potential fossil yield classification, for light vehicle traffic would prevent access to underlying paleontological resources for the life of the Proposed Action, which would be a short-term, regional (since the Mount Hope access road and well field road are outside of the Project boundary), negligible impact.

4.13.5.1 Unavoidable Adverse Impacts

The unavoidable adverse impacts this alternative would be the same as the unavoidable adverse impacts of the Proposed Action.

4.13.5.2 Irreversible and Irretrievable Commitments of Resources

Under this alternative, the irreversible commitments of paleontological resources would be the same as those of the Proposed Action.

4.13.5.3 Relationship of Short-Term Uses and Long-Term Productivity

This alternative would have negligible effects on the paleontological resources for the region. The long-term productivity of this resource would remain intact.

4.13.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Proposed Action would not be implemented and no mining would occur. There would be no additional exposure of lithologies in the existing mine pits. There would be no reclamation of certain existing mine pits; exposures of the fossiliferous McColley Canyon Formation in the Gold Pick pit would remain open for scientific access. Under this alternative, up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities which is not expected to impact paleontological resources.

4.14 Recreation

4.14.1 Indicators

Impacts on recreation and wilderness areas caused by Project construction or operation were evaluated by determining the potential for:

- Conflicts with existing federal, state, and local recreation management plans and policies;
- Nonconformance with the Wilderness Act of 1964 or the BLM Interim Management Policy for Lands Under Wilderness Review;

- Conflicts with formally established recreational uses of the area, including changes in access to existing recreation opportunities, or changes in the level of use of existing recreation areas;

- The potential to substantially degrade or reduce the quantity or quality of the area available for existing or future recreational opportunities; or

- Unmitigated loss of a unique recreational resource.

Effect Context for Recreation

Localized: Proposed activities would affect recreational activities and recreationists within the Project area.

Regional: Proposed activities would affect recreational activities and recreationists outside of the area of analysis to the larger region.

Duration of Effects Definitions for Recreation

Temporary: Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Permanent: Effects to recreation would be permanent.

Intensity of Effects Definitions for Recreation

Negligible: Recreationists may notice changes to the recreational setting, but proposed activities would not affect their experience. The quality, quantity, and use of recreation areas would not be impacted to a measurable or detectable level. There would be no conflicts with existing federal, state, and local statutes or management plans.

Minor: Recreationists may notice changes in recreational setting and the availability of recreational opportunities, and these changes may affect the recreational experience. Impacts to the quality, quantity, and use of recreation areas may be measurable and detectable, and displacement of recreationists to areas outside of the Project area would likely occur. However, overall access to recreational opportunities, and the ability to find comparable recreation experiences would not be affected. Applicant-committed EPMs would effectively minimize impacts to recreational uses in the area.

Moderate: Changes to the recreational setting and availability of recreation opportunities would be measurable and detectable within the Project area. Impacts to the quality, quantity, and use of recreation areas within the Project area would be apparent, and would potentially restrict access to recreational areas, reduce recreational opportunities, and\or reduce the quality of recreational areas. Displacement of recreationists to areas outside of the Project area would occur, but it would

not affect overall access to recreational opportunities outside of the Project area. Mitigation measures beyond applicant-committed EPMs may be necessary to offset adverse effects, but these measures would likely be successful.

Major: Changes to the recreational setting and availability of recreation opportunities would be measurable and detectable within and outside of the Project area. Impacts to the quality, quantity, and use of recreation areas within and outside of the Project area would be apparent. There would likely be restricted access to recreational areas, reduced recreational opportunities, and\or reduced quality of recreational areas. Displacement of recreationists to areas outside of the Project area would occur, and it would impact quality and quantity of recreational opportunities outside of the Project area. Mitigation measures beyond applicant-committed EPMs may be necessary to offset adverse effects, and these measures would need to be monitored to determine their effectiveness.

4.14.2 Direct and Indirect Impacts of the Proposed Action

The Proposed Action would not conflict with the recreation management objectives in the Shoshone-Eureka RMP and associated amendments; the Wilderness Act of 1964, as amended; the FLPMA; or the various BLM manuals and handbooks dealing with recreation management, wilderness areas, and WSAs. Public access would remain open within most of the Project area, and would only be restricted around active mining operations, at the processing area, and by the generator and water storage area by GBPW-210. As a result, it is not anticipated that the Proposed Action would result in significant conflicts with the Eureka County Master Plan as it pertains to recreation, or Titles 8 or 9.

Implementation of the Proposed Action mining and processing facilities would have a short-term, direct effect on recreation through the loss of public lands managed for multiple uses, including dispersed recreation, for the duration of the Project, including closure and reclamation (approximately six years after cessation of mining and residual heap leaching) within the 127 acres that would be fenced within the Project area (consisting of the mining and processing facilities, the administration and process area, and at the generator and water storage area by GBPW-210). There would be no perimeter fencing around the Plan boundary that would preclude recreation use in other areas within the Plan boundary that are not actively being mined. The area around the Project does not provide unique recreational opportunities for the area, and similar recreational opportunities occur in other areas around the Project. Since there is adequate area around the Project boundary for recreation activities, and because recreation activities would only be restricted around the fenced areas, and where active mining operations are occurring, it is anticipated that the loss of recreation activities within the 127-acre fenced area would have short-term, localized, minor impacts on recreation resources.

The Proposed Action mining and processing facilities would result in short-term, direct effects due to access restrictions within the Project boundary. In areas of active mining (including around the open pits and WRDAs), recreation activities would be restricted and would likely result in recreationists using other areas surrounding the Project. Mining activities would reduce the area

available for dispersed recreation on public land (including hunting and wildlife trapping) by approximately 946 acres (not including the non-MMI disturbance to be reclaimed). This is the area of active mining activities. However, there are large areas of public lands that are located adjacent to the Plan boundary that provide the types of dispersed recreation opportunities found within the Plan boundary. The Proposed Action is anticipated to have short-term, localized, minor impacts associated with reduction in available recreation area. Regarding hunting, the Project disturbance would be a small part of the total hunt unit area that the Project falls within. In addition, there is a significant amount of existing disturbance within the Project area from previous operators (approximately 654 acres of previous mine operator disturbance), which likely already results in impacts to hunting activities, so mining and processing facilities are anticipated to have long-term (lasting until vegetation is re-established), but localized, negligible impacts on hunting. Furthermore, the Proposed Action is proposing to reclaim approximately 420 acres of the existing disturbance within the Plan boundary (approximately 63 percent of the existing mine related disturbance), which would likely create better conditions for wildlife and recreation resources in the long-term, and would be a positive impact to hunting and recreation in the long-term.

MMI would reclaim approximately 975 acres of Project related disturbance (approximately 86 percent of the total Project related disturbance), as well as an additional 25 acres of non-MMI disturbance, which would restore recreation activities to pre-Project levels. Approximately 154 acres (approximately 14 percent of the total mine related disturbance), including the pits, ponds, roads and stormwater diversion channels, would remain as post reclamation features, which would result in indirect, long-term impacts to recreation activities within the Plan boundary. However, there is already approximately 654 acres of disturbance (including pits from past mining activities) within the Plan boundary impacting recreation activities. Since the Project would provide reclamation in some form on approximately 86 percent of the Project related disturbance, including reclaiming areas of non-MMI disturbance, impacts to recreation activities resulting from the pits, ponds, roads, and diversion channels that would not be reclaimed is anticipated to be permanent, localized and minor.

No developed or designated recreation sites or facilities would be impacted by the Proposed Action because there are no developed recreation sites within or immediately adjacent to the Project boundary. However, there are numerous undeveloped and non-designated campsites along Roberts Creek that are used throughout the summer and during the fall for hunting season. Increased traffic from Project operations may result in impacts to these areas due to increased vehicle noise and increased human presence. Some of the recreationists using these campsites may move to other areas because of the increased traffic. However, as there is an existing road along Roberts Creek, and because MMI is reducing overall vehicular traffic along Roberts Creek Road by using three passenger vans per shift, the impacts to the recreationists using these undeveloped and non-designated campsites along Roberts Creek would be short-term, regional, and minor.

The Proposed Action mining and processing facilities would have a short-term, minor, indirect effect on surrounding areas due to the displacement of recreationists to these surrounding areas resulting from Project activities. This may have impacts by increasing the recreation use of these

adjacent areas, which would be a short-term, regional, minor impact. In addition, short-term, localized, minor indirect impacts may occur on the recreation setting and experience due to the visual disruption, as well as increased noise levels, resulting from Project activities, particularly for those recreation users seeking experiences of isolation and solitude. However, the Plan boundary is currently not in pristine conditions, and there are numerous roads (which contribute to an existing ambient noise level from human sources [e.g., vehicles]) and existing disturbances within and around the Plan boundary. Areas affected by increased noise levels would be those areas within close proximity to the mining activities because Project noise would attenuate as distances from these features increase. Changes in the level of use of public lands within and adjacent to the Project boundary, and impacts associated with modifying the recreation setting and experience are anticipated to be minor because: 1) there are ample dispersed recreation opportunities elsewhere in the vicinity; and 2) the physical, social, and operational recreation setting of the area would not significantly change from the existing Back Country to Middle Country setting that currently exists (BLM, 2010b).

Reclamation of surface disturbance within the area of analysis would reduce long-term visual disruption resulting from the Proposed Action. However, the mine facilities that would be left as post reclamation features, including the pits, ponds, roads and stormwater diversion channels, would remain visually evident beyond the life of the Project. Visual disruption that would last beyond the life of the Project would be a long-term, indirect impact. However, the area of analysis area, as well as the surrounding area, already includes human modifications, including roads (e.g., Three Bars Road and Roberts Creek Road), existing pits and disturbances from previous mining operations and facilities associated with the Roberts Creek Ranch. One or more of these existing modifications are visible from areas adjacent to the Project area. The short-term and long-term impact the visual disruptions resulting from the Proposed Action would have on recreation resources would be minor because recreation users are already accustomed to human modification within and adjacent to the Project boundary.

Short-term, regional, negligible, indirect impacts may occur because the Proposed Action would result in an increased population in the local region, which may increase demand for recreational opportunities in the area of analysis. Dispersed and developed recreation areas surrounding the area of analysis may be impacted by increased use and demand. This impact is anticipated to be negligible because Project personnel is not expected to exceed 135 employees, and impacts would only occur during mining operations which is anticipated to occur for approximately seven years (i.e., five years of active mining and heap leaching plus two years of residual heap leaching). Potential increased recreation use of the area surrounding the Project is not anticipated to degrade or reduce the quantity or quality of the area available for existing or future recreational opportunities

Use of the parking lot in the town of Eureka would have short-term, localized, negligible impacts on recreation resources since it is on private land.

The Proposed Action would have no direct impact on wilderness areas or WSAs. The Proposed Action conforms with the Wilderness Act of 1964 and the BLM's IMP for WSAs. The Project may

result in indirect visual impacts since the operations may be able to be seen from certain high elevation points from the Simpson Park WSA and the Roberts Mountain WSA. However, there is already significant disturbance within the Project area impacting the viewshed, so this impact is anticipated to be negligible.

4.14.2.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts on recreation resources include:

- The loss of approximately 946 acres of public land for multiple use authorizations for the life of the Project;
- Access being prohibited within the 127 acres of mining and processing facilities that would be fenced at the administration and process area, and at the generator and water storage area by GBPW-210;
- Displacement of recreationists to the surrounding areas during Project operations;
- Impacts on the recreation setting and experience due to the visual or noise disruption from Project activities; and
- Increased population in the local region which may increase demand for recreational opportunities.

4.14.2.2 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments for recreation resources includes the approximately 154 acres of pits, ponds, roads and stormwater diversion channels that would remain as post reclamation features. Irretrievable commitments of recreation resources include access restrictions and displacement of recreationists to surrounding areas, the loss of approximately 946 acres of land for recreation activities during mining operations, and access restriction on 127 acres within the fenced area of the Project. Following reclamation, recreational use of the area is anticipated to return to near existing conditions.

4.14.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The impacts discussed above would largely be short-term, lasting during the seven years of Project operations (i.e., five years of active mining and leaching and two years of residual heap leaching), or at the most until Project closure is completed, which is anticipated to be approximately six years following cessation of mining and residual heap leaching. Long-term impacts would include those visual impacts to recreation resources resulting from the time required for vegetation to re-establish after reclamation. Permanent impacts would consist of the unreclaimed portions of the Project.

4.14.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. The 40-foot permanent

power line ROW would encompass approximately 138 acres of public land administered by the BLM, and approximately six acres of private land. However, approximately 14 acres of the ROW on public land would not be disturbed because it would be outside of the cultural survey clearance area. In addition, approximately 23 acres of the distribution line ROW on public land would be within the existing Mount Wheeler ROW for the Atlas 25 kV overhead distribution line (NVN-047781), and the existing Atlas 25 kV overhead distribution line would be utilized in this area.

This alternative would result in additional impacts to 124 acres of public land that may be used for dispersed recreation for the life of the power line, and approximately six acres of private land. However, the majority of the distribution line would be within and existing powerline corridor (i.e., the Falcon to Gonder Corridor or the Atlas 25 kV corridor), or would follow an existing road (i.e., North Roberts Creek Road), and these impacts would be temporary. Impacts to recreation resources from this alternative would be temporary, regional (as they would occur outside of the Project area) and negligible because the alternative would follow existing roads or power line corridors, and recreation within the ROW area would return after construction of the power line is completed, which is estimated to be six months. This alternative would not result in an increase in recreation use of the surrounding area, above what is described for the Proposed Action. The alternative would not change the Middle Country to Front Country recreational setting of the area of analysis for the alternative, and the recreation setting already includes roads and power lines (BLM, 201b).

The center line travel road proposed to access the power line may create an additional road that may be used by off-highway vehicles (OHV). However, because there are already numerous roads within and adjacent to the proposed ROW, including a center line travel road following the Falcon to Gonder 345 kV transmission line, impacts from the additional center line road on recreational use would be long-term (lasting until vegetation is re-established after reclamation), regional, but negligible.

The proposed distribution line crosses the Pony Express Trail in several locations. This may result in potential access impacts along the trail during construction of the power line. However, these impacts would be temporary, regional, and are anticipated to be negligible.

4.14.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts on recreation resources would be the same as the Proposed Action, but would also include:

- Temporary impacts to 124 acres of public land that may be used for dispersed recreation; and
- Construction of an additional center line travel road that may be used for OHV use.

4.14.3.2 Irreversible and Irretrievable Commitments of Resources

Irretrievable commitments of recreation resources include the temporary impacts to the 124 acres during construction of the distribution line. The distribution line would be fully reclaimed after closure of the Project so no additional irreversible commitment of recreation resources would occur under this alternative.

4.14.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The impacts discussed above would largely be temporary, lasting during the six months of construction.

4.14.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells.

4.14.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be the same as described for the Proposed Action.

4.14.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action.

4.14.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.14.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access.

4.14.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would be the same as described for the Proposed Action.

4.14.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action.

4.14.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.14.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action), which would remain as an existing long-term, minor impact to recreation uses and the recreation setting. The types and levels of dispersed recreation would remain the same as existing conditions. The BLM-administered lands within the Project area would remain available for dispersed recreation. This alternative would have a long-term (due to the unreclaimed disturbances), localized, minor impact on recreation activities.

4.15 Social and Economic Values

4.15.1 Indicators

Primary issues related to social and economic values include: (1) effects associated with potential changes in long-term local population, employment, or earnings associated with development or operation of the Project; (2) potential Project-related demands for housing and public services or infrastructure that would exceed capacities in these systems; (3) potential Project-related effects on public sector fiscal conditions regarding demand for services compared to revenue generated; and (4) potential effects of this alternative relative to local work force and employment conditions.

The Proposed Action, or one or more of the alternatives, would be considered to have a significant effect on social and economic values if:

- There was a Project-related long-term change in any sector of the local economy, such as major change in employment, output, or population diversity;
- The Project resulted in a change in population that would exceed the capacity of affected communities to provide housing and services or otherwise adapt to growth- related social and economic changes;
- The Project's effects on public sector revenues and/or expenditures would likely compromise the ability of local governments to maintain public services and facilities at established service levels; or

- Long-term, Project induced demands on public services and infrastructure would consume available capacities in those systems, either triggering the need for capital expansion or resulting in discernible reductions in levels of services provided;

Changes generated in the social or business communities would likely cause important changes in organizational structures, local government, or lifestyles of the community.

Effect Context for Social and Economic Values
Localized: Effects would occur at a small scale, such as within one community.

Regional: Effects would occur across several communities or impact all of Eureka County.

Duration of Effects Definitions for Social and Economic Values
Temporary: Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Intensity of Effects Definitions for Social and Economic Values
Negligible: There would be a very small effect on the local and regional economy, local population, government revenues and/or expenditures, and demands on public services and infrastructure. The consequences of the action would have no measurable effect on the socioeconomic environment.

Minor: There would be a small but noticeable impact on the local economy, population, government revenues and/or expenditures, and demands on public services and infrastructure, but there would be no significant effect on the regional socioeconomic environment.

Moderate: There would be a measurable impact on the local and regional economy, population, government revenues and/or expenditures, and demands on public services and infrastructure. Adverse and beneficial impacts would not prove significant enough to result in long-term impacts to the socioeconomic environment within the area of analysis.

Major: There would be a significant impact on the local and regional economy, population, government revenues and/or expenditures, and demands on public services and infrastructure. Impacts would reverberate throughout the socioeconomic environment, significantly altering existing conditions, in beneficial or adverse ways.

4.15.2 Direct and Indirect Impacts of the Proposed Action

The area of analysis for potential social and economic effects of the Project is noted in Section 3.15.1. Economic effects of the Project were estimated utilizing indirect and induced multiplier effects developed for Nevada mining activities (**Table 4.15-1**). The social and economic

characteristics of the affected area were analyzed to determine the potential effects of the Proposed Action and the alternatives on employment, population, income, housing, and services. Fiscal impacts were estimated using Project information provided by MMI. Economic effects were quantified when possible; unquantified economic and fiscal effects, as well as social effects were addressed qualitatively and addressed through discussion of likely effects and possible issues.

This analysis estimated the total economic effects (direct, indirect, and induced) from development and operation of the Proposed Action and alternatives. Direct effects comprise initial investment or spending in equipment, labor, materials, services, and supplies obtained for the Project. Indirect effects are the changes in inter-industry purchases and sales of goods and services as they respond to new demands of directly affected industries. Induced effects typically reflect changes in spending from households as income increases or decreases due to changes in production.

Under the Proposed Action, most of the construction of Project is expected to occur in late 2017. Construction employment would include an estimated 100 workers committed to mine construction and approximately 15 general and administrative workers by the end of the construction year. Mine operations would begin ramping up during 2017 and would be assumed to reach the full complement of approximately 120 workers near the beginning of 2018. Because pre-stripping and mine preparation activities are similar in many respects to mining activities, it is expected that the shift from construction to operations would be a gradual process and there would not be a precipitous change in employees. Instead, there would be some overlap of construction and operations workers, especially during late 2017 or early 2018 as construction phases down and operations take over. It is anticipated that the maximum combined employment, including MMI employees and contractors, would not exceed 135. As construction is completed on the various Project facilities, employment would gradually transition from a higher percentage of non-local construction workers to a higher percentage of local operations workers. After 2024, operations would taper off and mining would end. Reclamation and closure activities would continue to varying degrees through 2030. From 2023 through the completion of demolition and reclamation of process facilities in approximately 2028, there would be a gradual reduction in the workforce, ending with a very small number of individuals monitoring revegetation progress and groundwater conditions through 2035. Long-term monitoring and fluid management activities may continue beyond that time as long as necessary.

Employment is one of the key driving forces in determining the social and economic effects of a proposed mine. Considering the proximity of the Project to other mining activities, most of which are closed down, never activated, or at least temporarily inactive, it is expected that a relatively large percentage of the required workers would be local hires, somewhat more so for operations than for construction.

Income and Employment

Construction

As noted, construction activities would require employment of approximately 100 primarily contractor workers for up to one year at the outset of Project development, plus 15 general and

administrative staff (**Table 4.15-1**). Given the nature of construction, it is expected that the number of workers on site would vary somewhat over the construction period. Considering the relatively short construction schedule and that many of the workers would be contractors, moving in and out of the area as their particular skills were needed, it is likely that the indirect and induced employment generated by the construction activity would be minor. There were approximately 509 unemployed individuals in Eureka, Lander, and White Pine Counties in December, 2015, more than five times the number of workers needed for the Project, although it isn't known how many of them would have the requisite skills to qualify for the available jobs. Consequently, it is assumed that many of the needed construction workers may come from outside of the three-county area. If needed, there were an additional 1,363 unemployed in Elko County in December (NDETR, 2016). In contrast, the short duration of construction suggests that most of the small number of secondary job opportunities generated by Project construction would be filled by individuals already residing in the vicinity. The anticipated employment impact during construction would represent approximately 0.9 percent of total employment in the three-county area and an employment increase of approximately 1.6 percent in the natural resources and mining sector in the three counties.

Operations

Operation of the Project would begin in late 2017 or early 2018 and would ramp up to an anticipated full operational employment level of approximately 135 workers at that time or soon afterwards (**Table 4.15-2**). Operations employment would sustain this level on average through 2023, after which the workforce would gradually decline through approximately 2029 as WRDAs, the heap leach facility and process facilities reach the end of their active lives and are reclaimed. A small contingent of workers would continue through approximately 2032, or beyond, for monitoring of revegetation progress and groundwater quality. With the exception of a three-person contract blasting crew, operations workers would be Project staff. The approximately seven-year operating life of the Project (including construction pre-stripping and the additional two years for leaching operations) would likely result in a majority of the operations' workers seeking residence in the Project vicinity with most of them locating in or near Eureka primarily because of proximity to the Project site. The longer employment period associated with operations would generate indirect and induced employment estimated at approximately 101 jobs.

Table 4.15-1 Proposed Action – New Construction-Related Employment, Households, and Population Projections (2017)[1]

New Construction-Related Employment								
Direct[2]			Indirect and Induced[3]			Total		
Local	Non-Local	Total	Local	Non-Local	Total	Local	Non-Local	Total
46	69	115	18	5	23	64	74	138

New Construction-Related Households			
	Direct[4]	Indirect & Induced[5]	Total New Households
New Non-Local Workers	69	5	NA
Single	62	2	64
Married - 1 Worker	6	2	8
Married - 2 Worker	1	1	2
New Households	**69**	**5**	**74**

New Construction-Related Population					
	Households	Population[6]			
		Adults	Children[7]		Total
			School-Age	Other	
Single Households	64	64	0	0	64
Married Households	10	20	9	2	31
Total	**74**	**84**	**9**	**2**	**95**

[1] All multipliers were derived from Dobra 1988 and 1989.
[2] Work force was assumed to be 40 percent local, 60 percent non-local.
[3] Indirect and induced employment was calculated using an employment multiplier of 1.20; the indirect and induced work force was assumed to be 80 percent local and 20 percent non-local.
[4] Direct work force was assumed to be 90 percent single or married without families present; 10 percent of married worker households were assumed to be two-worker families.
[5] Indirect and induced work force was assumed to be 30 percent single or married without families present; half of married worker households were assumed to be two-worker families.
[6] Population estimates were based on one person per single household and 3.07 persons per married household.
[7] Eighty percent of children were assumed to be of school age.

Unlike construction, it is expected that most of the mine operations workers would come from within the local area of analysis, while a high percentage of secondary job opportunities would be filled by individuals already residing in the area (**Table 4.15-2).**

Table 4.15-2 Proposed Action Operations-Related Employment, Households, and Population Projections (2018-2024 Average)[1]

New Operations-Related Employment								
Direct[2]			Indirect and Induced[3]			Total		
Local	Non-Local	Total	Local	Non-Local	Total	Local	Non-Local	Total
95	41	135	81	20	101	176	61	236

New Operations-Related Households			
	Direct[4]	Indirect & Induced[5]	Total New Households
New Non-Local Workers	41	20	NA
Single	10	5	15
Married - 1 Worker	28	8	36
Married - 2 Workers	2	4	6
New Households	40	17	57

New Operations-Related Population					
	Households	Population[6]			
		Adults	Children[7]		Total
			School-Age	Other	
Single Households	15	15	0	0	15
Married Households	40	80	34	9	123
Total	**55**	**95**	**34**	**9**	**138**

[1] All multipliers were derived from Dobra 1988 and 1989.
[2] Work force was assumed to be 70 percent local, 30 percent non-local.
[3] Indirect employment was calculated using an employment multiplier of 1.30; induced employment was calculated using a multiplier of 1.45; (Dobra 1988, 1989) the indirect and induced work force was assumed to be 80 percent local and 20 percent non-local.
[4] Direct work force was assumed to be 25 percent single or married without families present; 10 percent of married worker households were assumed to be two-worker families.
[5] Indirect and induced work force was assumed to be 25 percent single or married without families present; half of married worker households were assumed to be two-worker families.
[6] Population estimates were based on one person per single household and 3.07 persons per married household.
[7] Eighty percent of children were assumed to be of school age.

Because there are approximately 556 unemployed workers in the analysis area, and because other local mining projects have been closed or put on hiatus in recent years, it is assumed that many of the operations workers needed for the Project would be available locally. MMI has indicated that it intends to hire locally and that the recent closing of the Ruby Hill Project supports this plan. Some local workers displaced from Ruby Hill and other local mining projects may have taken employment elsewhere, although if they have property in the vicinity, they would likely return to the area or end weekly commuting to other projects. The calculations in **Table 4.15-2** assume local workers would fill approximately 70 percent of direct Project jobs and 80 percent of the indirect jobs during operation of the Project. As many as 41 direct and 20 indirect and induced workers from outside the local area would be needed. The total of 135 additional jobs for operations, plus 101 indirect and indirect in the community, would represent a 1.9 percent increase over total 2015 employment in Eureka, Lander, and White Pine Counties. If the noted

assumptions about local versus non-local hiring hold true, the effect on the unemployment rates for the two counties would be regional, short-term, and minor.

The estimated average annual payroll for the Project, including both salaried and hourly workers combined, would be approximately $11.7 million, including benefits. The payroll would decline with the reduction in work force after 2023. Each $1.00 in direct earnings would indirectly generate $0.37 in earnings to other workers in the local economy (U.S. Bureau of Economic Analysis, 1992; Dobra, 1989; Price and Harris, 2007). Consequently, the annual indirect earnings effect would add an additional $4.3 million and the total combined wages and benefits during the seven- to 10-year primary operations period would be approximately $16.0 million annually. The increase in income earnings would be a short-term, regional, moderate economic benefit accruing to the local economy of the three-county analysis area.

Housing

Construction

Assuming many construction workers would be non-local, they would not affect the permanent housing market to any substantial degree. They would, however, place a substantial demand on local temporary housing resources in Eureka and surrounding communities. Assuming approximately 74 temporary housing units would be needed; they would represent approximately 66 percent of the total number of motel rooms and RV sites in the Eureka area. This level of demand could result in competition for temporary housing, particularly during high tourism seasons.

Operations

Operations would generate demand for an estimated 57 housing units for the seven-year duration of maximum operations workforce for the Project (**Table 4.15-2**). At the time of the 2010 census, there were nearly 147 vacant housing units in the area of analysis (**Table 3.15-4**). Comparable data for current vacancy rates are not available, however, the recent closure of the Ruby Hill mine project and local observations (Mears, 2016) would suggest there would be more than enough housing available to accommodate the Project-related demand. The vacancies were not uniform across the housing stock, however. Vacancy rates in the owner-occupied housing market were in the 2.6 percent range, which indicates a tight market with little flexibility for purchasers. In contrast, vacancy rates in the rental housing stock were much higher at about 21 percent in 2010. Although the rental vacancy rate may be overstated, the vacancy in all types of units in the Eureka vicinity should be sufficient to accommodate the expected Project-related demand.

Community Facilities and Services

No significant capacity or service issues have been identified for most public facilities and services in the southern Eureka County area. In addition, the existing local population has declined by over 30 percent between 2010 and 2014, falling below the level in 2000. Consequently, the relatively small number of new people that would be anticipated for construction and operation of the Project would not be expected to adversely affect most public services in the area. A possible concern is the lack of a hospital nearby, requiring transport of any serious cases to Ely, Elko, or Reno. Emergency medical technician and air and ground ambulance services are still available locally,

but higher level emergency care in the event of an accident or serious illness is more than an hour away from the area of analysis.

Education

School enrollment would increase by an estimated nine students during the construction year and approximately 34 students under the operations population growth estimate for the Project. Most of the new students would likely locate in Eureka. Considering that enrollment in Eureka schools has declined since 2012 to 2013 by approximately 24 students, and that enrollment topped 350 students as recently as the 1990s, it is expected that the effects of the Project-related increase would be minor and should not adversely affect district schools.

Public Finance

The Project would generate public revenues from sales and use taxes, net proceeds of mines taxes, *ad valorem* property taxes, and from business taxes. The estimates presented in this analysis are based on information provided by MMI prior to Project development. As such, they are subject to change as the Project proceeds and commodity prices fluctuate. The estimates are believed to be a reasonable assessment of the tax revenues that would flow from the Project.

MMI estimates Project capital expenditures would be approximately $47.8 million for plant equipment, material, and construction equipment, plus approximately $13.0 million by a contractor for heap leach construction work. Local purchasing (Nevada) would be prioritized and Nevada sales taxes would be collected in the jurisdiction where purchases were made and would be distributed among the state, the school district(s), the county, and the counties' revenue sharing pool. Because Eureka County doesn't have major sources of mining equipment and supplies, it is uncertain how much of the sales and use tax would accrue to the county. The total sales tax generated, however, based on Nevada's minimum rate of 6.85 percent, would be $3.3 million for direct Project capital expenditures plus $0.9 million for heap leach contractor capital expenditures. This is a high estimate since it is not feasible for all capital expenditures to occur within Nevada due to the global nature of the mine equipment market. School districts are significant beneficiaries of sales and use taxes, receiving approximately 38 percent of the proceeds. The local county's share of sales taxes is relatively modest at approximately seven percent of the revenue.

Net proceeds taxes and *ad valorem* property taxes would be a more substantial contributor to Eureka County, which would be the primary beneficiary of these revenues. Net proceeds of mines are categorized and taxed similar to real property. In general terms, net proceeds taxes are assessed on the value of production minus the costs of production. MMI estimates property taxes from the Project would be approximately $88,000 over the life of the mine. Net proceeds taxes from the Project are estimated at $5.6 million over the life of the mine, although the payments may vary from year to year. With reference to **Table 3.15-6,** however**,** the combination of property taxes and net proceeds taxes from the Project would have a notable positive impact on Eureka County revenues, averaging nearly five percent of the county's 2015 through 2016 revenue estimate.

In addition to the public revenues derived from the Project itself, salaries and benefits to workers would contribute to the local economy and to local public revenues. MMI estimates labor costs – including salaries and benefits – would average approximately $11.7 million annually. Because a substantial proportion of construction workers in the first year would be non-local, a smaller portion of the economic activity generated by these payments would accrue to the local area. During Project operations, much of the activity would accrue locally. Since most of the operations workers would be expected to take residence in the Eureka area for the life of the Project, a substantial portion of the annual labor payments would contribute to the local economy.

In summary, construction of the mine would have a short-term, localized, moderate, positive short-term fiscal effect on the entities within the study area, and operation and maintenance of the mine would have a long-term, minor positive fiscal effect for the life of the Project. These effects would effectively cease at the time the Project is completed and reclaimed.

4.15.2.1 Unavoidable Adverse Impacts

During the construction phase, there would be a temporary influx of construction workers, which would create a demand for temporary housing that may conflict with tourist and recreational needs for the same housing. These effects would be temporary and moderate. Any effects caused by an increase in population during construction would likely subside once the construction is complete and operations workers settle in to more permanent situations. These effects would be localized, minor and temporary.

No significant capacity or service issues have been identified for population-driven demand for public facilities or services in the analysis area during Project operations. Minor increases in population-driven demand for public facilities and services would not be expected to adversely affect existing facility and service capacities.

4.15.2.2 Irreversible and Irretrievable Commitments of Resources

Under the Proposed Action, the social and economic structure of Eureka County would not be substantially altered. Economic resources committed to the Project would be irreversible and/or irretrievable; expended in return for the benefits derived from the Project.

4.15.2.3 Relationship of Short-Term Uses and Long-Term Productivity

A minor amount of socioeconomic resources would be affected during the life of the Project, but in the long-term, impacts to the productivity of socioeconomic resources would be short-term, localized, and negligible.

4.15.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Construction of a 25 kV distribution line in lieu of a full complement of on-site LNG generators would require employment of approximately six to 10 contract workers for a period of up to six months.

Income and Employment

The 25 kV distribution line would be built by a contractor from elsewhere in Nevada, overseen by Mt. Wheeler Power the electric utility serving southern Eureka County (Murdock, 2016). Construction of the distribution line would generate an additional estimated $200,000 to $350,000 in wages and salaries, including benefits. In return, it is assumed that fewer on-site generators would be required, although a certain amount of back-up power generation would likely be still needed.

During operations, there would be minimal maintenance required to support the distribution line. Any such work would be done by existing staff of Mt. Wheeler and would not be expected to affect employment or income.

Housing

Construction of the distribution line alternative would require temporary housing for the small construction workforce. This would add a small increment to the demand for temporary housing for the six-month construction period, which would be a localized, negligible impact.

There would be no additional housing needed for this alternative after completion of construction.

Community Facilities and Services

The small construction workforce for the distribution line would constitute a very small increment in demand for community facilities and services for the brief construction period. The effects would be localized, temporary, and negligible.

Education

Because of the short construction schedule, which is anticipated to last six months, it is unlikely that any of the construction workers, estimated at six to 10 contract workers, would move family members to the community. Consequently, there would be no effect on education facilities.

Public Finance

Effects of this alternative on public financial resources would be minimal. There would be an uncertain, but relatively small, reduction in sales tax from purchasing fewer on-site generators, which would be offset to some degree by materials and supplies required for the distribution line. There would be a localized, temporary, negligible increase in local purchases by construction workers living temporarily in the southern Eureka County community.

In summary, construction of this alternative would have a localized, temporary, minor, positive fiscal effect on the entities within the area of analysis. Over its operational life, this alternative would result in reduced capital expenditures and sales tax revenue associated with the initial capital costs associated with construction of the distribution line. Capital costs associated with the construction of the 25 kV distribution line are estimated at $3.3 million. It is estimated that the LNG powered generators would result in approximately $4.2 million in initial capital costs. This alternative would reduce the overall initial capital costs for construction of the necessary power supply for the Project by approximately $960,000. The reduction in capital costs associated with

construction of the distribution line would also reduce sales tax revenue. Assuming all capital expenditures for the distribution line construction occur in Nevada, which is a high estimate, the total sales tax generated based on Nevada's minimum rate of 6.85 percent, would be $226,000. The use of LNG generators on sites is estimated to generate approximately $287,700 in sales tax revenue from initial capital cost expenditures. This alternative is anticipated to reduce sales tax revenues from initial capital cost expenditures associated with construction of the power supply to the mine by approximately $61,700. However, purchases of equipment for construction of the distribution line would likely come from outside of the analysis area. In this respect, the local community would see little sales tax revenue generated from sales of construction supplies and equipment.

This alternative would also reduce operating costs for the power supply, in part due to the reduction of fuel needed to power the generators. The fixed charge rate for the distribution line would be $818,000 annual cost over the life-of-the mine, whereas the fixed cost for the LNG generators is estimated at approximately $1,058,000 annual cost over the life-of-mine, which would be a reduction of approximately $240,000 in annual operating cost over the life-of-mine under this alternative.

4.15.3.1 Unavoidable Adverse Impacts

During construction of the distribution line, there would be a temporary influx of construction workers, which would create a very small incremental increase in demand for temporary housing that may add to the conflict with tourist and recreational needs for the same housing. These effects would be temporary and negligible.

4.15.3.2 Irreversible and Irretrievable Commitments of Resources

Under this alternative, the social and economic structure of Eureka County would not be substantially altered. Labor resources committed to the Project would be irreversible and/or irretrievable, but other committed economic resources would be reversible or retrievable.

4.15.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Socioeconomic resources, including labor and capital invested in developing and operating the mine, would be affected during the life of the Project, but in the long-term, impacts to the productivity of socioeconomic resources would be negligible.

4.15.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production

wells. Implementation of this alternative would have the same social and economic effects as the Proposed Action.

4.15.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts for this alternative would be the same as described for the Proposed Action.

4.15.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources for this alternative would be the same as described for the Proposed Action.

4.15.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term use and long-term productivity for this alternative would be the same as described for the Proposed Action.

4.15.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. Implementation of this alternative would have the same social and economic effects as the Proposed Action.

4.15.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts for this alternative would be the same as described for the Proposed Action.

4.15.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources for this alternative would be the same as described for the Proposed Action.

4.15.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term use and long-term productivity for this alternative would be the same as described for the Proposed Action.

4.15.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not be developed and associated effects on social and economic values in the area would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. Under this alternative, the number of employees would continue at existing low

levels and impacts to social and economic values is expected to be short-term, localized, and negligible.

4.16 Soils

This section describes the environmental consequences for consideration of direct and indirect effects to soils. The direct and indirect analysis includes soil resources found within the Plan boundary.

4.16.1 Indicators

Soil types were qualitatively assessed relative to anticipated effects of proposed surface disturbance acres, underground exploration, and reclamation activities. Adverse effects would include soil removal, soil loss due to erosion by wind and water, profile mixing, compaction, contamination, and loss of productivity.

Effect Context for Soils

Localized: Effects would occur inside the Project area.

Regional: Effects would occur outside of the area of analysis to the larger region.

Temporary: Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.

Duration of Effects Definitions for Soils

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last longer than the duration of the Project.

Permanent: Effects to soil quality and productivity would be permanent.

Intensity of Effects Definitions for Soils

Negligible: Effects to soils would be so slight as to not be measurable.

Minor: Effects to soils may occur, and would be detectable, but small and of little consequence to soil quality and productivity. Impacts would occur within the Project area. Effects would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project.

Moderate: Effects to soils would occur and would be measurable and would occur over a larger area. Impacts to soil quality and productivity may occur. However, impacts would still likely occur within the Project area. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary, but these measures would most likely be effective.

Major: Effects on soils would occur both within and outside of the Project area and would be measurable and apparent. Impacts to soil quality and productivity would likely occur within and outside of the Project area. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary, and these measures would need to be monitored to determine their effectiveness.

4.16.2 Direct and Indirect Impacts of the Proposed Action

The Proposed Action would have direct and indirect impacts to the soil resources within the Plan boundary. Changes may include structural, physical, and chemical alterations that could result in the potential for decreased soil function leading to the poor quality of the topsoil, the potential for increase in wind or water erosion, and the potential contamination of soils from spills or leaks of chemicals associated with mining operations. Potential indirect effects to soils resources may include off-site dust generation, as well as off-site wind or water based erosion. A number of EPMs have been proposed to minimize impacts to soils (Section 2.2.20). The following outlines the impacts to soils from the Proposed Action.

Soil disturbance is proposed for 1,129 acres within the Plan boundary (including exploration activities), of which 395 acres have been previously disturbed. MMI is currently authorized for 16 acres of disturbance for exploration activities under authorized NOIs. New disturbance to undisturbed soils would include approximately 718 acres of long-term disturbance with implementation of the Project. Approximately 154 acres would not be reclaimed after the Project ceases operation. Soils within the Plan boundary are not listed as prime or important farmlands by the NRCS.

Approximately 1,000 acres are to be reclaimed, which includes the approximately 25 acres existing non-MMI disturbance that MMI has committed to reclaiming. The majority of impacts to soils would be long-term and localized. Un-reclaimed areas would be considered permanent, localized soil disturbance, would include the pits, process ponds, some roads, and storm water diversion channels for a total of approximately 154 acres (**Table 2.2-16**). **Table 4.16-1** depicts the soils impacted through implementation of the Project.

Table 4.16-1 Proposed New Disturbance to Third-Order Soil Map Units

Map Unit Number	Map Unit Name	Acres			Percent of Total Acreage
		BLM	Private	Total[1]	
501*	Hymas-Ansping association	280	<1	280	42
511	Ansping-Hymas association	169	<1	169	25
451*	Foxmount-Haunchee-Rock outcrop association	79	49	128	19
462	Haunchee-Hatur-Rock outcrop association	26	19	45	7
111	Lien-Hayeston association	27	-	27	4
552	Decram-Hapgood-Loncan association	8	<1	8	1
280	Coils loam, 2 to 8 percent slopes	7	1	8	1
701*	Loncan-Gando-Glean association	3	-	3	1

Map Unit Number	Map Unit Name	Acres			Percent of Total Acreage
		BLM	Private	Total[1]	
202	Umil-Hayeston association	1	-	1	<1
770	Welch loam, drained, 0 to 4 percent slopes*	<1	-	<1	<1
Total		**600**	**69**	**669**	**100**

[1.] The above total disturbance calculation does not include the approximately 49 acres of proposed new exploration disturbance, because exploration activities may occur on any of these soil types within the Plan boundary.
* Soils listed fair for reclamation by the NRCS. Does not include those impacted from the water pipeline and road.

Five soils within the Project boundary are listed as fair by NRCS (**Table 3.16-3**), making them available as use for growth media. Three of these soils would be disturbed during Project implementation. Approximately 411 acres of these soils would be stockpiled for later use (**Table 4.16-1**). Soil disturbance to soils listed as fair for reclamation (**Table 3.16-3**) for placement of the water pipeline and access road are not included, as these soils would be utilized for backfilling the trench and revegetation subsequent to construction (Soils Unit Numbers 280 and 770). Hymas-Ansping, Foxmount-Haunchee-Rock Outcrop, and Locan-Gando-Glean associations are rated as fair sources for reclamation material (NRCS, 2015). Fair soils are soils that would require additional amendments, or other practices to increase their suitability for successful growth media. Because concerns regarding the amount of available growth media, and the suitability of such soils, MMI contracted with SRK Consulting and Cedar Creek Associates (SRK, 2013a and 2013c; Cedar Creek, 2016) to assist with developing engineering and biological approaches to facilitate suitable and successful reclamation for the Project. Topsoil, alluvium, and geologic material within the Project boundary have been evaluated and spatially identified and characterized adequate volumes of topsoil and various alternate growth media for reclamation. Opportunities for growth media salvage are prioritized by the reclamation goals presented in the "Conceptual Reclamation/Revegetation Plans for the Gold Bar Project Waste Rock Dumps" (Cedar Creek, 2016). Material are grouped based on physical and chemical properties that would best accommodate final landform design and post mining land use. As such, Tier 1 materials would comprise of topsoil and alluvium, and target flatter sloped reclamation. Tier 2 materials would target steeper sloped reclamation, comprised of alluvium, weathered waste rock and stockpiled materials, and easily weathered geologic units (Cedar Creek, 2017a).

Disturbed soils are more susceptible to erosion by wind and water. Steep slopes are inherently at a higher risk of water erosion. Erosion potential from water and wind ranges from slight to severe throughout the Project (**Table 3.16-3**). EPMs listed in Section 2.2.20, and the reclamation techniques discussed in the "Conceptual Reclamation/Revegetation Plans for the Gold Bar Project Waste Rock Dumps" (Cedar Creek, 2016), would reduce this erosional risk from stockpiles and WRDAs. Exposed soils, including existing disturbance, are susceptible to erosion from wind and water. However, successful concurrent reclamation would reduce the amount of area exposed to the weather, and thus reduce the erosion potential of Project disturbance.

The water supply pipeline would largely be placed within existing disturbance. However, portions of the pipeline instillation would impact undisturbed soils as the pipeline is constructed to the two water supply wells on private land. Additionally, North Roberts Creek Road would be widened to allow for construction and all weather access to the Project area. However, multiple disturbances may reduce the soil aggregate stability and fertility by mixing the soil profile during the excavation required for the pipeline installation. Once installed, the pipeline outside of North Roberts Creek Road would be seeded and reclaimed, reducing erosion potential and increasing soil fertility with plant root growth.

Use of the parking lot in the town of Eureka would have negligible impacts on soil resources since it has already been disturbed and improved. The lot has been surfaced with compacted gravel for an all-weather surface. This has buried the two soil types within this lot, described in Section 3.16. However, surfacing the lot with compacted gravel has potentially reduce erosion of these two soil types, which are both classified as moderate erosion potential (**Table 3.16-2**).

Soil Quality

Surface disturbance to soils affects their function. These impacts may occur from removal, stockpiling, and placement of soil for growth media and may result in direct, localized, long-term impacts to soils, which include physical and chemical changes. These changes would be caused by mixing, crushing, and compaction during salvage operations for the growth media stockpiles. Soil types with high amounts of coarse fragments would reduce risk of compaction to underlying soils by providing structural support for heavy equipment. Physical effects of compaction on the soils include reduced permeability and porosity, damage to biological soil crusts, decreased available water holding capacity, increased bulk density, and loss of soil aggregate structure. Surface soil aggregates are the most susceptible to damage, and if damaged can create a surface crust when wetted, essentially sealing the soil surface and increasing the risk of soil erosion and impeding seedling growth during reclamation. If needed, synthetic soil conditioners can be applied, which simulate the aggregation of natural polymers created by microbial decay of organic matter and would increase soil aggregation and aggregate stability.

Biological soil crusts are a complex of cyanobacteria, green algae, lichens, moss, microfungi, and other bacteria (Belnap et al., 2001). These crusts are multifunctional and act as soil moisture retaining mulch, discourage annual weed growth, reduce wind and water erosion, fix carbon and atmospheric nitrogen, and contribute to soil organic matter (Belnap et al., 2001). It is likely that some degree of biological soil crusts occur in the Project area, as they are common across the desert southwest and Northern Great Basin, but it was not noted as an important ecosystem characteristic during soil and vegetation field surveys completed by Cedar Creek in 2016 (Cedar Creek, 2017b). If functioning biological crusts do exist, they are likely limited in areal extent due to various land use activities. Therefore, biological soil crusts are likely a minor component affecting local hydrology, geomorphology, nutrient cycling, and vegetation composition/structure. Disturbance to biological soil crusts from crushing and mechanical damage would occur during salvage operations. Biological soil crust components vary in their recovery time, which is also influenced by site specifics. Estimates for recovery times in the Northern Great Basin range from

20 to 125 years, or greater, for various species (Belnap et al., 2001), and would depend on post-disturbance soil structure, precipitation, soil chemistry, etc.

Mining and construction activities would impact the productivity and fertility of newly disturbed (669 acres) soils by mixing and compaction of the soils during salvage operations. Soil productivity is an interrelation between soil organic matter, infiltration, aggregation, pH, microbial biomass, bulk density, forms of nitrogen, topsoil depth, salinity, and nutrient supply (Havlin et al., 2005). Microorganisms (e.g., nemadotes, bacteria, and fungi) are an important component of the soil matrix and are a critical component for nutrient cycling. A reduction in soil productivity or fertility indirectly effects vegetation growth and thus the success of reclamation efforts.

Growth medium is defined in NAC 519A.040 as a material which is capable of supporting vegetation. Growth media that is practicably salvageable would be removed prior to facility construction (MMI, 2016a). Growth media would be used for reclamation of the WRDAs and the HLP. Soil salvage for growth media is an important factor for successful revegetation in reclamation areas. The growth media balance shows an estimated surplus of available growth media, with approximately 64,981,046 cubic feet available with a projected total stockpile volume of 62,881,225. Approximately 52,401,021 cubic feet are estimated to be required for coverage as growth media (**Table 2.2-15**). The Project facilities requiring growth media are the HLP and waste rock facilities. Additionally, mixing of soil types during salvage operations would dilute excessive coarse fragment content and distribute organic matter throughout the recovered material, resulting in maximum recovery volumes. However, given the NRCS ratings for sources of reclamation material and topsoil, the salvaged growth media would likely require some soil amendments for successful reclamation.

Soils that are stored for extended periods, such as stockpile sites, would be more affected by compaction, lack of aeration, decreased porosity and permeability, and reduced water-holding capacities. Approximately 411 acres of soils slated for reclamation could be impacted by storage.

Growth media stockpiles would be reseeded after shaping to reduce erosion and maintain biological processes to increase soil productivity. Additionally, BMPs such as straw wattles or staked straw bales would be used as necessary to reduce liberated sediment during precipitation events.

Growth media handling operations would be conducted using dozers, front-end loaders, haul trucks, and other equipment. Growth media would be placed on the tops and slopes of the regraded WRDAs and the top and sideslopes of the regraded HLP, and revegetated as described in Section 2.2.19. Based on current predictions of available growth media, it is anticipated that approximately 12 inches of growth media would be available for placement on the WRDA surfaces, while approximately three feet of growth media would be available for covering the HLP regraded top and sideslopes. MMI has contracted with Cedar Creek to provide potential options for alternative growth media by identifying primary successional material that is of sufficient volume to facilitate placement to a depth of 12 inches or greater, is comprised of the appropriate

textural class to facilitate plant-available water-holding capacity, and is chemically neutral to plant life. These alternate growth media sources are detailed in the Alternate Growth Media Assessment Report (Cedar Creek, 2017a).

Reclamation of the Heap Leach Facility

The HLP would be decommissioned in accordance with NDEP regulations and guidelines for closure. In compliance with NAC 445A.447, a FPPC for the HLP would be prepared and submitted to the NDEP and the BLM two years prior to the anticipated final termination of the HLP operation.

Chemical stabilization of the HLP is required to meet the permanent closure requirements. MMI anticipates that the spent heap would be allowed to drain with no fresh water rinsing. Final details of heap neutralization and closure would be developed at least two years prior to Project closure pursuant to the requirements.

After the HLP solution inventory is sufficiently reduced, the HLP would be regraded, compacted, covered with three feet of growth media, and revegetated. The HLP would be constructed in lifts with benches designed to allow side-slope regrading to 3H:1V slopes without the spent ore being pushed off the containment liner. The side-slopes would be graded to a maximum 3H:1V slope. The regraded heap geometry would approximate the surrounding natural topography and would mitigate visual impacts, provide stability, promote runoff, and reduce infiltration.

Regraded HLP surfaces would then be covered with salvaged growth media. The material would be evenly distributed over the compacted surfaces. The growth media cover would allow for retention of water in the cover material during snow melt and precipitation and support establishment of vegetation. By retaining the water in the soil cover for plant uptake and evapotranspiration, the amount of water infiltrating in the underlying spent ore would be reduced, thus minimizing the draindown solution. The final surface of the HLP cover would be uneven to provide a more suitable environment for plant growth by allowing some water storage on the uneven surfaces and reducing sediment yield (MMI, 2016a).

Reclamation of Open Pits

MMI would close its open pits in a manner that is protective of the public safety. During operations, the existing south pit at Gold Ridge would be backfilled with the waste from the upper benches of the new Gold Ridge north pit. Additionally, MMI may also backfill portions of the Gold Pick pit and Cabin Creek pits (based on the economics of the Project at that time). MMI would request an exemption to the requirement for reclamation of open pits which are not backfilled during operations, and rock faces which are not be feasible to reclaim.

Overall, potential impacts to soil quality from the implementation of the Project would result in direct short-term and long-term localized impacts to soil resources on approximately 1,129 acres within the Plan boundary (not including existing non-MMI disturbance to be reclaimed). Some of these acres of disturbance would be on existing disturbance. Currently 1,000 acres are proposed for reclamation, including the approximately 25 acres of non-MMI disturbance to be reclaimed. These acres are expected to have a long-term, localized, minor impact to soils. Approximately

154 acres of soils impacted by the Proposed Action would not be reclaimed. This unreclaimed area would have a permanent, localized, minor to moderate impact, depending on the progression of soil formation and recovery.

Wind and Water Erosion

The erosion potential of soil is determined by certain characteristics of the soil as well as the angle of the slope. Soil properties identified in **Table 3.16-3**, indicate that a majority of the soil units within the Plan boundary are susceptible to erosion, either wind or water. Increased erosion potential would be localized and moderate in the short-term prior to reclamation and potentially in the long-term, post-restoration. Stockpiled soils would be susceptible to increased water erosion during storm events or snow melt. An increase in wind based erosion would occur primarily during ground disturbance, salvage, and reclamation activities where soil is being moved with heavy equipment. These soils would continue to be susceptible to wind and water erosion until stabilizing vegetation becomes established.

Soil erodibility is estimated by the K factor, which is essentially a reflection of the soils structure. The K factor is soil erodibility factor which represents both susceptibility of soil to erosion and the rate of runoff, as measured under the standard unit plot condition. Factors driving erodibility include particle size, organic matter, structure, and permeability. Soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment (USDA, 2016). Coarse textured soils, such as sandy soils, have low K values, about 0.05 to 0.2, because of low runoff even though these soil particles are easily detached. Medium textured soils, such as the silt loam soils, have moderate K values, about 0.25 to 0.4, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having a high silt content are most erodible of all soils. They are easily detached; tend to crust and produce high rates of runoff. Values of K for these soils tend to be greater than 0.4 (USDA, 2016).

USDA now estimates the K factor by two methods, the Kf, which applies only the fine earth (less than 2.0 mm) fraction, that is free of rock fragments; and the Kw factor that applies to the whole soil, including rock fragments within the soil (USDA, 2016).

Soil structures affect both susceptibility to detachment and infiltration. Permeability of the soil profile affects K because it affects runoff. As these factors pertain to reclamation of mine sites, they are related to infiltration of meteoric water, to erosion both water and wind, the geometry of the resorted sites, to support of reclamation plants via seeding. Organic matter reduces erodibility because it reduces the susceptibility of the soil to detachment, and it increases infiltration, which reduce runoff and thus erosion.

The design configurations of particular WRDAs are critical in reclamation in order to retain the limited growth media, and to enhance vegetation establishment. This also applies to the stockpile sites, so that salvaged soil is retained (Cedar Creek, 2016).

Several EPMs specified in Section 2.2.20, have outlined a number of measures to reduce direct, short-term, and long-term water erosion through BMPs. Section 2.2.20 provide details of the

BMPs that would be used to reduce erosion and soil loss, as well as short-term indirect effects to soils. Indirect impacts may result from wind erosion.

Soil erosion would be localized and moderate in the short-term prior to restoration, and potentially moderate in the long-term, post-reclamation depending on the soil's ability to support reclamation success. The continual use of the Project access roads increases the risk of soil erosion; however, this impact would be considered short-term, localized, and negligible.

Potential Contamination of Soils

Soil resources may be impacted as a result of leaks or accidental spills of contaminants. During the mining process, MMI would employ a number of safeguards through monitoring and response. If spills or leaks occur, MMI would employ controls and cleanup measures in accordance with NDEP guidelines. Therefore, any contamination impacts to soils, should they occur, are anticipated to be short-term, localized, and minor.

The Proposed Action, with implementation of EPMs, would not conflict with BLM regulations for mining reclamation under 43 CFR Part 3800, Eureka County management goals, or State of Nevada laws related to mining and reclamation under NRS 519A.210(3), NAC 519A.255 and State BMPs. However, given the limited availability of growth media, the Project may conflict with NAC 519A.325 which requires sufficient top soil be stockpiled for reclamation. However, the Conceptual Reclamation Plan and the Alternate Growth Media Assessment Report details that MMI would potentially use material that may not be specifically considered topsoil, but that provides appropriate textural class and is chemically neutral to plant life. Use of this secondary successional material would allow for direct placement of a thin layer of the amended growth media to facilitate the emergence of vegetation from seed (Cedar Creek, 2016 and 2017).

Overall, impacts to soils are expected to be long-term, localized, and minor to moderate over the life of the mine and after life of mine.

4.16.2.1 Unavoidable Adverse Impacts

The soils disturbed during mine operations would be unavoidably altered from their natural state. The impacts range from degradation of soil structure, loss of microbiotic crust and function, increased compaction, and the disruption of soil development.

4.16.2.2 Irreversible and Irretrievable Commitments of Resources

Irreversible impacts to soils associated with the Proposed Action are those areas where soils are disturbed or removed. This would result in an irreversible commitment of soil resources. Those soils salvaged for use in reclamation would have alterations to their functions in the near and long term until they are able to support vegetation and have some soil function return. Loss of soil functions would diminish over time as soil development process resumes. Irreversible commitment of resources could occur because the soils within the Great Basin take hundreds of years to develop, once soils are disturbed, they would require as long to recover to their initial pre-Project capacity.

4.16.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Use of the Project site for mining activities in the short term would reduce the long-term productivity of the soils affected by the operations. Replacement and revegetation of these soils during reclamation activities would reduce this impact but not eliminate it.

4.16.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. Potential impacts associated with this alternative would occur during construction (temporary impacts), and through the life of the operation of the 25 kV distribution line (short-term). Temporary impacts to soils would occur within the 80-foot working ROW during construction, while the longer-term impacts would occur within the 40-foot ROW where the existing poles and maintenance road would remain. Soils would be disturbed during overland movement, construction of the center line travel road, or where soils would be bladed or removed during construction. All disturbed soils would have an increased potential for wind or water based erosion, and would result in degradation of soil function (e.g., water holding capacity, plant support). Soils may be stockpiled during construction so that they may be used in reclamation activities. **Table 4.16-2** depicts the soils within the 40-foot ROW since these are the areas that would be impacted in the longer-term. Approximately 130 acres of soils would have direct, short-term, regional, moderate impacts, but after reclamation of the working ROW these impacts are expected to be short-term and minor as the ROW soils establish vegetated cover.

Table 4.16-2 Third-Order Soil Map Units within the 25 kV Overhead Distribution Line Right-of-Way

Map Unit Number	Map Unit Name	Acres		
		40-foot ROW		
		BLM	Private	Total
601	Rubyhill-Barrier association	46	-	46
600	Rubyhill sandy loam, 0 to 4 percent slopes	15	-	15
BA	Bartine-Overland association	12	-	12
RHC	Rubyhill fine sandy loam, 2 to 8 percent slopes	9	-	9
202	Umil-Hayeston association	6	0	6
280	Coils loam, 2 to 8 percent slopes	6	1	7
US	Umil association	6	-	6
141	Pedoli-Poorcal association	5	-	5
111	Lien-Hayeston association	4	-	4
KbA	Kobeh sandy loam, 0 to 2 percent slopes	3	-	3
DO	Dianev silty clay loam	1	-	1
201	Umil loam, 2 to 8 percent slopes	2	<1	<3
511	Ansping-Hymas association	2	-	2
590	Hayeston sandy loam, 0 to 4 percent slopes	2	-	2
370	Kobeh gravelly loam, 0 to 2 percent slopes	2	-	2

Map Unit Number	Map Unit Name	Acres		
		40-foot ROW		
		BLM	Private	Total
KHB	Kobeh gravelly fine sandy loam, 2 to 4 percent slopes	1	-	1
270	Poorcal loam, 0 to 4 percent slopes	1	1	2
661	Akerue-Simpark-Robson association	1	-	1
NdB	Nayped loam, 2 to 4 percent slopes	1	-	1
SfB	Shipley fine sandy loam, 2 to 4 percent slopes	1	1	2
ShA	Shipley silt loam, 0 to 2 percent slopes	<1	1	<2
Sn	Shipley complex	1	<1	<2
770	Welch loam, drained, 0 to 4 percent slopes	-	2	2
Ab	Alhambra fine sandy loam	-	1	1
Total				**130**

4.16.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts to soils caused by this alternative would be the same as for the Proposed Action.

4.16.3.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of soil resources for this alternative would be the same as for the Proposed Action, with the addition of additional irreversible removal of soil resources around the pole site.

4.16.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity of soils caused by this alternative would be the same as for the Proposed Action.

4.16.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Since this alternative would utilize existing roads for mine access, this alternative would not result in any new additional disturbance to soil resources from what is detailed for the Proposed Action because the soils in the roadways have already been disturbed. Additional direct impacts to soil resource are not anticipated because no further disturbance of the roadways is proposed, beyond necessary maintenance of the roadway. The continual use of Three Bars Road and Atlas Haul Road would increase the risk of soil erosion; however, this impact would be considered short-term, localized, and negligible.

4.16.4.1 Unavoidable Adverse Impacts

Impacts to soil resources from this alternative are not anticipated, there are no unavoidable adverse impacts.

4.16.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of soil resources are not anticipated from this alternative.

4.16.4.3 Relationship of Short-Term Uses and Long-Term Productivity

No impacts are anticipated to soil resources from this alternative; therefore, soil productivity would not change from current conditions from implementation of this alternative.

4.16.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. The Mount Hope Road is an existing authorized road that goes through the authorized Mount Hope Project. No additional disturbance is proposed to Mount Hope roads beyond what was permitted by the Mount Hope Project. As with other portions of the Project, the continual use of the Mount Hope roads would increase the risk of soil erosion, however, this impact would be considered short-term, regional (since the Mount Hope access road and well field road occur outside of the Project area), but negligible.

4.16.5.1 Unavoidable Adverse Impacts

Impacts to soil resources from this alternative are not anticipated, there are no unavoidable adverse impacts.

4.16.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of soil resources are not anticipated from this alternative.

4.16.5.3 Relationship of Short-Term Uses and Long-Term Productivity

No impacts are anticipated to soil resources from this alternative; therefore, soil productivity would not change from current conditions from implementation of this alternative.

4.16.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not be constructed, and there would be no associated Project impacts. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. The soil types within the Notice-level activities are included in **Table 4.16-3**.

Table 4.16-3 Third-Order Soil Map Units within the Notice-Level Areas

Map Unit Number	Map Unit Name
511	Ansping-Hymas association
830	Atrypa gravelly loam, 30 to 50 percent slopes
280	Coils loam, 2 to 8 percent slopes
552	Decram-Hapgood-Loncan association
451	Foxmount-Haunchee-Rock outcrop association
462	Haunchee-Hatur-Rock outcrop association
222	Hodedo-Coils association
330	Hopeka-Solak-Ados association
331	Hopeka-Solak-Rock outcrop association
501	Hymas-Ansping association
111	Lien-Hayeston association
701	Loncan-Gando-Glean association
762	Shagnasty-Softscrabble association
201	Umil loam, 2 to 8 percent slopes
770	Welch loam, drained, 0 to 4 percent slopes

Notice-level activities may include direct soil removal, compaction, and soil redistribution associated with drill pad and drill road construction within all these soil types. Use of existing roadways would result in increased potential for soil erosion from wind and water due to the lack of vegetation or protective cover, and additional soil compaction.

The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations (not including access roads). Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action).

The existing disturbance areas likely have an altered biological soil crust composition in relation to the surrounding landscape. Additionally, vehicle traffic on the existing roadways would prevent the colonization of biological soil crust species. Soils would continue to be subject to disturbance under this alternative. Potential impacts to soils would be minimized under the Notice-level authorizations through reclamation of drilling activities, including regrading, reseeding and reclamation of the disturbed sites after exploration activities have ceased. Impacts to soils from this alternative are expected to be minor, long-term, and localized.

4.17 Vegetation

4.17.1 Indicators

The analysis of potential direct and indirect effects includes general vegetation, noxious weeds, and invasive and non-native plants within the Plan boundary. Indicators for effects to vegetation resources focused on the duration and acreage of vegetation community disturbance, biological importance of the resource, and susceptibility to disturbance. Additionally, indicators for noxious weeds and non-native invasive species considered proximity of known occurrences to proposed disturbances and acreage of disturbance. Significance criteria for special status species focused on disturbance of potential habitat and potential for take of special status plant species as follows:

- Eliminate, reduce, or adversely affect a unique or rare native plant community;
- Violation of any Federal, State, or County laws;
- Substantially affect a species or its habitat protected under the ESA or state law, or designated as having special status by a state or federal agency; and/or
- Increased likelihood for introduction of or spread of noxious weeds or non-native invasive species into relatively weed-free areas.

Effect Context for Vegetation

Localized: Effects would occur inside the Project area.

Regional: Effects would occur outside of the area of analysis to the adjacent vegetation communities.

Duration of Effects Definitions for Vegetation

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last beyond the duration of the Project.

Intensity of Effects Definitions for Vegetation

Negligible: Effects on vegetation would be so small it would not be measurable or perceptible. Vegetation communities would not be extensively altered and there would be no effect on the biological value or distribution of plant communities.

Minor: Effects on vegetation would be detectable, measurable, and perceptible, but would occur within the Project area and would not impact the overall biological value or distribution of plant communities. Effects would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project.

Moderate: Effects on vegetation would be readily apparent, measurable, large and of consequence, but would occur within the Project area. Impacts may occur to the overall biological

value or distribution of plant communities. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary, but these measures would most likely be effective.

Major: Effects on vegetation would occur and would substantially change the biological value or distribution of plant communities. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary, but these measures would need to be monitored to determine their effectiveness.

4.17.2 Direct and Indirect Impacts of the Proposed Action

Vegetation Communities

Direct impacts of the Proposed Action would include removal of approximately 1,129 acres of vegetation, which includes disturbance associated with exploration activities but not the 25 acres of non-MMI disturbance to be reclaimed. Loss of vegetation would result from construction of process facilities and ponds, shop facilities, administration buildings, laydown yards, pit excavations, WRDAs, HLP, growth media stockpiles, landfill, sediment basins, and improvement or construction of roads. **Table 4.17-1** shows the acreage disturbed for each vegetation community within the Plan boundary. None of the four vegetation community types within the Plan boundary are considered unique or rare. The limber pine community is present in a limited area (eight acres) within the Plan boundary; however, the Proposed Action would not disturb this small community. The other three vegetation community types are prevalent in areas adjacent to the Project and throughout central Nevada. Additionally, approximately 12 percent of the acreage (654 acres) within the 5,561-acre Plan boundary has previously been disturbed from exploration and mining ventures. The vegetation community with the most affected acreage would be the pinyon-juniper woodland.

Table 4.17-1 Vegetation Community Disturbance from the Proposed Action

Vegetation Community	Acres within Plan Boundary	Proposed and Existing Disturbance (acres)[1]	Percent of Total Project Disturbance	Proposed Reclamation (acres)	Proposed Permanent Disturbance (acres)
Curl-leaf Mountain Mahogany Woodland	1,189	167	16	117	50
Limber Pine	8	0	0	0	0
Pinyon/Juniper Woodland	3,321	482	45	467	15
Sagebrush Steppe	101	20	2	18	2
Existing Disturbance	660[2]	395	37	308	87
Total	**5,279[3]**	**1,064**	**100**	**910[1]**	**154**

[1] Disturbance and reclamation acreage does not include 65 acres for exploration that could occur anywhere within the Plan boundary, and would also be reclaimed. Including the 65 acres of exploration activities, total Project disturbance is 1,129 acres, and the total area reclaimed would be 975 acres.
[2] Existing disturbance within the Plan boundary includes 654 acres of past mining experience and approximately six acres of North Roberts Creek Road.
[3] Acreage within this table does not include Project access roads, which totals approximately 282 acres.

The Proposed Action would result in the disturbance of 482 acres of pinyon-juniper woodlands, of which 467 acres would be reclaimed. With the abundant seed source in undisturbed areas within and adjacent to the Project area, single-leaf pinyon and Utah juniper would likely re-establish in the reclaimed areas. However, mature woodlands could take 50 to 100 or more years to fully develop. The Proposed Action would disturb 167 acres of curl-leaf mountain mahogany woodland, of which 117 acres would be reclaimed. Curl-leaf mountain mahogany seeding or planting is not currently proposed as part of the reclamation, although surrounding trees could provide a seed source. Mahogany is a slow growing species and woodlands could take hundreds of years to naturally establish and mature within these reclaimed areas. The Proposed Action would result in the disturbance of 20 acres of sagebrush steppe, of which 18 acres would be reclaimed; the remaining two acres would be part of the unreclaimed pit area.

Most disturbance would come from the WRDAs, open pits, and the HLP. Reclamation is detailed in Section 2.2.19. In addition to other Project facilities, the WRDAs and HLP would be reclaimed. The WRDAs would be regraded as shown in **Figure 2.2-16** and revegetated as described in the *Conceptual Reclamation/Revegetation Plan* (Cedar Creek, 2016). The top and side-slopes of the HLP would be regraded, compacted, covered with growth media and then revegetated (seeded). Perimeter berms constructed around the pit perimeters would also be revegetated.

Overall, 975 acres (86 percent) of the total disturbance (including exploration disturbance but not the 25 acres of non-MMI disturbance to be reclaimed), would be reclaimed and revegetated which would minimize the impacts to vegetation communities. Unreclaimed features include pits, ponds, some roads, and stormwater diversion channels, totaling 154 acres (14 percent) of total disturbance within the Plan boundary. The initial BLM-approved reclamation seed mix and application rates is outlined in **Table 2.2-16**, but would be subject to change with results from test plots, as outlined in the *Conceptual Reclamation/Revegetation Plan* (Cedar Creek, 2016). Except for existing tree species, the seed mix would likely provide for species similar to pre-disturbance communities. BLM could modify the seed mixture and application rates prior to application based on interim seeding success and to meet reclamation goals. Interim reclamation would occur on the growth media stockpiles and cut-and-fill slopes. Concurrent reclamation would occur during the mine operation. Reclamation is anticipated to be completed within six years following cessation of mining and residual heap leaching; however, prolonged drought could delay revegetation activities.

Indirect impacts to vegetation communities would include the potential for spread and introduction of noxious weeds and non-native invasive species; the loss of forage for wildlife, wild horses, and livestock; and potential for increased soil erosion. Indirect impacts that relate to other resources are discussed further in their respective sections of this EIS.

Overall impacts to vegetation communities would be long-term, localized, and minor. The Proposed Action would disturb 718 acres of previously undisturbed vegetation communities. Fourteen percent of the total disturbance from the Proposed Action would remain after mine closure; the remaining 86 percent would be reclaimed. MMI could conduct up to 65 acres of exploration within the Plan boundary; however, these areas would be reclaimed. Additionally, MMI

has committed to reclaiming approximately 25 acres of existing disturbance that would not be impacted by the Proposed Action.

Use of the parking lot in the town of Eureka would have negligible impacts on vegetation resources since it has already been disturbed and improved, and there is only sparse vegetation existing at the perimeter of the lot. Surfacing of the lot with gravel may have helped reduce the potential spread of noxious weeds and non-native invasive species.

Potential Vegetation Communities

Direct impacts to ecological sites include 718 acres of new disturbance from the Proposed Action. **Table 4.17-2** displays the Project disturbance and reclamation acreage by ecological site. Ecological sites are based on site potential and would not necessarily be the benchmark for the reclaimed areas. However, the *Conceptual Reclamation/Revegetation Plan* (Cedar Creek, 2016) indicates that species similar to those native species currently present on site would be part of the reclamation seed mix. Ecological site potential is based on an absence of anthropogenic disturbance; therefore, mining would result in a new steady-state within the sites' STM post-reclamation. No indirect impacts to ecological sites are anticipated from the Proposed Action. Overall, impacts to ecological sites would be long-term, localized, and minor. The majority of Project disturbance would be reclaimed, although the ecological site potential may not exist post-mining.

Table 4.17-2 Ecological Site Disturbance from the Proposed Action

Ecological Site	Acres within Plan Boundary	Proposed Disturbance (acres)[1]	Percent of Total Project Disturbance	Acres Proposed Reclamation (acres)	Proposed Permanent Disturbance (acres)
Calcareous Mahogany Savanna	440	45	4	30	15
Loamy 10-12" P.Z.	8	8	1	8	0
Loamy 12-16" P.Z.	76	2	0	2	0
Loamy 16"+ P.Z.	52	0	0	0	0
Loamy Bottom 14" + P.Z.	1	1	0	1	0
Mahogany Thicket	800	127	12	92	35
Mountain Ridge 14"+ P.Z.	72	8	1	6	2
Shallow Calcareous Loam 10-12" P.Z.	1	1	0	1	0
PIMO-JUOS WSG:0R0501 / PIMO-JUOS WSG:0R0504	3,169	477	45	462	15
Existing Disturbance	660[2]	395	37	308	87
Total	**5,279[3]**	**1,064**	**100**	**910[1]**	**154**

[1] Disturbance and reclamation acreage does not include 65 acres for exploration that could occur anywhere within the Plan boundary, and would also be reclaimed. Including the 65 acres of exploration activities, total project disturbance is 1,129 acres, and the total area reclaimed would be 975 acres.
[2] Existing disturbance within the Plan boundary includes 654 acres of past mining experience and approximately six acres of North Roberts Creek Road.
[3] Acreage does not include Project access roads, which totals approximately 282 acres.

Noxious Weeds and Non-native Invasive Species

Direct impacts to vegetation resources from noxious weeds and non-native invasive species would include the establishment and spread of these species during construction or reclamation. The Proposed Action would disturb or remove approximately 135 acres of existing musk and/or bull thistle infestations, mainly along existing roads and in the areas of the proposed Ridge Lower and Upper Dump and the Gold Pick Pit, which would remove the existing weeds from these areas during operations. However, weed seed or rhizomes could be transported in the soil removed in the areas where weeds are existing, and without proper treatment could create further infestations. The Proposed Action would disturb 1,129 acres (including exploration activities), which would be susceptible to weed invasion. The EPMs, outlined in Section 2.2.20 Invasive, Non-native Species, would substantially reduce the spread and establishment of noxious weeds and non-native invasive species from the Proposed Action. These practices include pre-disturbance surveys to identify populations or infestations, education of Project personnel, and adherence to their *Noxious Weed Plan* (GBE, 2013b). Additionally, all seed mixes and natural erosion products used would be certified weed-free. Gravel borrow areas within the Project would comply with the requirements of the *Noxious Weed Management Plan*, which is included as Appendix D of the Plan. The use of any gravel source would follow the requirements of Nevada's Weed-Seed Free Gravel certification program that requires inspection of a borrow source to verify that noxious weeds are not present prior to using material from the source. Weed control practices would be implemented in coordination with BLM.

Although the lack of competition from established desired perennial species during initial reclamation provides opportunity for weed establishment, successful reclamation and presence of a perennial vegetation community would reduce the potential for spread and establishment of weedy species. However, certain Project components (e.g., roads and laydown yards) may experience short-term localized weed establishment from annual non-native invasive species (e.g., cheatgrass, saltlover), especially if currently present within the Project area. Where the non-backfilled pit areas would not be reclaimed, noxious weed establishment would be unlikely given the lack of soil/growth media within the pits.

An indirect impact from the spread and establishment of noxious weeds and non-native invasive species would be decreased resilience in native plant communities. Native plant communities would be less resilient to disturbance (e.g., wildfire, drought) with the presence of weedy species, which increases susceptibility for transition to a less desirable vegetative state and makes restoration of the invaded communities more difficult. Another indirect impact includes the increased use of herbicide to treat weedy species, posing potential risks to wildlife, native plants, and humans.

Impacts from the Proposed Action on the spread and establishment of noxious weeds and non-native invasive species are expected to be long-term, regional, and minor, given the EPMs outlined in Section 2.2.20 Invasive, Non-native Species. The Proposed Action would be in conformance with federal and state laws pertaining to noxious weeds.

Special Status Species

Three special status plant species have the potential to occur in the Project area; however, none were identified during baseline surveys conducted in 2012. Direct and indirect impacts to special status plant species would include the disturbance of 669 acres of vegetation communities that may provide potential habitat for least phacelia, Beatley buckwheat, and Monte Neva paintbrush. Potential habitat for least phacelia and Monte Neva paintbrush was not mapped within the Plan boundary (GBE, 2013a); therefore, it is unlikely that the Proposed Action would have any detrimental impacts to either species or their habitat. A known occurrence of Monte Neva paintbrush is within 1.5 miles of the Three Bars Road; however, increased dust from traffic along this road would not be likely to indirectly impact this occurrence due to distance from the road. Additionally, Beatley buckwheat is generally associated with low sagebrush communities, which were limited within the Plan boundary during surveys in 2012 (GBE, 2013a). No Beatley buckwheat plants were observed during surveys; therefore, the Proposed Action would not directly impact this species. Indirect impacts may occur from removal of the limited low sagebrush dominated communities, which serves as potential habitat, within the Plan boundary.

Impacts to special status plant species from the Proposed Action are expected to be long-term, localized, and negligible. The Proposed Action would be in conformance with the ESA and other Federal regulations regarding special status plant species.

4.17.2.1 Unavoidable Adverse Impacts

Vegetation

The Proposed Action would permanently disturb 154 acres, of which 87 acres is existing disturbance and 67 acres are vegetation communities. These areas would not be reclaimed after mine closure.

Noxious Weeds and Non-Native Invasive Species

Even with the implementation of the EPMs (Section 2.2.20 Invasive, Non-native Species), disturbance from the Proposed Action could provide an opportunity for the potential spread and establishment of noxious weeds and non-native invasive species within the Project area.

Special Status Plant Species

No unavoidable adverse impacts to special status plant species are anticipated from the Proposed Action.

4.17.2.2 Irreversible and Irretrievable Commitments of Resources

Vegetation

The curl-leaf mountain mahogany and pinyon-juniper woodlands removed due to disturbance from the Proposed Action would take a long time to re-establish within the reclaimed areas representing an irreversible commitment of these resources. However, the pinyon-juniper woodland is not a rare or unique community type and 2,839 acres of pinyon-juniper woodland would not be disturbed within the Plan boundary. Additionally, 167 acres (14 percent) of the curl-leaf mountain mahogany woodland present within the Plan boundary would be removed from the Proposed Action.

Noxious Weeds and Non-Native Invasive Species

No irreversible or irretrievable commitments for noxious weeds or non-native invasive species are anticipated from the Proposed Action.

Special Status Plant Species

Although the Proposed Action is not anticipated to directly impact any special status plant individuals or populations, potential habitat for these species could be disturbed or removed from the Proposed Action. The potential habitats would take a long time or may never re-establish within the disturbed and reclaimed areas constituting an irreversible commitment of the habitats for these species.

4.17.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Vegetation

The removal of vegetation would reduce availability of vegetation resources for use by wildlife, livestock, and wild horses in the short-term. However, large areas (approximately 4,510 acres) within the Project boundary consist of pinyon-juniper or curl-leaf mountain mahogany woodland which provide no forage area for livestock. Additionally, long-term productivity of these vegetation communities could be increased or decreased in quantity and quality from existing conditions, based on the success of the reclamation.

Noxious Weeds and Non-Native Invasive Species

If the Noxious Weed Management Plan is ineffective, impacts to the long-term productivity from the spread or establishment of noxious weeds and non-native invasive species may result in reduced success in reclaimed areas from competition and reduced resilience within surrounding undisturbed communities.

Special Status Plant Species

Impacts from short-term use of the Project area may reduce the long-term productivity of certain habitats for special status species, were they to become established.

4.17.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Vegetation Communities

Direct impacts from this alternative in addition to those realized under the Proposed Action would include removal of approximately 130 acres of vegetation. Loss of vegetation would result from construction of the powerline and maintenance access road. **Table 4.17-3** shows the potential acreage disturbed for each vegetation community within the power line ROW. None of the vegetation community types present are considered unique or rare. The Sagebrush Steppe and Inter-Mountain Basins Big Sagebrush Shrubland would be the communities most disturbed from this alternative (i.e., 86 percent of total disturbance). Revegetation would occur after construction within the ROW after construction. Sagebrush dominated communities are prevalent in areas adjacent to the power line ROW and may naturally establish in the disturbed areas.

Table 4.17-3 Vegetation Community Disturbance within the 25 kV Distribution Line 40-foot Right-of-Way

Vegetation Community	40-foot ROW Proposed Disturbance (Acres)
GBE Mapped Communities	
Pinyon/Juniper Woodland	5
Sagebrush Steppe	38
ReGAP Land Cover Types<1	
Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland	1
Great Basin Pinyon-Juniper Woodland	3
Great Basin Xeric Mixed Sagebrush Shrubland	7
Inter-Mountain Basins Big Sagebrush Shrubland	74
Inter-Mountain Basins Big Sagebrush Steppe	1
Inter-Mountain Basins Mixed Salt Desert Scrub	1
Total	**130**

Source: GBE (2013a) and USGS (2005)

Indirect impacts to vegetation communities would include the potential for spread and introduction of noxious weeds and non-native invasive species; the loss of forage for wildlife, wild horses, and livestock; and potential for increased soil erosion. Overall, direct and indirect impacts to vegetation communities for this alternative would be long-term, regional (i.e. occurring outside of the Project area), and minor.

Potential Vegetation Communities

Direct impacts to ecological sites include those described for the Proposed Action and an additional 130 acres of disturbance from this alternative. **Table 4.17-4** displays the potential disturbance acreage by ecological site. Revegetation would occur within the ROW. The ecological site potential would likely remain the same for disturbed areas. The steady-state achieved post-construction would depend on the native, noxious, and non-native species able to establish in the disturbed areas. No indirect impacts to ecological sites are anticipated from this alternative. Overall, impacts to ecological sites would be long-term, regional, and minor.

Table 4.17-4 Ecological Site Disturbance from the 25 kV Overhead Distribution Line Alternative

Ecological Site Name	Ecological Site ID	40-foot Permanent ROW Proposed Disturbance (Acres)	
		BLM	Private
Loamy 8-10” P.Z.	R028BY010NV	85	3
Loamy 10-12” P.Z.	R028BY007NV	6	1
Loamy Bottom 14” + P.Z.	R028BY024NV	0	2
Shallow Calcareous Loam 8-10” P.Z.	R028BY011NV	13	0
Shallow Calcareous Slope 8-10” P.Z.	R028BY016NV	1	0
Silty 8-10“ P.Z.	R028BY013NV	0	1

Ecological Site Name	Ecological Site ID	40-foot Permanent ROW Proposed Disturbance (Acres)	
		BLM	Private
Sodic Flat 5-8" P.Z.	R028BY020NV	1	0
PIMO-JUOS WSG:0R0501 / PIMO-JUOS WSG:0R0504	F024XY049NV F024XY051NV	6	0
PIMO-JUOS WSG:0R0504	F028BY060NV	11	0
Total		**123**	**7**
Grand Total			**130**

Source: GBE (2013) and NRCS (2015)
Note: Acreages presented in table exclude areas within the Plan boundary.

Noxious Weeds and Non-native Invasive Species

Baseline data for the presence of noxious weeds and non-native invasive species was not collected for the 25 kV power line ROW, so the presence of these species is unknown. However, direct impacts include the disturbance of 130 acres and the opportunity for the establishment of noxious weeds or non-native invasive species in these areas. Additionally, this ROW would be held by Mt. Wheeler and, therefore, it is not included under the *Noxious Weed Plan* (GBE, 2013b) for the Project area. The spread of weed seed could also occur from vehicles traveling along the maintenance access road.

Indirect impacts from noxious weeds and non-native species includes the potential to spread from the disturbed areas into surrounding native plant communities, reducing site resilience.

Overall, impacts to vegetation resources from noxious weeds and non-native species for this alternative would be long-term, regional, and minor.

Special Status Species

Baseline surveys for special status species were not conducted for the 25 kV power line ROW, so presence of these species is unknown. However, NNHP (2016) indicated the potential for Beatley buckwheat and least phacelia to occur along the ROW. On the portion that overlaps the Falcon to Gonder power line corridor, no species were identified during 1999 and 2000 surveys (BLM, 2001a). Direct impacts from this alternative include the disturbance of 130 acres of potential habitat for special status species. Additionally, without a survey identifying known locations, or lack thereof, for special status species, the construction of the power line could disturb or remove individuals or populations. No indirect impacts to special status species would be anticipated with this alternative. Overall, impacts to special status species would be long-term, regional, and negligible.

4.17.3.1 Unavoidable Adverse Impacts

Vegetation

This alternative would disturb 130 acres of vegetation communities.

Noxious Weeds and Non-Native Invasive Species

This alternative would provide the opportunity for the potential spread and establishment of noxious weeds and non-native invasive species within the power line corridor and adjacent vegetation communities.

Special Status Plant Species

No unavoidable adverse impacts to special status plant species are anticipated from this alternative.

4.17.3.2 Irreversible and Irretrievable Commitments of Resources

Vegetation

The eight acres of pinyon-juniper woodlands removed due to disturbance from this alternative would take a long time to re-establish within the reclaimed areas, representing an irreversible commitment of this resource. However, the pinyon-juniper woodland is not a rare or unique community type and would be present adjacent to the power line corridor.

Noxious Weeds and Non-Native Invasive Species

No irreversible or irretrievable commitments for noxious weeds or non-native invasive species are anticipated beyond what is detailed under the Proposed Action.

Special Status Plant Species

This alternative could directly impact special status plant individuals or populations, and potential habitat for these species could be disturbed or removed during construction of the power line. These potential habitats would take a long time or may never re-establish within the disturbed areas, representing an irreversible commitment of this habitat.

4.17.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Vegetation

The removal of vegetation would reduce availability of these resources for use by wildlife, livestock, and wild horses during the operations. Additionally, long-term productivity of these vegetation communities could be increased or decreased in quantity and quality from existing conditions, based on how the area reestablishes with reclamation.

Noxious Weeds and Non-Native Invasive Species

Impacts to the long-term productivity from the spread or establishment of noxious weeds and non-native invasive species include reduced success in reclaimed areas from competition and reduced resilience within surrounding undisturbed communities.

Special Status Plant Species

No impacts to short-term use or long-term productivity to special status species or their habitat are anticipated from this alternative.

4.17.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. No additional direct impacts to vegetation resources would be anticipated from this alternative beyond what has been described for the Proposed Action because Three Bars Road and Atlas Haul Road are considered existing road disturbance. One indirect impact from this alternative would be the reduced potential for the spread of noxious weeds and non-native species along the Roberts Creek Road because this road would not be utilized for light-duty vehicles accessing the mine.

4.17.4.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.17.4.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources to those described for the Proposed Action are anticipated for this alternative.

4.17.4.3 Relationship of Short-Term Uses and Long-Term Productivity

No additional impacts to short-term use or long-term productivity of rangeland resources to those described for the Proposed Action are anticipated for this alternative.

4.17.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. No additional direct impacts to vegetation resources would be anticipated from this alternative. North Roberts Creek Road disturbance was included as part of the Proposed Action. Mount Hope mine access and well field roads are considered existing authorized road disturbance. Impacts from these roads were analyzed for the Mount Hope Project (BLM, 2012a). Indirect impacts would be long-term, regional, and negligible and include the potential for noxious weeds and non-native species spread along Mount Hope roads from the travel of light-duty vehicles accessing the mine.

4.17.5.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.17.5.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources to those described for the Proposed Action are anticipated for this alternative.

4.17.5.3 Relationship of Short-Term Uses and Long-Term Productivity

No additional impacts to short-term use or long-term productivity of rangeland resources to those described for the Proposed Action are anticipated for this alternative.

4.17.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. The vegetation types within the authorized Notice-level area include curl-leaf mountain mahogany, pinyon-juniper woodland, and sagebrush. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action). This may have a long-term impact on vegetation, since without reclamation of these disturbed areas, and without the implementation of the Noxious Weed Management Plan under this alternative, noxious weeds and non-native invasive species may spread throughout the Project area. Impacts to vegetation from this alternative are expected to be minor, localized, and long-term.

4.18 Visual Resources

4.18.1 Indicators

Each of the alternatives considered in this EIS was analyzed for its potential to result in effects on visual resources. The following indicators were considered when analyzing the potential effects that each alternative would have on visual resources:

- Degree of contrast or conflicts with established BLM VRM class objectives; and
- Change in the scenic quality of the existing characteristic landscape from KOPs due to visibility of components of the Proposed Action or alternatives to the Proposed Action.

A comparison of the Project features that would be visible under each alternative and the existing landscape features was performed from each KOP (**Figure 3.18-3**). Computer-generated visual simulations of the Project were produced to help visualize the changes that would be imposed on the existing landscape as viewed from the KOP.

The proposed power line that would be constructed under implementation of this alternative was not modeled for the visual simulations. The power line was not simulated because of its simplicity and commonality.

The visual simulations were reviewed to identify the form, line, color, and texture that characterize the Project. This information was compared with the form, line, color, and texture elements of the existing landscape in order to quantify the degree of contrast the alternatives would be expected to have. The results of this comparison and expected degree of contrast were applied to the effect indicators listed above to determine the potential for each alternative to impact visual resources. The photographs of the existing characteristic landscape and the visual simulations prepared for each alternative are provided in **Appendix C**.

Effect Context for Visual Resources

Localized: Activities would affect the viewshed within the Project area, but would not be visible outside of the Project area.

Regional: Activities would affect the viewshed within the Project area, as well as outside of the Project area.

Duration of Effects Definitions for Visual Resources

Temporary: Effects would occur during construction activities (i.e., six months to one year), or during maintenance activities.

Short-term: Effects would last for the duration of the Project.

Long-term: Effects would last longer than the duration of the Project.

Permanent: Effects to the viewshed would be permanent.

Intensity of Effects Definitions for Visual Resources

Negligible: Effects would not result in any perceptible changes to existing viewsheds or the scenic quality of the existing characteristic landscape. Modifications to the scenic quality of the existing landscape would be consistent with VRM class objectives.

Minor: Effects would result in changes to the viewshed and the scenic quality of the existing characteristic landscape, but these effects would not result in a significant degree of contrast with the existing landscape. Modifications to the scenic quality of the existing landscape would be consistent with VRM class objectives. Effects would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project.

Moderate: Changes to the viewshed and the scenic quality of the existing characteristic landscape would readily apparent, which would result in a noticeable degree of contrast with the existing landscape. Visual effects may not be consistent with VRM class objectives. Mitigation beyond the

applicant-committed EPMs and BMPs may be necessary, but these measures would most likely be effective.

Major: The Project would result in significant effects to the viewshed and the scenic quality of the existing characteristic landscape, and it would introduce a strong degree of contrast with the existing landscape. Visual effects would not be consistent with VRM class objectives. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary to reduce adverse impacts, and these measures would need to be monitored to determine their effectiveness.

4.18.2 Direct and Indirect Impacts of the Proposed Action

Construction of mining and processing facilities would require surface disturbance that removes existing vegetation cover from within the Project area. Removal of vegetation cover would introduce form, line, color, and texture elements that contrast with the features of the existing landscape. Construction would also require mass-grading or reshaping of soils and landforms for the construction of roads, pits, WRDAs, HLP, and other Project facilities described in Chapter 2. The removal of vegetation cover and mass movement of soils and landforms would introduce form, line, color, and texture elements that contrast with the features of the existing landscape.

Implementation of the Proposed Action would require ancillary facilities and structures to be installed, including fencing and buildings, such as a mine administrative office and truck shop. These Project components and facilities would also introduce form, line, color, and texture elements that contrast with the features of the existing landscape. The proposed parking area along Highway 50 would also add contrasting form, line, color, and texture elements to the landscape.

The contrasting visual resource elements introduced by the Project are anticipated to last through the life of the Project. Project personnel, materials, vehicles, and equipment present in the Project area during construction and operation of mining and processing facilities may be visible from outside the Project area boundaries at times, and would also introduce form, line, color, and texture elements that contrast with the features of the existing landscape.

Concurrent reclamation during operation of the Project would reduce the degree of contrast between the existing landscape features and mining and processing facilities. During final reclamation of the Project area, all Project materials, vehicles, and equipment would be removed from the Project area. Fencing, power lines, and other ancillary facilities and structures would be disassembled and removed from the area. Project features would be graded to contours that resemble surrounding landforms to the extent possible and then seeded to establish vegetation cover. Thus, reclamation would reduce the visibility of the Project and lessen the degree of contrast it would have with existing landscape features.

Use of the parking lot in the town of Eureka would have negligible impacts on the viewshed in that area, since the lot is already disturbed. The addition of vehicles may add different forms, lines,

colors, and textures than what is currently existing, but this is anticipated to be short-term, regional, and negligible since it is within the town of Eureka where the site of vehicles is common.

Mining and processing facilities would be located on BLM-administered public lands that have been designated as VRM Class IV, as shown on **Figure 3.18-3**. The changes to the scenic quality of the existing characteristic landscape from each of the KOPs (**Figure 3.18-3**) as a result of the addition of these elements are discussed below. The degree of contrast that the form, line, color, and texture elements of the Project would have with the features of the existing landscape at the KOPs is also discussed below.

KOP 1: Northeasterly Viewing Angle

As shown on the visual simulations for KOP 1: Northeasterly Viewing Angle (**Appendix C**), only a very small portion of a proposed pit would be visible during operations. The pit would have a very thin, nearly rectangular form. The pit wall would be dark gray and brown, with a coarse texture. Considering how little of mining and processing facilities would be visible from KOP 1: Northeasterly Viewing Angle, visual contrast would be regional and negligible.

All of mining and processing facilities, including the small portion of a pit that would be visible from KOP 1: Northeasterly Viewing Angle, would be located on BLM-administered public land designated as VRM Class IV (**Figure 3.18-3**). As described in **Table 3.18-1**, BLM VRM Class IV objectives indicate that the level of change to the landscape may be high, and activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the form, line, color, and texture elements found in the existing landscape.

Mining and processing facilities would not conflict with established BLM VRM class objectives, and therefore, no effects on visual resources associated with the first effects indicator identified in Section 4.18.1 would be anticipated. The second effects indicator identified in Section 4.18.1 pertains to changes in the scenic quality of the existing landscape due to visibility of the Project. The anticipated effects on visual resources related to this indicator would be regional and negligible because of how little of the Project would be visible from the KOP. The visible portion of the pit would not attract the attention of the casual observer or dominate the landscape. However, the anticipated negligible effects from mining and processing facilities on visual resources would be considered both long-term and permanent because they would persist during and beyond the life of the Project, with some of the visible pits not being reclaimed.

KOP 1: Northwesterly Viewing Angle

According to the visual simulations (**Appendix C**), the most visible components of mining and processing facilities during operation of the Project would be the HLP, WRDAs, and the Gold Pick Pit. The HLP would be located approximately 1.8 miles away from the KOP, placing it within the foreground-middleground zone of the landscape. The WRDA and pit would be more than three miles away, within the background distance zone.

Although the HLP would be constructed as a series of slopes separated by slope benches (**Figure 2.2-12**), it would be located too far away from KOP 1 for benches and slopes to be discernible. Instead, the entire HLP would appear as a large trapezoidal-shaped form that is gently sloping and somewhat rounded. During operation of the Project, the HLP would not be vegetated and would be varying shades of gray and brown, corresponding with different rock types. The gray and brown color of the HLP would accentuate its trapezoidal-shaped form amongst the existing surrounding dark green and olive vegetation cover. The top and side edges of the HLP would add a curving line to the landscape, while the bottom edge would add a nearly straight horizontal line. The curving line along the top edge would be somewhat repetitive of the line elements associated with existing lower hills in the landscape.

The WRDAs would add additional large trapezoidal-shaped forms similar to that created by the HLP. The WRDAs would have a coarse texture that is varying shades of dark gray and brown. The WRDAs would be constructed steeper than the HLP, which would make them appear to have less of a rolling curving line along the top and side edges than the HLP. Instead, short diagonal lines would be formed by the sides of WRDAs and straight horizontal lines would be formed along the top edges.

Trapezoid-shaped forms are not present in the existing landscape, thus, the form of the HLP and WRDAs would create visual contrast during operation. Slight variations in existing vegetation cover in the foreground-middleground zone create subtle horizontal lines, lessening the degree of contrast that the horizontal lines on the HLP and WRDAs would have with the landscape. However, the contrasting color, texture, and form elements of the HLP and WRDAs would accentuate their existence in the landscape and make it ready apparent to the casual observer from KOP 1: Northwesterly Viewing Angle. Both would have a long-term, regional, moderate degree of visual contrast.

The proposed pits would appear as an irregular-shaped form that is light to dark gray and brown in color. The top edge of the Gold Pick Pit would form a strong irregular silhouette line against the backdrop of the sky that is generally smooth and rolling. This would be repetitive of the smooth and rolling silhouette line formed by the crest of the Roberts Mountain when viewed from KOP 1: Northwesterly Viewing Angle. However, the dark gray and brown colors of all the pits would have a strong degree of contrast with the surrounding vegetation in the background distance zone, which is generally dark green and dark olive. The contrasting color of the mine pits would accentuate their irregular-shaped form, which would make them readily noticeable from KOP 1: Northwesterly Viewing Angle.

The irregular-shaped form and color of the proposed mine pits would not be similar to form and color elements found in the background zone of the existing landscape. Thus, the proposed mine pits would have a strong degree of contrast with the existing landscape, and would be expected to attract the attention of the casual observer from KOP 1.

The visual simulations also show that a proposed growth medium stockpile would be visible from the KOP in the foreground-middleground zone. The stockpile would appear as a very thin form

that is low to the ground surface. The color of the stockpile would be dark brown. No discernible line or texture elements would be associated with the stockpile because of its distance from the KOP. The dark brown color of the stockpile would appear similar in color to existing exposed topsoil in the foreground-middleground zone, reducing its contrast. Considering its small size and repetition of existing colors in the landscape, the proposed growth medium stockpile would not attract attention or dominate the view.

The visual simulations prepared for post-reclamation conditions (**Appendix C**) suggest that the proposed pits and WRDAs would be the most apparent component of the Project after operations cease. This is because pits would not be reclaimed and vegetation cover would not be restored on the portion of the pit wall visible from KOP 1: Northwesterly Viewing Angle. Other components of the mine visible from the KOP, such as the WRDA and HLP would be reshaped to more closely match natural topography in the area when possible. Additionally, vegetation cover would be restored on the tops of the reclaimed WRDAs and the top and side-slopes of the reclaimed HLP. Restoring vegetation on the side slopes of the HLP would greatly reduce its visual contrast because it would appear more similar in color to existing vegetation cover present throughout the landscape.

All mining and processing facilities would be located on BLM-administered public land designated as VRM Class IV (**Figure 3.18-3**). As described in **Table 3.18-1**, BLM VRM Class IV objectives indicate that the level of change to the landscape may be high, and activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the form, line, color, and texture elements found in the existing landscape.

Mining and processing facilities would not conflict with established BLM VRM class objectives, and therefore, no effects on visual resources associated with the first effects indicator identified in Section 4.18.1 would be anticipated. The second effects indicator identified in Section 4.18.1 pertains to changes in the scenic quality of the existing landscape due to visibility of the Project. The anticipated effects on visual resources related to this indicator would be regional and major because several components of the Project would be readily visible, including proposed mine pits and WRDAs, which would attract attention and persist after reclamation. The anticipated effects from mining and processing facilities on visual resources would be considered long-term and permanent because they would persist during and beyond the life of the Project, and the visible pits would not be reclaimed.

KOP 2: Northeasterly Viewing Angle

Mining and processing facilities would not visible from KOP 2: Northeasterly Viewing Angle. Impacts on the characteristic landscape of the KOP would not occur from mining and processing facilities.

KOP 2: Northwesterly Viewing Angle

Based on the visual simulations (**Appendix C**), mining and processing facilities would have no visual contrast with the characteristic landscape. The KOP is located more than 15 miles from the

facilities, and this distance makes all mining and processing facilities indiscernible from the KOP: Northwesterly Viewing Angle.

Mining and processing facilities would not conflict with established BLM VRM class objectives, and therefore, no effects on visual resources associated with the first effects indicator identified in Section 4.18.1 would be anticipated. The second effects indicator identified in Section 4.18.1 pertains to changes in the scenic quality of the existing landscape due to visibility of the Project. Mining and processing facilities would not be anticipated to have any effects on the scenic quality of the existing landscape in this view.

KOP 3: Northeasterly Viewing Angle

A small portion of a proposed pit would be visible from KOP 3: Northeasterly Viewing Angle (**Appendix C**). The portion of the pit that would be visible would have a thin and irregular form. The pit wall would be dark gray and brown, with an indistinguishable texture. These colors are present in existing disturbance and shrub vegetation cover that is also visible in the background zone surrounding the pit. Repetition of colors and textures common in the characteristic landscape would reduce the visual contrast of the pit wall.

Portions of the HLP and a WRDA would also be visible from KOP 3: Northeasterly Viewing Angle. The HLP and WRDA would each have a somewhat trapezoidal-shaped form. The top edge of the WRDA would form a straight horizontal line. There are very few trapezoidal-shaped forms or straight horizontal lines in the existing characteristic landscape. However, very little of both the HLP and WRDA would be visible, as existing topography would block views. Thus, visual contrast associated with the HLP and WRDA would be regional and minor. Contrast would also be minor because the light brown to brown color of the HLP and WRDA are repetitive of the brown colors of soils in the foreground zone.

The minor visual contrast of mining and processing facilities would not be a major change to the characteristic landscape. The facilities would not dominate the view or be the major focus of view attention from the KOP. Accordingly, mining and processing facilities would not conflict with the BLM VRM Class IV objectives in this view. Considering how little of mining and processing facilities would be visible from KOP 3: Northeasterly Viewing Angle, and how little visual contrast they would have, changes in the scenic quality of the existing landscape due to visibility of the Project would be negligible.

KOP 3: Northwesterly Viewing Angle

A small portion of a proposed pit would be visible from KOP 3: Northwesterly Viewing Angle (**Appendix C**). The portion of the pit that would be visible would have a thin and irregular form. The pit wall would be dark gray and brown, with an indistinguishable texture. These colors are present in existing disturbance and shrub vegetation cover that is also visible in the background zone surrounding the pit. Repetition of colors and textures common in the characteristic landscape would reduce the visual contrast of the pit wall. Additionally, the top edge of the pit wall would form an irregular silhouette line very similar to the silhouette line formed by the ridgeline of the Roberts Mountains. The visual contrast of mining and processing facilities that would be visible from KOP 3: Northwesterly Viewing Angle would be regional, permanent, and minor.

BLM VRM Class IV objectives indicate that the level of change to the landscape may be high, and activities may dominate the view and be the major focus of viewer attention. The portion of mining and processing facilities that would be visible from KOP 3: Northwesterly Viewing Angle would not dominate the view or be the major focus of view attention, as demonstrated on the visual simulations (**Appendix C**). Mining and processing facilities would be consistent with VRM Class IV. Considering how little of mining and processing facilities would be visible from KOP 3: Northwesterly Viewing Angle, and how little visual contrast they would have, changes in the scenic quality of the existing landscape due to visibility of the Project would be regional, permanent, and negligible.

KOP 4

Mining and processing facilities would not be visible from KOP 4. Existing topography and slopes between the KOP and facilities would block views from the KOP. Mining and processing facilities would not have any impact on the characteristic landscape of KOP 4.

VRM Class II

Proposed disturbance within the northern portion of the Pick Upper Area Access Road (approximately six acres), the buffers associated with the Pick Upper Area Access Road and the Pick East Upper Dump (approximately nine acres), portions of the Sediment Basin 5 access road (approximately one acre), and all of Sediment Basin 5 (approximately one acre) are within BLM VRM Class II (**Figure 4.18-1**). Existing disturbance within the VRM Class II area that would be incorporated into the proposed disturbance would be approximately two acres. These disturbances would not be consistent with the VRM Class II. As detailed in Table 3.18-1, the BLM VRM Class II objectives state: “The existing character of the landscape should be retained. The level of change to the characteristic landscape should be low. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape” (BLM, 1986f).

The Pick Upper Area Access Road dump would follow the form and line pattern of the existing dump in the area; however, it would extend further into the VRM Class II, creating a wide, moderately steep, almost pyramidal form with bold, horizontal lines. As the material is moved to the WRDA during operations, settling and separation of fines from material of a larger gradation may create a distinct break in the grade in some areas. During operations, the Pick Upper Area Access Road would create a medium, granular texture consisting of tan to brown colors. During operations, the Pick Upper Area Access Road would contrast with the form, line, color, and texture of the existing landscape. After reclamation, the texture and color would likely be more representative of existing conditions; however, the form and line modifications of the WRDA would still be apparent, and would be a long-term modification of the landscape. The visual contrast from the WRDA on the existing conditions would be localized and moderate, since it is essentially an extension of an existing WRDA. It is assumed that the WRDA buffer areas would be disturbed during operations. The buffers associated with the Pick Upper Area Access Road and Pick East Upper Dump within the VRM Class II area would create similar visual contrast as described above.

The sediment basin access road would follow the form, texture, and color of the existing roads within the VRM Class II area which would create an additional bold, linear form with a distinct,

striated texture. The sediment basin access road would be linear, but zig-zagged around existing topography and would lack vegetation, creating additional light tan colors in the VRM Class II area. The visual contrast from the sediment basin access road on the existing landscape would be localized (i.e., not seen from outside of the Project area) and minor, since it would be similar in form, line, color, and texture to the existing roads.

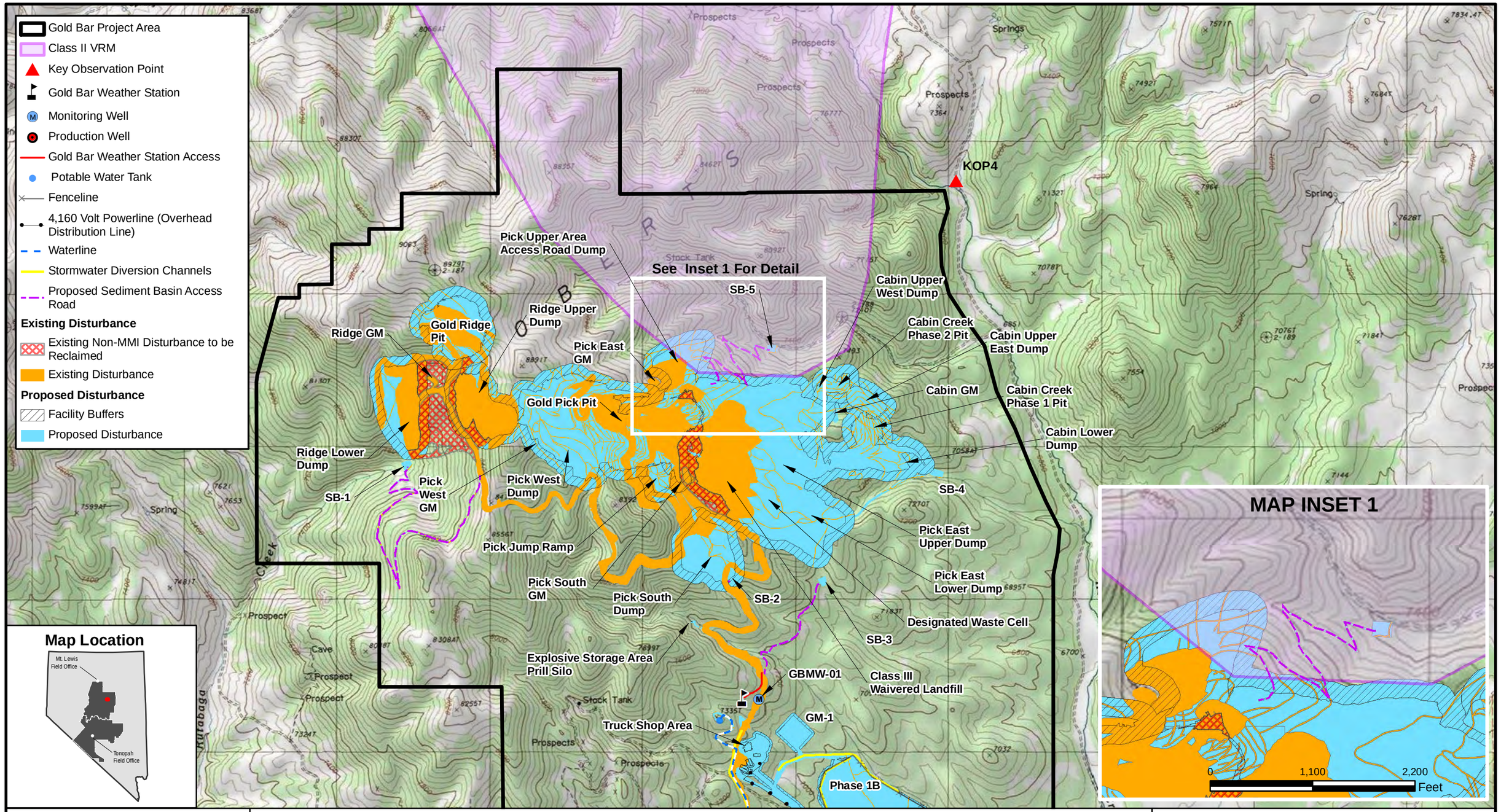
The Sediment Basin 5 would create a concave, rectangular form that would be somewhat indistinct as it would not extend above the elevation of the existing grade. It would create a soft, geometric line, with a light brown to tan color, and a smooth, uniform texture. The visual contrast from Sediment Basin 5 would be localized and moderate since it would add a different form, line, color, and texture element than is currently present in the VRM Class II area.

KOP 1 is the only KOP where an observer may have the potential to see the proposed disturbance within the VRM Class II area. A viewshed analysis was conducted on KOP 1, as well as three additional viewshed points along the road adjacent to Roberts Creek in order to determine if the proposed facilities within the VRM Class II area are visible from any of these locations (**Figure 4.18-2**). As shown on **Figure 4.18-2**, the proposed disturbance within the VRM Class II area is not visible from three of the four viewshed locations. Only a portion of the Pick Upper Area Access Road buffer would be visible from Viewshed Point 2 (**Figure 4.18-2**), and the disturbance is over one mile away from the Viewshed Point 2. The proposed disturbance would likely not be the major focus of the viewshed in that location, due to distance from the disturbance and the topography changes from the point to the disturbance area. As a result, the context of effect for disturbance within the VRM Class II is considered localized.

The form, line, color, and texture of the facilities that would be constructed within the VRM Class II area would result in a long-term, localized, moderate impact to the VRM Class II and would not be consistent with VRM Class II objectives. In the case of the WRDA, this impact would be long-term, since reclamation and revegetation would eventually reduce visual impacts. However, since the proposed disturbance within the VRM Class II area is not visible from most locations where observers may see it, the impact from the disturbance within the VRM Class II area would be localized, long-term, and minor in terms of actual visibility, and the scenic quality from viewsheds where the disturbance may be seen.

Dark Sky Resources

The operation of mining and processing facilities during nighttime hours would have a substantially different type of impact on visual resources than operation during the day. Most of the form, line, color, and texture elements of the Project and the existing landscape features would not be visible from the KOPs or elsewhere during the night. However, lights used on Project equipment and vehicles during nighttime operations, and use of stationary lights positioned at various locations within the Project area would be visible. Additionally, the proposed personnel parking area along Highway 50 would add stationary lights, which would add to the ambient light levels at night.



Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 2,000 4,000 Feet
1 in = 2,000 feet

N

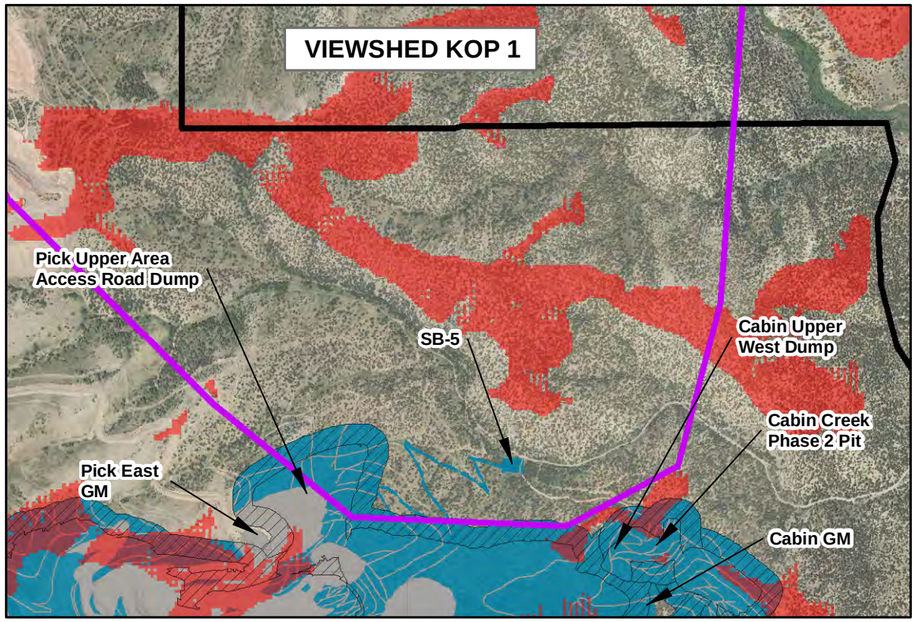
PROJECT DISTURBANCE WITHIN VRM CLASS II

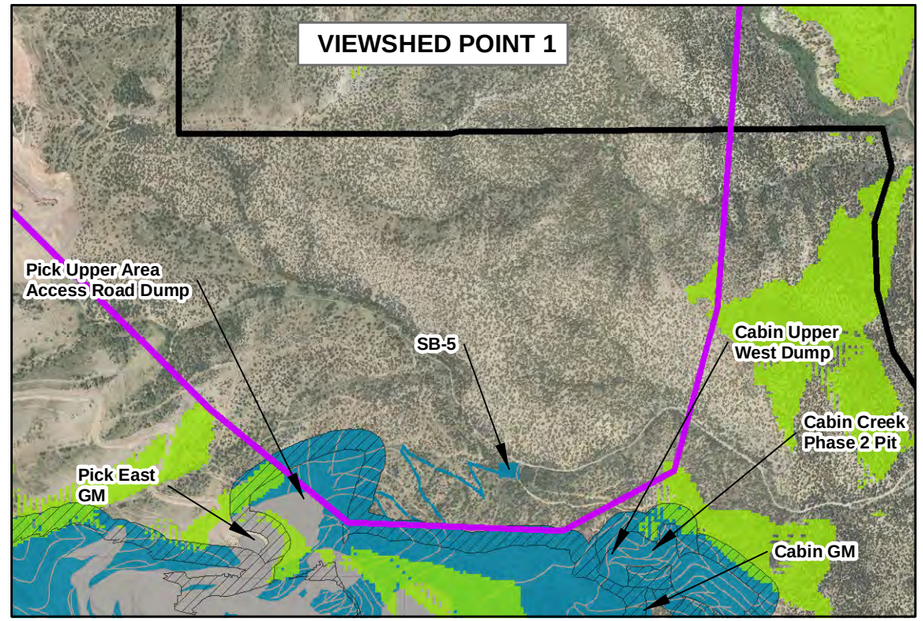
FIGURE 4.18-1

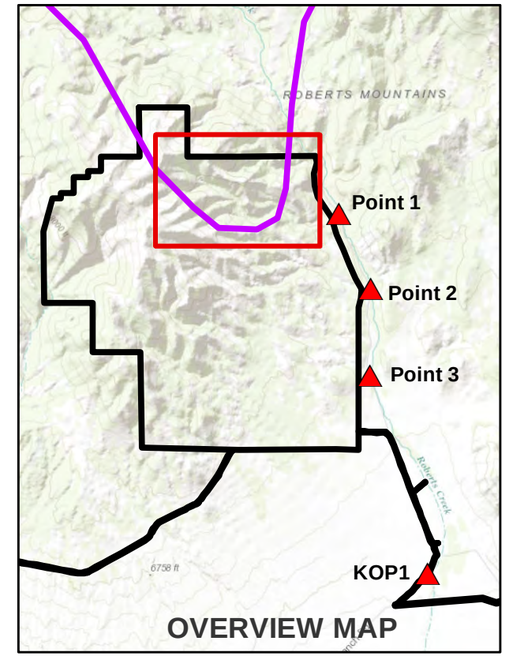
REVISION **A**

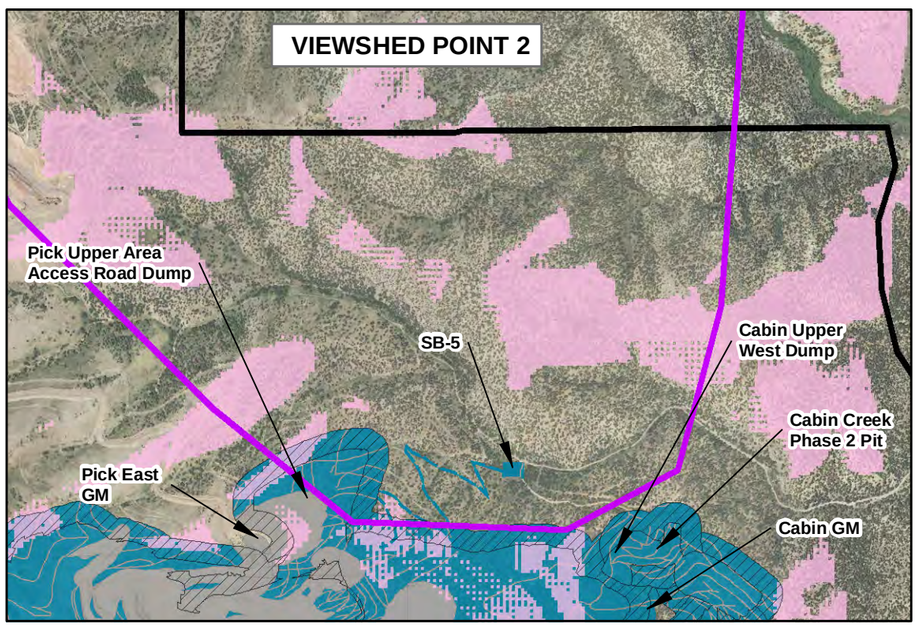
1/31/2017

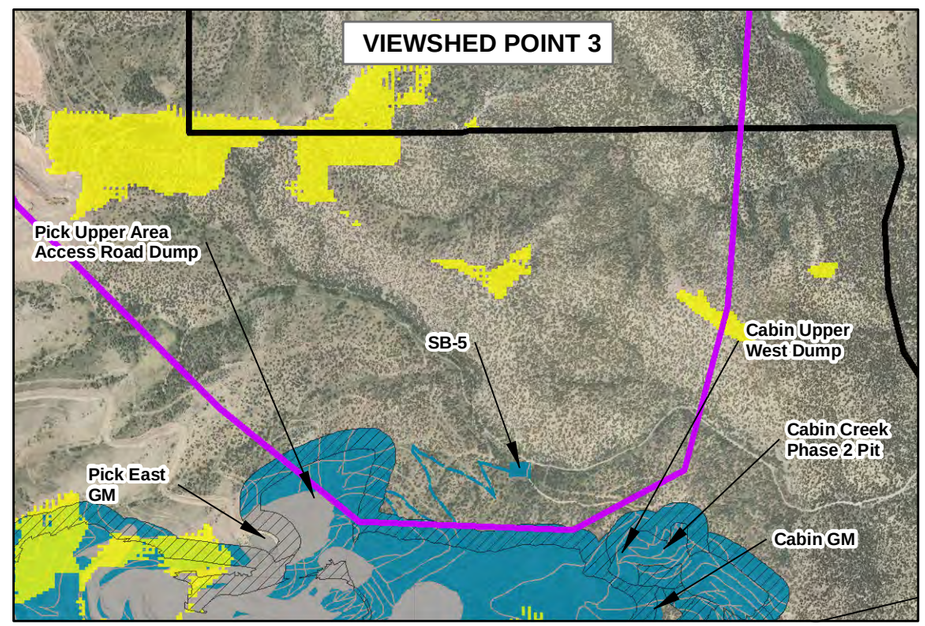
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.











- Gold Bar Project Area
- Key Observation Point
- Class II VRM
- Existing Disturbance

Proposed Disturbance

- Facility Buffers
- Proposed Disturbance

Viewsheds

- KOP 1 - Visible
- Viewshed Point 1 - Visible
- Viewshed Point 2 - Visible
- Viewshed Point 3 - Visible

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 1,500 3,000 Feet
1 in = 1,500 feet

N

CLASS II VRM VIEWSHEDS

FIGURE 4.18-2

REVISION **A**

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Use of Project lights would contribute to the illumination of night sky in an area that is largely uninhabited and unlit. The night sky over uninhabited, dark areas is optimal for viewing stars and constellations. As illumination of the night sky is increased over an uninhabited and dark area, the number of astral and stellar features that are visible from that area is reduced, and thus the night sky is adversely impacted. The Project would have short-term, regional, negligible impacts on night sky lighting because there are very few existing light sources in the area and the ambient light level is very low, and because the Project would introduce relatively few light sources to the area. Lighting added the proposed personnel parking area would be designed to prevent light pollution of areas adjacent to the parking area. Additionally, many of the lights required for the Project would consist of equipment and vehicle headlamps, which concentrate light towards the direction of travel rather than allowing light to escape in all directions, including upwards into the night sky.

Project lights would have a strong contrast against the black backdrop of the night when looking directly at them, as opposed to viewing the sky over them. Because there are very few existing lights sources in the area and the ambient light level is very low, any lights used for the Project would be surrounded by an otherwise dark, unlit background. The brightness of the lights and darkness of the black or nearly black background would create a strong contrast, and thus make the lights readily visible. Motorists travelling on U.S. Highway 50 would constitute the majority of observers in the area during night hours, and would notice the lights. The impact would be expected to be regional, short-term, and moderate for several minutes to passing motorists.

Use of the parking lot in the town of Eureka would include the installation of low-voltage lighting for employee safety. This would add illumination to the night sky and would adversely impact dark sky resources. The additional lighting associated with the parking area is anticipated to be short-term, regional, and minor.

4.18.2.1 Unavoidable Adverse Impacts

During construction and operation of the Project, unavoidable adverse impacts to visual resources would include the visibility of construction equipment and personnel, and possible fugitive dust emissions from disturbed areas within the Project area. Operation of the Project would require numerous Project facilities and equipment that would be visible from the KOPs and elsewhere along U.S. Highway 50 and the surrounding area. Visibility of these Project facilities and equipment would be unavoidable, as would the impact associated with the visual contrast they would have with the characteristic landscape. The degree of visual contrast associated with the Project would be reduced following reclamation, but would not be eliminated entirely. The added illumination from the lighting at the parking area would also be an unavoidable adverse impact.

4.18.2.2 Irreversible and Irretrievable Commitments of Resources

The contrasting form, line, color, and texture elements added to the landscape by the proposed mining pit would be an irreversible commitment of visual resources because the mine pit would not be reclaimed. Reclamation of some Project components, such as the growth medium stockpiles and the HLP would lessen the degree of contrast these components would have with the characteristic landscape, but not eliminate all contrast entirely.

4.18.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Implementation of the Proposed Action would require short-term uses of visual resources. Short-term uses would result from the Project components that would be reclaimed and have no meaningful contrast with the landscape afterwards. Long-term productivity of visual resources would be affected by Project components that are not reclaimed, such as the mine pit, and components that would remain readily apparent and contrast with the landscape despite reclamation, such as the HLP and WRDA.

4.18.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Under this alternative, the visual impacts from mining and processing facilities would be the same as described for the Proposed Action in Section 4.18.2.

The proposed overhead distribution line would consist of power poles and conductor wires spread between each pole. The power poles would add tall thin vertical form and line elements to the landscape. The poles would be brown to dark brown in color with a smooth texture. The conductor wires would add very thin curvilinear line elements that are light gray in color.

The distribution line would be visible from KOP 1: Northeasterly Viewing Angle, KOP 2: Northeasterly Viewing Angle, and KOP 2: Northwesterly Viewing Angle. The anticipated visual impact at each of these KOPs is described below. Impacts are assumed to be long-term, until reclamation is fully completed after removal of the poles and powerline.

KOP 1: Northeasterly Viewing Angle

The brown to dark brown power poles would have tall thin vertical form and line elements that are somewhat similar to the brown, very thin vertical form and line elements of existing fence posts in the foreground-middleground. The power poles would be much taller than the existing fence posts, which would make them more apparent and increase their visual contrast.

The curvilinear line elements that would be created by the overhead conductor wires would be repetitive of the curvilinear line formed at the edge of existing Roberts Creek Road. However, the road surface is brown, and there are no other curvilinear line elements in the landscape.

As described above, the distribution line would repeat some visual elements in the landscape, but not dominant or common elements. Thus, it is anticipated that the distribution line would have a regional and moderate degree of visual contrast from KOP 1: Northeasterly Viewing Angle. The distribution line would dominate the view and be a major focus of attention from the KOP. This level of change and impact would be consistent with the objectives of BLM VRM Class IV.

KOP 2: Northeasterly Viewing Angle

The vertical form and line elements that the proposed power poles would add to the landscape would be repetitive of the straight vertical line elements associated with existing fence posts in the foreground-middleground zone. The power poles would also be a similar shade of brown as

the fence posts. However, the power poles would be much taller than the existing fence posts, which would make them more apparent and increase their visual contrast. Visual contrast would also be increased because there are no existing curvilinear line elements in the characteristic landscape of KOP 2: Northeasterly Viewing Angle.

The visual contrast of the distribution line would be regional and moderate to high. The distribution line would dominate the view and be a major focus of attention from the KOP. According to the objectives of BLM VRM Class IV, activities may dominate the view and be the major focus of viewer attention. Thus, although the distribution line would have a moderate to high degree of contrast, it would be consistent with BLM VRM Class IV.

KOP 2: Northwesterly Viewing Angle

The thin vertical form and line elements of the power poles would be repetitive of the thin vertical form and line elements of an existing roadside sign in the foreground-middleground. However, there are no other thin vertical form and line elements in the characteristic landscape, and the power poles would be taller than the roadside sign posts.

The curvilinear line elements that would be created by the overhead conductor wires would be repetitive of the curvilinear line formed at the edge of existing Roberts Creek Road. However, the road surface is brown, and there are no other curvilinear line elements in the landscape.

Accordingly, it is anticipated that the visual contrast of the distribution line would be regional and moderate to high. The distribution line would dominate the view and be a major focus of attention from the KOP. According to the objectives of BLM VRM Class IV, activities may dominate the view and be the major focus of viewer attention. Thus, although the distribution line would have a moderate to high degree of contrast, it would be consistent with BLM VRM Class IV.

4.18.3.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts this alternative would be the same as described for the Proposed Action. Additionally, the 25 kV overhead distribution line would create adverse impacts to visual resources. Visibility of the distribution line would be unavoidable.

4.18.3.2 Irreversible and Irretrievable Commitments of Resources

The contrasting form, line, color, and texture elements added to the landscape by the proposed mining pit would be an irreversible commitment of visual resources because the mine pit would not be reclaimed. The distribution line would be fully reclaimed after closure of the Project so no additional irreversible commitment of resources would occur to visual resources under this alternative.

Reclamation of some Project components, such as the growth medium stockpiles, the HLP, and the distribution line would lessen the degree of contrast these components would have with the characteristic landscape, but not eliminate all contrast entirely.

4.18.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses of visual resources would result from the Project components that would be reclaimed and have no meaningful contrast with the landscape afterwards. Long-term productivity of visual resources would be affected by Project components that are not reclaimed, and components that would remain readily apparent and contrast with the landscape despite reclamation, such as the HLP, WRDA, and potentially areas around the removed pole sites.

4.18.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Under this alternative, the visual impacts from mining and processing facilities would be the same as described for the Proposed Action in Section 4.18.2. There would be no additional impacts expected.

4.18.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts of this alternative would be the same as described for the Proposed Action in Section 4.18.2.

4.18.4.2 Irreversible and Irretrievable Commitments of Resources

Implementation of this alternative would have the same irreversible and irretrievable commitment of resources as the Proposed Action. The contrasting form, line, color, and texture elements added to the landscape by the proposed mining pit would be an irreversible commitment of visual resources because the mine pit would not be reclaimed. Reclamation of some Project components, such as the growth medium stockpiles and the HLP would lessen the degree of contrast these components would have with the characteristic landscape, but not eliminate all contrast entirely.

4.18.4.3 Relationship of Short-Term Uses and Long-Term Productivity

Implementation of this alternative would have the same short-term use and long-term productivity of visual resources as the Proposed Action. Short-term uses would result from the Project components that would be reclaimed and have no meaningful contrast with the landscape afterwards. Long-term productivity of visual resources would be affected by Project components that are not reclaimed, such as the mine pit, and components that would remain readily apparent and contrast with the landscape despite reclamation, such as the HLP and WRDA.

4.18.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. Under this alternative, the visual impacts from mining and processing facilities would be the same as described for the Proposed Action in Section 4.18.2. No other impacts are expected.

4.18.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts of this alternative would be the same as described for the Proposed Action in Section 4.18.2.

4.18.5.2 Irreversible and Irretrievable Commitments of Resources

Implementation of this alternative would have the same irreversible and irretrievable commitment of resources as the Proposed Action.

4.18.5.3 Relationship of Short-Term Uses and Long-Term Productivity

Implementation of this alternative would have the same short-term use and long-term productivity of visual resources as the Proposed Action.

4.18.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. Exploration roads and drill pads would create linear and irregular shaped forms in the landscape. The color of the roads and drill pads would be very similar to and repeat the color of existing mine disturbance and road disturbance on the south side of the Roberts Mountains. Visual contrast would be anticipated to be localized and negligible and consistent with the BLM VRM Class IV objectives.

The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action). Without this reclamation, impacts to visual resources from this alternative are expected to be localized, minor and long-term.

4.19 Water Quality and Quantity

4.19.1 Indicators

Surface Water Impact Indicators

Indicators used to assess the potential environmental impacts to surface water resources include the following:

- A reduction in base flow to perennial streams;
- A reduction in flow to perennial springs;
- Degradation in stream or spring water quality that can be directly or indirectly linked to activities associated with the Project. These changes might include releases of hydrocarbons, chemicals, or process waters through spills, or loading of contaminants via leaching, or accelerated erosion or sedimentation caused by project activities; and
- Impacts to surface water rights resulting in potential loss of beneficial water use;
- Impacts to water related resources such as floodplains.

Groundwater Impact Indicators

Indicators used to assess potential environmental impacts to groundwater resources from the Project may include any of the following:

- Changes in groundwater levels in either the alluvial or bedrock groundwater aquifers of the HSA that would have the potential to affect other water rights holders' beneficial use of groundwater, or
- Degradation of groundwater quality in these aquifers resulting from project activities such that one or more water quality parameters would exceed Nevada or federal primary water quality standards or Nevada secondary, enforceable maximum contaminant levels to a degree that would render those waters unsuitable for other existing or potential beneficial uses.

Geochemistry Indicators

The proposed mining would result in four mine pits that would remain after cessation of mining along with 10 WRDAs and a single HLP in the southern part of the proposed plan boundary. Key geochemical indicators of potential impacts to the environment of Kobeh Valley would include the following:

- Formation of pit lakes in one or more of the proposed four mine pits. Water quality in these pit lakes may be an issue for wildlife as well as an issue for waters of the state in Nevada;
- Seepage from one or more of the proposed 10 WRDAs where water quality exceeded Nevada water quality standards; and

- Seepage from the post-mining HLP where water quality exceeded Nevada water quality standards.

Effect Context for Water Quality and Quantity
Localized: Effects would occur inside the Project area.

Regional: Effects would occur outside of the area of analysis to the larger region.

Duration of Effects Definitions for Water Quality and Quantity
Short-term: One day or less for water quality; one year or less for hydrologic conditions, with the hydrology returning to pre-disturbance condition the next year.

Long-term: Greater than one day for water quality; greater than one year for hydrologic conditions.

Intensity of Effects Definitions for Water Quality and Quantity
Negligible: Hydrology of the area would not be affected, or impacts would not be measurable. Any impacts on the hydrologic regime would be slight and short-term. Water quality would not be affected, or impacts would not be measurable and would not affect beneficial uses of receiving waters. Any impacts would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project.

Minor: Impacts on hydrology, such as an increase or decrease in surface or groundwater flow, would be detectable. Effects on water quality would be detectable and may affect beneficial uses of receiving waters. Effects would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project.

Moderate: Impacts on hydrology, such as an increase or decrease in surface or groundwater flow, would be readily apparent. Effects on water quality would be readily apparent and would affect beneficial uses of receiving waters. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary, but these measures would most likely be effective.

Major: Impacts on hydrology would be readily apparent and would substantially change the hydrologic regime of the area. Similarly, impacts on water quality would be readily apparent and would substantially change beneficial uses of surface or groundwater. EPMs and BMPs may be necessary to reduce adverse impacts, and these measures would need to be monitored to determine their effectiveness.

4.19.2 Direct and Indirect Impacts of the Proposed Action

Surface Water Impacts
There are no perennial streams or springs within the Plan boundary, Roberts Creek is an ephemeral stream near the proposed production water wells at the Roberts Creek Ranch. As summarized in Section 2.0 and discussed in detail in the Plan (MMI, 2016a), Section 2.5.4 Erosion and Sediment Control, MMI would use BMPs to control storm water, sediment erosion, and protect surface water resources from pollution related to mining and processing operations. In

addition, water drawdown associated with the Project would be limited to the alluvial aquifer in Kobeh Valley. Therefore, impacts to surface water resources within or adjacent to the Project are anticipated to be long-term, regional, but negligible.

Groundwater Impacts

SRK prepared an analysis and associated groundwater flow modeling to be used for simulation of the groundwater system and assessment of impacts from potential pumping activities (SRK, 2014b). The Proposed Action includes proposed water supply of alluvial groundwater from the area near the Roberts Creek Ranch (SRK, 2014b). Two wells, GBPW-210 and GBPW-211 would be used to pump an estimated average of 380 gpm of alluvial groundwater for the seven-year estimated life of mine. A maximum of 500 gpm may be pumped during the seven-year mining period. The location of the planned production wells along with monitoring well GBMW-04 and other wells in the Roberts Creek Ranch area are shown in **Figure 3.19-5**. The current estimated steady-state groundwater levels in the Roberts Creek Ranch area are shown in **Figure 4.19-1**.

The depth to groundwater in the area of the Roberts Creek Ranch is around 190 feet bgs (SRK, 2014b). The two production wells would supply 380 to 500 gpm of groundwater to the Project for use in mining would be screened at depths greater than 400 feet bgs in an alluvial aquifer that is approximately 800 to 1,000 feet thick (SRK, 2014b).

Under scenario one, which would be pumping an average of 380 gpm of alluvial groundwater for 10 years (three years longer than actual mining operations would occur), the 10-foot drawdown isopleth would extend up to 1.4 miles from the pumping wells GBPW 210 and 211, as shown in **Figur**e **4.19-2**. Drawdown near the Roberts Creek Ranch well would be around 15 to 20 feet. Under scenario two, which would be pumping of 500 gpm for 10 years, the 10-foot drawdown isopleth would extend up to 2.0 miles from the pumping wells and drawdown at the Roberts Creek Ranch well would be around 25 feet, as shown in **Figure 4.19-3**. Numerical calibration and simulation of groundwater flow and delineation of a drawdown isopleth of one foot cannot be performed, with any degree of confidence, due to the scale of the model domain, the inherent variability associated with conceptual model development, and the resulting uncertainty with numerical model predictions. Water levels in unconfined alluvial aquifers throughout Nevada are variable (spatially and temporally) and can naturally fluctuate five to 10 feet in response to precipitation events, changing seasons and changing weather patterns, cycles, and trends (climate). Therefore, drawdown of less than 10 feet can also be attributed to natural variability in the hydrologic cycle. Thus, 10 feet was selected as lower limit for impact assessment. Modeling was completed by SRK (2014b) using MODFLOW-SURFACT (Hydrogeologic, 2006) and calibration was in accordance with ASTM D5447-04 (2010). Calibration was conducted to water levels in monitoring wells and also to pumping tests conducted by SRK.

N

FIGURE 4.19-1

REVISION

A

Scenario 1: 10-foot drawdown contours show a lowering of the water table after 10 years of simulated pumping at 380 gallons per minute from the two wells

Gold Bar Process Road

North Roberts Creek Road (NVN-52399)

GBPW-210

GBPW-211

40

30

20

10

NVN-91566

Mount Hope Wellfield Road

Roberts Creek Road

Roberts Creek

Stock Tank

Stock Tanks

Prospects

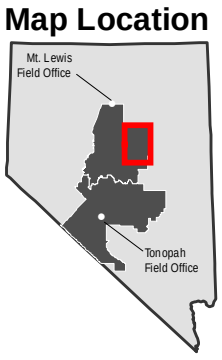
Spring

Seventyfive

Roberts Creek Ranch Corral

OLD PONY EXPRESS TRAIL

Map Location



Gold Bar Project Area

25 kV Overhead Distribution Line Alternative

Mount Hope and North Roberts Creek Road Alternative

Production Well

Predicted Drawdown in Water Table Contours (feet)

Proposed Facilities

Data obtained from SRK Consulting. Information is current as of September 24, 2015.

Land Status

BLM

Private

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 2,000 4,000 Feet

1 in = 2,000 feet

N

PREDICTED CHANGES IN WATER TABLE AT THE END OF 10 YEARS PUMPING FROM PRODUCTION WELLS (SCENARIO 1 - 380 GPM)

FIGURE 4.19-2

REVISION NO. **A**

1/31/2017

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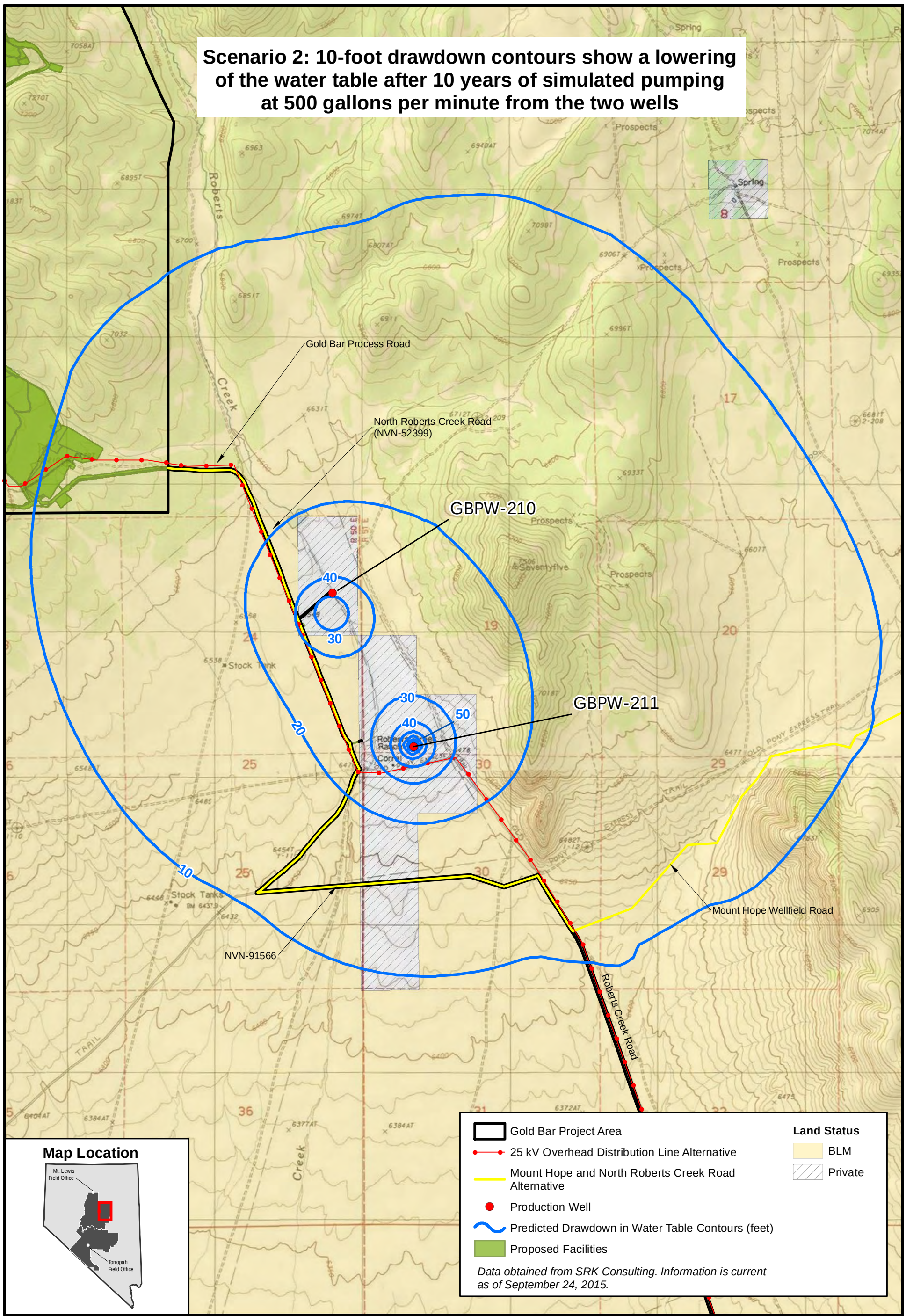

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 2,000 4,000 Feet
1 in = 2,000 feet

N

PREDICTED CHANGES IN WATER TABLE AT THE END OF 10 YEARS PUMPING FROM PRODUCTION WELLS (SCENARIO 2 - 500 GPM)

FIGURE 4.19-3

REVISION NO. **A**

1/31/2017

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Only the Roberts Creek Ranch well would be impacted by the pumping of production water from the alluvial aquifer near the Roberts Creek Ranch. The Roberts Creek Ranch well is at a depth of 190 feet and is screened in alluvial material. Pumping the Roberts Creek Ranch well simultaneously with MMI wells would not result in additive drawdown due to the very small domestic pumping capacity of this well. No springs or seeps would be impacted. Groundwater in the vicinity of Roberts Creek is at a depth of approximately 190 feet bgs. Thus Roberts Creek is not connected to groundwater in the area of the proposed pumping wells and would, therefore, not be affected by pumping of alluvial groundwater in the Roberts Creek Ranch area (SRK, 2014b). Ninety-nine percent recovery of ground water levels are expected within two years after cessation of pumping (SRK, 2014b). Impacts to groundwater are anticipated to be long-term, regional, and minor.

Geochemistry Impacts

Potential environmental impacts related to geochemistry and water quality associated with mining and processing facilities would include: (1) the four proposed mine pits; (2) the nine proposed WRDAs; and (3) the proposed HLP facility to be used for leaching of oxide ore.

Mine Pits

The proposed four mine pits would involve disturbance of 142 acres, which includes existing disturbance, and would have pit bottoms ranging in elevation from 6,890 feet amsl to 8,190 feet amsl. All proposed pit bottoms would be a minimum 130 feet above the regional groundwater table (**Table 2.2-4**). No pit dewatering is planned by MMI during mining (MMI, 2016a). Consequently, no post-mining pit lakes are expected in any of the four proposed mine pits. During periods of heavy rainfall, small ponds of water may form in the pit bottoms. These ponds would quickly evaporate or infiltrate once the rainfall ceases. Therefore, impacts associated with the four mine pits that would remain on site after the cessation of mining are anticipated to be long-term, regional, and negligible.

Waste Rock Disposal Areas

The Proposed Action calls for nine WRDAs totaling 351 acres (including the Pick East Upper Access Road) and containing 72 million cubic yards of waste rock (MMI, 2016a). Waste rock characterization was completed for the Project by SRK (2014b). These test results showed that approximately 90 percent of the waste rock expected to be generated from the four mine pits at Gold Bar would be non-acid generating and have excess neutralization capacity because of the carbonate-rich sedimentary rock that would compose the great majority of waste rock. This waste rock was termed Non-Designated waste rock by SRK (2014b). Although this type of waste rock is non-acid generating, the MWMP and HCT tests showed that the Non-Designated waste rock has the ability to leach arsenic, antimony, and thallium above NDEP reference standards.

Approximately 10 percent of the waste rock to be generated by the Project would consist of unoxidized sulfide-bearing carbonaceous and decalcified limestone. This waste rock is potentially acid generating and was termed Designated waste rock by SRK (2014b). This Designated waste rock would come mainly from the Gold Pick pit and be disposed of in a separate WRDA – the Pick East Lower (PEL) WRDA (MMI, 2014). This type of waste rock is capable of leaching the

following metals at concentrations above NDEP reference values, based on MWMP and HCT tests: aluminum, antimony, arsenic, beryllium, cadmium, chromium, fluoride, iron, lead, magnesium, manganese, nickel, sulfate, and thallium. This Designated waste would total approximately 6.7 million tons.

SRK (2013b) completed infiltration and draindown studies for the Project to estimate the thickness of cover needed for WRDAs and the HLP as well as to estimate the draindown rate of the HLP post-mining. This study showed that, with no cover, waste rock in the WRDAs and spent ore in the HLP would allow approximately 19 percent of rainfall to percolate into the waste rock or spent ore material and potentially generate seepage. With a one-foot thick compacted soil cover, the infiltration rate would be around 11 percent of precipitation and with a two-foot soil cover, the infiltration would drop to eight percent of precipitation. In terms of flux rates, with no cover, the WRDA or HLP would have a stabilized seepage rate of 16.97 gpm after 10 years; with a two-foot cover, the stabilized seepage rate would be reached at 18 years and the seepage rate would be around 7.15 gpm. The WRDAs would be sloped and graded to average slopes ranging from 2H:1V to 3.8H:1V, covered with 12 inches of growth media, and revegetated during reclamation. The reclamation plan has been integrated with the mine plan to allow concurrent reclamation of portions of the waste rock dumps that have been completed.

MMI (2014) presented a proposed waste rock management plan for the Project. The Non-Designated waste rock would be placed in one of the nine WRDAs developed for this type of waste, used for infrastructure foundations, road fill, or reclamation purposes, or used as pit backfill in the North Cabin Creek pit or the South Gold Ridge pit. The WRDAs would be sloped and graded to average slopes ranging from 2H:1V to 3.8H:1V, covered with 12 inches of growth media, and revegetated during reclamation. Most of the Non-Designated waste WRDAs would be valley fill structures. Storm water diversion structures would be used to control and divert storm water away from the WRDAs.

The Designated waste would be placed in the PEL WRDA. This facility would be a constructed basin buttressed by Non-Designated waste and surrounded by a downgradient berm constructed of Non-Designated waste (MMI, 2014). The facility would be graded to slopes of 2H:1V and covered with an amended soil using bentonite that would be approximately 30 acres in size and used to minimize meteoric infiltration. This WRDA would also have storm water diversion channels upgradient to divert storm water away from the facility.

The infiltration modeling by SRK (2013b) discussed above suggests that the Non-Designated waste WRDAs with only six inches of soil cover would have the potential for infiltration of rainfall during prolonged periods of heavy rain. This infiltration of precipitation could lead to temporary local seepage from the base of the WRDAs with elevated arsenic, antimony, and thallium at levels above NDEP reference values. However, this seepage would be limited in volume, would be expected to evaporate, and would not be anticipated to reach groundwater around the Project area. Impacts are anticipated to be long-term, localized, and negligible.

The designated waste WRDA (PEL) would have an amended soil cover with bentonite that would minimize infiltration of rain water. If this cover has sufficient thickness, sufficient bentonite, and is compacted and graded with five percent slopes to allow for runoff of precipitation, then infiltration of precipitation into the PEL WRDA would be substantially reduced and seepage would be unlikely during heavy rain events. Should seepage occur, the construction of the PEL WRDA in a basin buttressed by Non-Designated waste and surrounded by a berm of Non-Designated waste should allow for neutralization of any seepage and precipitation of metals in the seepage. Any such seepage event would be very local in nature, short-lived, and the seepage would evaporate soon after cessation of the rain event. Impacts are anticipated to be long-term, regional, and negligible.

Heap Leach Pad

The Proposed Action calls for a single HLP to be constructed in the southern part of the Plan boundary (Section 2.0). This facility would encompass 106 acres and be designed in accordance with NAC 445A; it would have an engineered liner and leak detection system (Section 2.0). The facility would be a zero discharge facility. Two monitoring wells would surround the facility, with one monitoring well upgradient (GBMW-01) and one monitoring well downgradient (GBMW-03) to monitor for potential groundwater impacts from the facility (MMI, 2016a). Approximately 17 million tons of oxide ore would be leached in the facility. A storm water diversion would be constructed upgradient of the HLP to divert storm water around the facility. The diversion channel would be constructed to handle the 100 year 24-hour storm. A seismic stability analysis has shown that the facility design should be stable under expected seismic conditions in the Project area (MMI, 2016a). During operations, fluids draining from the HLP would report to process ponds.

When mining is complete and leaching of the ore is finished, the HLP would be allowed to drain freely with no rinsing. The draindown fluids would report to the process water ponds converted to evaporation ponds to contain and evaporate the draindown fluids. These draindown fluids would potentially contain arsenic, antimony, thallium, and mercury in exceedance of NDEP reference values (SRK, 2013b). Recirculation of the draindown fluids through the HLP would be used until sufficient draindown has occurred to allow for collection and evaporation of the fluids in the evaporation ponds. The HLP would be sloped and graded to an average slope of 3H:1V and would be covered with three feet of growth media and revegetated. The final design of the reclamation would be submitted to the BLM for approval two years prior to reclamation and closure of the facility.

Environmental impacts from the HLP during operation are anticipated to be long-term, regional, and negligible. because it would be designed as a zero discharge facility in accordance with NAC guidelines. Following closure and reclamation, any seepage that may occur during extreme rainfall events would be collected and evaporated, thus eliminating potential impacts to surface water quality or groundwater quality. The two monitoring wells that surround the facility would be monitored to ensure no impacts to groundwater beyond the Plan boundaries.

Parking Area

The parking lot within the town of Eureka is surfaced with compacted gravel, which reduces erosion of the underlying soils. Since the lot is existing, it is not anticipated that the lot would result

in a substantial increase in stormwater runoff. Use of the parking lot is anticipated to have a long-term, regional, and negligible impact on water resources.

4.19.2.1 Unavoidable Adverse Impacts

Surface Water Impacts

There would be no unavoidable adverse impacts to surface water resources from the Proposed Action.

Groundwater Impacts

There would be no unavoidable adverse impacts to groundwater resources from the Proposed Action.

Geochemistry Impacts

No unavoidable adverse geochemical or water quality impacts are expected from the Proposed Action. Pit bottoms would be above the regional water table, eliminating the possibility of post-mining pit lakes. The Non-Designated WRDAs would have a cover of growth media and be revegetated. There is a possibility of seepage from these WRDAs during prolonged heavy rain events when the mine is in operation and the WRDAs are being used for disposal of waste rock, but the seepage would be short-lived and would evaporate quickly after cessation of the rain. The Designated waste WRDA (PEL) would have a two-foot thick amended soil cover to substantially reduce the potential for infiltration of rainfall. Similarly, the HLP would be capped to minimize infiltration of precipitation and any seepage from the HLP would be collected and evaporated. Overall, no unavoidable adverse impacts are expected.

4.19.2.2 Irreversible and Irretrievable Commitments of Resources

Surface Water Impacts

There would be no irreversible or irretrievable impacts to surface water resources from the Proposed Action. The potential loss of watershed area for runoff to ephemeral streams would be minimal and be mainly due to the remaining four mine pits. The WRDAs would be reclaimed to enhance runoff and thus would not likely affect the watershed area for runoff.

Groundwater Impacts

There would be no irreversible or irretrievable impacts to groundwater resources from the Proposed Action. Groundwater levels in the alluvium used for production water would return to 99 percent recovery of groundwater levels within two years after cessation of pumping (SRK, 2014b). The mine pits would all have pit bottoms above the water table in the bedrock, and thus would not affect groundwater levels.

Geochemistry Impacts

Mining and processing would generate 10 WRDA, four open pits, and one HLP that would remain after cessation of mining. From a geochemical standpoint, these post-mining features would not constitute an irreversible or irretrievable commitment of resources.

4.19.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Surface Water Impacts

There would be no anticipated impacts to the short-term or long-term use of surface water in Kobeh Valley from the Proposed Action.

Groundwater Impacts

There would be a short-term impact to groundwater use by the Roberts Creek Ranch well due to the estimated drawdown of 15 to 25 feet at the well after seven years of pumping by production wells GBPW 210 and 211. The rapid recovery of the groundwater level after the cessation of pumping would negate any long-term impact to groundwater use by the Roberts Creek Ranch well (SRK, 2014b).

Geochemistry

From a geochemical standpoint, productivity refers to the ability to use the Project area for future access to minerals or metals of potential value. The 10 WRDFs and the HLP would slightly reduce potential future access to minerals within the Project boundary. Thus, these permanent post-mining facilities may pose some limited impact to future short-term and long-term productivity of the Project area because their presence may limit access to minerals or metals of future value.

4.19.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Surface Water Impacts

Potential impacts to surface water would be similar to the Proposed Action. Similar to the Proposed Action and as discussed in Section 2.0, use of BMPs to control sediment and storm water runoff would reduce impacts to surface water.

Groundwater Impacts

Impacts to groundwater under this alternative are the same as those described under the Proposed Action.

Geochemistry Impacts

Impacts to geochemistry under this alternative are the same as those described under the Proposed Action.

4.19.3.1 Unavoidable Adverse Impacts

There would be no unavoidable adverse impacts to surface water or groundwater from this alternative. Unavoidable adverse impacts to geochemistry would be the same as the Proposed Action.

4.19.3.2 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible or irretrievable commitments of surface water, or groundwater resources from this alternative. Irreversible and irretrievable commitments of geochemistry would be the same as the Proposed Action.

4.19.3.3 Relationship of Short-Term Uses and Long-Term Productivity

There would be no anticipated impacts to the short-term or long-term use of surface water or groundwater resources in Kobeh Valley from this alternative. Relationship of short-term uses and long-term productivity for geochemistry would be the same as the Proposed Action.

4.19.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Surface Water Impacts

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells.

Groundwater Impacts

Impacts to groundwater under this alternative are the same as those described under the Proposed Action.

Geochemistry Impacts

Impacts to geochemistry under this alternative are the same as those described under the Proposed Action.

4.19.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts to geochemistry would be the same as the Proposed Action.

4.19.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of geochemistry would be the same as the Proposed Action.

4.19.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term and long-term productivity for geochemistry would be the same as the Proposed Action.

4.19.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Surface Water Impacts

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access.

Impacts to surface water under this alternative are the same as those described under the Proposed Action. As discussed in Section 2.0 and under the Proposed Action, sediment controls and storm water control would be used to protect Roberts Creek.

Groundwater Impacts

Impacts to groundwater under this alternative are the same as those described under the Proposed Action.

Geochemistry

Impacts to geochemistry under this alternative are the same as those described under the Proposed Action.

4.19.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts to geochemistry would be the same as the Proposed Action.

4.19.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of geochemistry would be the same as the Proposed Action.

4.19.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term and long-term productivity for geochemistry would be the same as the Proposed Action.

4.19.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action). Erosion and sedimentation may continue to occur on areas that are not reclaimed which may have an impact to surface water quality. Impacts to water quality from this alternative are expected to be long-term, regional, and negligible.

4.20 Wetlands and Riparian Zones

4.20.1 Indicators

Potential impacts to surface water, springs, and groundwater are discussed in Section 4.19. Note that because of the interconnection, impacts to groundwater may result in impacts to wetlands and riparian areas; similarly, impacts to surface water, including wetlands and riparian areas, may in turn product impacts to shallow groundwater.

Indicators used to assess the potential impacts to wetland and riparian resources include the following:

- Changes in acres of delineated wetlands and wetland boundaries;
- Changes in volume and iteming of flow produced by wetlands;
- Degradation of a wetland as a result of sediment discharged into receiving waters;
- Degradation of aquatic or riparian habitat in such a manner that is no longer supports sensitive resources;
- Changes to the biotic community;
- Substantial alteration to the existing drainage pattern and runoff from the site or area;
- Changes in width and length of riparian corridors; and
- Changes to the Project frequency, extent, and duration of flooding for riparian areas.

Effect Context for Wetlands and Riparian Zones

Localized: Effects would occur to wetland or riparian zones inside the Project area.

Regional: Effects would occur to wetland or riparian zones outside of the area of analysis to the larger region.

Duration of Effects Definitions for Wetlands and Riparian Zones

Short-term: One day or less for water quality; one year or less for wetland and riparian resources.

Long-term: Greater than one day for water quality; greater than one year for wetland and riparian resources.

Intensity of Effects Definitions for Wetlands and Riparian Zones

Negligible: The wetland and riparian resources within the area would not be affected, or impacts would not be measurable. Any impacts on the wetland and riparian resources would be slight and short-term. Chemical, physical, or biological changes to water quality would not be affected, or impacts would not be measurable and would not affect the health of the aquatic resources. Any effects would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project.

Minor: Impacts on wetland and riparian resources, such as an increase or decrease in surface flow, loss of wetland acres, or changes in wetland vegetation would be detectable. Chemical, physical, or biological changes to water quality would be detectable. Effects would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project.

Moderate: Impacts on wetland and riparian resources would result in detectable effects. These changes would not be permanent, and the resource would rebound to pre-impact conditions after one season. Chemical, physical, or biological changes to water quality would be detectable, but the desired water quality conditions would only be temporarily degraded. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary, but these measures would most likely be effective.

Major: Effects on wetlands and riparian areas would be readily apparent and would substantially change the functional value of the wetland and riparian areas in the context of the Project area or region. Impacts on wetland and riparian resources would result in detectable effects which would likely result in long-term to permanent changes and would impact associated resources such as the biotic community, water quality, water availability, and habitat quality. In extreme cases, biologics may be extirpated from the area due to loss of habitat. Chemical, physical, and biological changes to water quality would represent a significant degradation from the historic baseline water quality conditions. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary to reduce adverse impacts, and these measures would need to be monitored to determine their effectiveness.

4.20.2 Direct and Indirect Impacts of the Proposed Action

There are no wetlands or riparian habitat within the Plan boundary; therefore, there would be no impacts to these resources as a result of the Proposed Action. Approximately three acres of delineated wetland and 41 acres of mapped riparian habitat within the area of analysis for the Proposed Action would not be impacted because no surface disturbance is planned within these areas (**Figure 4.20-1**).

North Roberts Creek Road would intersect a portion of Roberts Creek that is located on private ranch land. At this point of Roberts Creek, the channel has been altered to supply irrigation to agricultural fields. The road would cross the existing agricultural fields; therefore, there would be no impacts, direct or indirect, to wetland and riparian resources as a result of this road. The impacts would be regional, negligible, and long term.

Water for the Project would be supplied via two groundwater production well(s) located on the Roberts Creek Ranch. Roberts Creek, an ephemeral drainage, flows through the ranch and supports riparian habitat in portions of its upgradient reaches. SRK prepared an analysis and associated groundwater flow modeling to be used for simulation of the groundwater system and assessment of impacts from potential pumping activities (SRK, 2014b). Groundwater modeling of the proposed wells near the ranch predict that the 10-foot drawdown contour for the proposed 10 years of pumping 500 gpm would have a maximum extent of two miles around the wells (**Figure 4.20-1**). Drawdown at the Roberts Creek Ranch well would be around 25 feet. The analyses provided generally indicates that impacts to the alluvial aquifer from pumping at the proposed production wells do not appear to be significant in terms of appreciably lowering of water levels in the area. The saturated alluvium is hundreds of feet thick, and the simulated extent of the 10-foot drawdown contour after a 10-year period of pumping is relatively limited (SRK, 2014b).

There are no wetlands located within the 10-foot drawdown contour for either scenario. The contours do overlap areas within Roberts Creek that are mapped as dry meadow and willow. Both these areas support some riparian vegetation. Since these areas are upgradient of the production wells and are supported by headwaters located outside of areas impacted by the predicted pumping drawdown from the Proposed Action, negligible, long-term, regional indirect impacts to wetland and riparian resources would occur as a result of the production wells.

Use of the parking lot in the town of Eureka would have negligible impacts on the wetlands and riparian areas since no wetlands or riparian areas occur within the parking area.

4.20.2.1 Unavoidable Adverse Impacts

There would be no unavoidable adverse impacts to wetland and riparian resources as a result of the Proposed Action.

4.20.2.2 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitments to wetland and riparian resources as a result of the Proposed Action.

4.20.2.3 Relationship of Short-Term Uses and Long-Term Productivity

The analysis shows that negligible long-term impacts would occur to wetland and riparian resources as a result of the Proposed Action. Short-term uses of groundwater via production wells would result in limited long-term groundwater drawdown; however, the riparian habitat within the predicated drawdown area is expected to show regional, long-term, negligible impacts as it is in an area supported by upgradient seeps and springs.

4.20.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

There are no wetland or riparian resources identified within this alternative; therefore, impacts to wetland and riparian resources would be the same as for the Proposed Action. Impacts to wetland and riparian resources would be regional, negligible, and long term.

4.20.3.1 Unavoidable Adverse Impacts

There would be no unavoidable adverse impacts to wetland and riparian resources as a result of this alternative.

4.20.3.2 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitments to wetland and riparian resources as a result of this alternative.

4.20.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The analysis shows that there would be no change in the relationship of short-term uses and long-term productivity as a result of this alternative.

Figure 4.20-1 Wetland and Riparian Resources Direct and Indirect Impacts

4.20.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. The impacts as a result of this alterative are the same as described for the Proposed Action because Three Bars Road and Atlas Haul Road were included in the Proposed Action analysis; therefore, impacts to wetland and riparian resources as a result of this alternative would be regional, negligible, and long term.

4.20.4.1 Unavoidable Adverse Impacts

There would be no unavoidable adverse impacts to wetland and riparian resources as a result of this alternative.

4.20.4.2 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitments to wetland and riparian resources as a result of this alternative.

4.20.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The analysis shows that there would be no change in the relationship of short-term uses and long-term productivity as a result of this alternative.

4.20.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. There are no identified wetland or riparian areas along Mount Hope road alignments. Any impacts to wetland or riparian areas as a result of actions associated with the Mount Hope Project have been analyzed under previous NEPA (BLM, 2012a). The impacts as a result of this alterative are the same as described for the Proposed Action; therefore, impacts to wetland and riparian resources as a result of this alternative would be regional, negligible, and long term.

4.20.5.1 Unavoidable Adverse Impacts

There would be no unavoidable adverse impacts to wetland and riparian resources as a result of this alternative.

4.20.5.2 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitments to wetland and riparian resources as a result of this alternative.

4.20.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The analysis shows that there would be no change in the relationship of short-term uses and long-term productivity as a result of this alternative.

4.20.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities described in in Section 2.2.14. There are no wetlands or riparian areas within the Notice-Level activities, so there would be no direct or indirect impacts to wetland and riparian resources from this alternative, so impacts are assumed to be regional, long-term, and negligible.

4.21 Wildlife

4.21.1 Indicators

Indicators for significant effects to wildlife resources focus on the loss or alteration of native habitats, increased habitat fragmentation, animal displacement, and direct loss of wildlife. Specifically, impacts from the Proposed Action or alternatives would be evaluated by considering if the Project would result in:

- Impacts to nesting raptors or other bird species protected under the MBTA from the loss of an active nest site caused by new facility construction during the breeding season;
- Impacts to naturally occurring seeps, springs, creeks, and meadows in and near the study area from either direct disturbance or indirect effects from the proposed disturbance activities that reduce the availability or quality or water;
- Increased noise levels from vehicular traffic and proposed operations greater than 10 dB(A) above ambient sound levels at least 0.25 miles from active or pending greater sage-grouse breeding habitat (leks) between two hours pre and post sunrise/sunset (BLM, 2015h);
- Acute or chronic toxicity resulting from exposure to toxic materials in the HLFs; and/or
- Impacts to special status species, including direct and indirect disturbance to federally threatened or endangered species or their critical habitat, or disturbance to federal candidate or BLM sensitive species that would contribute to their being listed as either federally threatened or endangered.

Effect Context for Wildlife

Localized: Impacts are confined to a small part of the population, habitat, or range.

Regional: Impacts would affect a widespread area of suitable habitat, or a large part of the population or range of a species.

Duration of Effects Definitions for Wildlife

Short-term: One year or less for individual or habitat; five years or less for a population.

Long-term: Greater than one year for individual or habitat; greater than five years for a population.

Intensity of Effects Definitions for Wildlife

Negligible: Wildlife would not be affected, or effects would not result in a loss of individuals or habitat. Effects on habitat would not be perceptible or measurable.

Minor: Effects on wildlife would be measurable or perceptible and localized; however, the overall viability of the population or subpopulation would not be affected, and the population would recover. Impacts on wildlife or wildlife habitat would be detectable. Effects would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project.

Moderate: Effects would be sufficient to cause a change in the population or subpopulation (e.g., abundance, distribution, quantity, or viability); however, the effect would remain localized. The change would be measurable and perceptible, but the negative effects could be reversed. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary, but these measures would most likely be effective.

Major: Effects would be substantial, highly noticeable, and could be permanent in their effect on population or subpopulation survival without active management. Mitigation beyond the applicant-committed EPMs and BMPs may be necessary to reduce adverse impacts, and these measures would need to be monitored to determine their effectiveness.

Effect Context for Special Status Species

Localized: Impacts are confined to a small part of the population, habitat, or range

Regional: Impacts would affect a widespread area of suitable habitat or the range of the population or species

Duration of Effects Definitions for Special Status Species

Short- term: One year or less for individual or habitat; five years or less for a population.

Long- term: Greater than one year for individual or habitat; greater than five years for a population

Effect Intensity Level Definitions for Special Status Species

No Impact: The Project is outside suitable habitat and there would be no disturbance or other direct or indirect impacts on the species. The action would not affect special status species or known habitat for special status species.

May Affect, Not Likely to Adversely Affect: The Project occurs in suitable habitat or results in indirect impacts on the species, but the impact on the species is likely to be entirely beneficial, discountable, or insignificant. The action may pose impacts on special status species or known habitat, but effects would be minimized with implementation of applicant-committed EPMs, BMPs, and reclamation of the Project. Insignificant impacts would not result in take. Discountable impacts are those that are extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant impacts or (2) expect discountable impacts on occur.

May Affect, Likely to Adversely Affect: The Project would have an adverse impact on a special status species as a result of direct, indirect, interrelated, or interdependent actions. An adverse impact on a listed species may occur as a direct or indirect result of the Project or its interrelated or interdependent actions and the impact is not: discountable, insignificant, or beneficial.

4.21.2 Direct and Indirect Impacts of the Proposed Action

The categories of wildlife described below inhabit and/or forage within the Plan boundary. Impacts to these species would be similar for all the Project features regardless of the specific element, with the exception of mine facility locations relative to wildlife movement corridors and/or other important wildlife habitats.

The potential impacts of the Proposed Action on terrestrial wildlife can be classified as short and long term. Short-term impacts arise from habitat removal and disturbance of primarily herbaceous vegetation, as well as from non-habitat removing activities (e.g., noise) associated with the Project. Long-term impacts consist of habitat removal and disturbance of tree or shrub-dominated vegetation and the wildlife populations that depend on those habitats, irrespective of reclamation success. Direct impacts to wildlife populations could include limited direct mortalities from construction vehicle-related mortalities, habitat loss or alteration, incremental habitat fragmentation, and animal displacement. Indirect impacts could result from increased noise and additional human presence. Habitat loss or alteration would result in direct losses of smaller, less mobile wildlife species (e.g., small mammals and reptiles) and the displacement of more mobile species into adjacent habitats. Displacement could result in some local reductions in wildlife populations if adjacent habitats are at carrying capacity. Project-related surface disturbance also would result in an incremental increase in habitat fragmentation at the mine site until vegetation has been re-established. **Table 4.17-1** shows the approximate acres of disturbance to vegetation communities from mining and processing facilities.

General Impacts of Construction and Operation

Construction of the Proposed Action would disturb three types of wildlife habitat; curl-leaf mountain mahogany (167 acres), pinyon-juniper woodland (482 acres), and sagebrush steppe (20 acres). Together, these communities make up the majority of the available habitat within the Plan boundary. Land–clearing activities would remove habitat; result in mortality from trampling or crushing; increase noise levels due to heavy equipment operation; and increase vehicular and human presence along roads and in land clearing areas. Many of the wildlife species that inhabit

the Plan boundary are mobile and would likely vacate construction areas and use other adjacent habitat. Species that are slow moving or that tend to retreat underground would be directly affected by construction. The increased human activity and noise associated with construction and operation activities would likely cause wildlife to temporarily avoid the area and displace into adjacent, undisturbed suitable habitat causing increased competition for resources. The increased pressure on habitat and wildlife species could affect individuals of a population including survival, growth, and reproduction. The potential effects of noise depend on the spatial relationship between a noise source and noise-sensitive receptors. Noise-generating activities associated with the Proposed Action include earthmoving, equipment operation, blasting, and vehicular traffic. Increased vehicular traffic associated also has the potential to cause an increase in wildlife-vehicle collisions and result in direct mortality to wildlife.

The parking area in the town of Eureka has been previously disturbed and improved, with only sparse vegetation occurring at the perimeter of the lot. This area may be habitat for general wildlife species, but it is likely only marginal habitat since it is disturbed. Impacts from use of this lot for parking may result in vehicle collisions with wildlife. Increased human presence may result in wildlife avoiding this area; however, since it is within the town of Eureka, wildlife using this area have likely become accustomed to human presence. The lighting proposed for the parking area may result in increased predation due to additional perch sites for raptors. Use of the parking lot in the town of Eureka is anticipated to have short-term, localized, negligible impacts on wildlife, including special status species.

Reclamation

As presented in **Table 4.17-1**, construction of mining and processing facilities as described in the Proposed Action would disturb a total of approximately 1,129 acres (not including existing non-MMI disturbance to be reclaimed), including approximately 718 acres of disturbance in habitat that has not been previously disturbed, and 395 acres within areas of existing disturbance. The Proposed Action would result in the removal of 482 acres of pinyon-juniper woodlands, of which 467 acres would be converted to a grass and forb dominated community, and eventually a shrub-dominated community, after reclamation. With the abundant seed source in undisturbed areas within and adjacent to the Plan boundary, single-leaf pinyon and Utah juniper would likely eventually reestablish in the reclaimed areas. However, mature woodlands could take 50 to 100 years or more to fully develop. The Proposed Action would remove 167 acres of curl-leaf mountain mahogany woodland, of which 117 acres would be reclaimed. Curl-leaf mountain mahogany would not be planted or seeded as part of the reclamation, although surrounding trees could provide a seed source. Mahogany woodlands could take hundreds of years to fully establish and mature within these reclaimed areas. The Proposed Action would also remove approximately 20 acres of sagebrush steppe, of which 18 acres would be converted to a grass and forb dominated community in the long-term following reclamation, as the larger species of sagebrush do not reestablish after disturbance for approximately 20 years (BLM, 2008f).

Overall, 975 acres, or 86 percent of the total disturbance associated with implementation of the Proposed Action, would be reclaimed and revegetated which would minimize the impacts to vegetation and wildlife communities. Un-reclaimed features include pits, ponds, some roads, and

stormwater diversion channels, totaling 154 acres, or 14 percent of the total disturbance, within the Plan boundary. Reclamation and revegetation activities are outlined in Section 2.2.19. The BLM-approved reclamation seed mix and application rate is outlined in **Table 2.2-16**. Except for existing tree species like pinyon, juniper, and curl-leaf mountain mahogany, the seed mix would provide for species similar to pre-disturbance communities. Interim reclamation would occur on growth media stockpiles and cut-and-fill slopes, and concurrent reclamation would occur in areas that have reached their final configurations and have been determined to be no longer required for mine operations. This interim and concurrent reclamation would re-establish some wildlife habitat in the short-term. Reclamation is anticipated to be completed within six years following cessation of active mining and residual heap leaching; however, prolonged drought could delay revegetation activities. As shown in **Table 2.2-18**, the Project would incorporate approximately 395 acres of the total existing disturbance within the mine area (i.e., 654 acres), and would reclaim an additional 25 acres of non-MMI disturbance, which would leave approximately 234 acres of existing disturbance remaining within the Plan boundary.

General Wildlife

Impacts to small mammals that may occur within the Plan boundary as described in Section 3.21.4.1would include direct mortality during clearing and grubbing operations and a loss of available habitat. Larger mammals, such as mountain lions that are secretive by nature, may remain at higher elevations. Other larger, more mobile wildlife as described in Section 3.21.4.1 that may occur within the Plan boundary would disperse once construction begins. As a result, direct mortality to larger wildlife is not expected, but larger wildlife species are expected to be displaced in the long term from the direct impacts of habitat removal and from the indirect impacts of mine disturbance. These impacts are expected to be long-term, localized, and minor to most species and the impacts would not result in population level impacts.

Migratory Birds

Habitats within the Plan boundary support a diversity of migratory birds. The mine and processing facilities would disturb approximately 1,129 acres (not including existing non-MMI disturbance to be reclaimed), of which approximately 718 acres would be within previously undisturbed habitat (i.e., the other 411 acres were previously disturbed or have been previously authorized for disturbance). Until reclamation occurs, this habitat would be lost as potential migratory bird nesting and foraging habitat. Approximately 482 acres of pinyon-juniper woodland habitat would be removed, which provides nesting and foraging habitat for species such as pinyon jay, Clark's nutcracker, and tree swallow (GBE, 2013). Approximately 167 acres of curl-leaf mountain mahogany woodland habitat would be removed, which provides nesting and foraging habitat for species such as mountain bluebird, black-throated gray warbler, and the mountain white-crowned sparrow. Approximately 20 acres of sagebrush steppe habitat would be removed, which provides nesting and foraging habitat for lark sparrow as well several special status species described in further detail below (e.g., greater sage-grouse, loggerhead shrike, etc.). There are no streams or areas of riparian vegetation that would be disturbed. Most of the mine features would be reclaimed, and once restored, would present suitable habitat for many migratory bird species. However, reclaimed areas would not provide habitat for woodland species as the time for these communities to reestablish can take 50 to 100 years or more.

Direct mortality to migratory birds is expected to be negligible, in part due to the EPMs described in Section 2.2.20. No surface disturbance would occur during the migratory bird breeding season (April 1 through July 31), and if surface disturbing activities are unavoidable during the breeding season preconstruction surveys would be required. If nests are found, an appropriate buffer would be maintained until there is no longer breeding/brood-rearing activity around the nest site as determined by a BLM-approved biologist.

Because EPMs and the ability of fledged birds to disperse would limit or reduce direct mortality, it is expected that direct impacts to migratory birds would primarily be limited to habitat removal and fragmentation as was discussed in the general impacts section above. As the habitat to be disturbed would be primarily woodlands (pinyon-juniper and curl-leaf mountain mahogany), the direct impacts would be long term due to the length of time it takes for these areas to recover. Because suitable habitat exists adjacent to the Plan boundary, these impacts are anticipated to be localized and minor. In addition, some habitats would recover after reclamation and provide nesting and foraging habitat for migratory birds, although likely different species than those that would utilize the original woodland habitat.

Indirect long-term effects due to noise/increased human presence are not expected to impact nesting birds due to the EPMs described above. Noise/increased human presence may cause adult and fledged birds to vacate areas adjacent to disturbance. Since suitable habitat exists adjacent to the Project area, indirect impacts from noise would be long-term, regional, and minor.

Raptors

Potential impacts to raptors include direct mortality, habitat or nesting substrate removal, and indirect (e.g., noise) disturbance. Direct mortality and indirect disturbance to raptors would be prevented or limited by the EPMs described in Section 2.2.20. EPMs include no surface disturbance during the breeding season (March 1 through July 31), and if surface disturbing activities are unavoidable during the breeding season, preconstruction surveys would be required. If nests are found, a protective buffer (size determined by the habitat requirements of the species) would be maintained until there is no longer breeding/brood-rearing activity around the nest site as determined by a BLM-approved biologist.

Removal of nesting habitat would be a direct long-term impact to potentially nesting raptors. However, because no raptors were found nesting within the Plan boundary (of the 19 nests observed during baseline surveys, none of the active or inactive nests were found within the Plan boundary) the effect of nesting habitat removal is anticipated to be localized and negligible. Seven of the 19 nests were identified as golden eagle nests. Golden eagles are known to abandon nests early in the nesting chronology due to anthropogenic disturbance. As described in Section 2.2.20, if construction activities occur during the breeding season, pre-construction surveys would be conducted to determine nest occupancy. If a nest is found to be active, or another nest is found to be active, an appropriate construction buffer, determined by the BLM, would be enacted until the bird's nest is no longer considered active and/or the young have fledged as determined by a BLM-approved biologist. As a result, no impacts to nesting golden eagles are anticipated.

While non-nesting golden eagles may be initially disturbed by an increase in noise, they have been known to habituate to increased noise levels, depending on the distance to the disturbance and whether the nest or roost is within line of sight of the activities. Over time and with regular exposure to the increased noise levels, an individual may return to near baseline behavior. As a result, indirect noise related impacts to golden eagles are expected to be long-term, regional, may affect, but not likely to adversely affect.

Direct disturbance to golden eagle foraging habitat would occur as a result of the Proposed Action. A total of 718 acres of habitat would be disturbed including approximately 20 acres of sagebrush habitat, reducing available prey base. These long-term impacts would occur through the life of the mine, though concurrent reclamation would occur in areas that have reached their final configurations and have been determined to be no longer required for mine operations. The available foraging habitat within the Roberts Mountain Range is likely able to support foraging of displaced golden eagles within another territory. As a result, the long-term direct impacts of habitat loss would be localized, and may affect, but not likely to adversely affect golden eagles because of the amount of foraging habitat available in the area.

Impacts to golden eagles and their nesting territory because of the Proposed Action would be long-term, regional, and may affect, but not likely to adversely affect golden eagles. Foraging habitat within the Plan boundary is expected to regain sufficient prey base over time. Implementation of the Proposed Action could result in the creation of nesting habitat. The pit, which would not be reclaimed, could create nesting substrate for prairie falcons and other cliff nesting species, while holes or crevices could provide nesting habitat for some owls and American kestrels. However, foraging habitat may be the limiting factor for raptors in the area rather than nesting habitat.

Removal of foraging habitat would have direct long-term adverse or beneficial effects to any raptors nesting near the Plan boundary, as well to other migratory raptors. Because there is other suitable foraging habitat adjacent to the Plan boundary, the direct long-term effects are expected to be localized and minor. Also, at the end of the Project and following reclamation release, most of the disturbed habitat would be reclaimed and provide foraging habitat for some raptor species. There may be some benefit to raptors from the conversion of woodlands to shrublands and grasslands as these new foraging habitats could be more suitable to support populations of small mammal prey base (e.g., jackrabbits, ground squirrels, etc.).

Indirect long-term effects due to noise/increased human presence are not expected to impact nesting raptors due to the EPMs described above. Noise/increased human presence may cause adult and fledged raptors to vacate areas adjacent to disturbance. Since suitable habitat exists adjacent to the Plan Boundary, indirect impacts due to noise would be long-term, localized, and minor.

Game Species

Mule Deer

Implementation of the Proposed Action would result in the disturbance of mule deer habitat including approximately 482 acres of pinyon-juniper woodland, 167 acres of mountain mahogany, and 20 acres of sagebrush steppe. Of this, approximately 602 acres would be reclaimed. However, until reclamation has taken place, these areas would be unavailable for use by mule deer. Once reclaimed and released, the habitat would be changed from woodland/shrub habitat to shrub/grassland habitat.

Noise and human activity would be expected to cause deer to avoid areas adjacent to active disturbance, particularly during the early phases of mine development (Sawyer et al., 2009). The location of the proposed disturbance within the Plan boundary is in proximity to a known migratory corridor for mule deer where deer move between summer range in the higher elevation woodlands to the lower piedmont slopes in the winter. Depending on snow conditions, mule deer in the NDOW hunt unit 143 (Roberts Mountain area) move to the Mountain Boy and Fish Creek ranges south of U.S. Highway 50 for the winter. Therefore, the proximity of the proposed disturbance would partially fragment their seasonal habitat.

The impacts of direct mortality due to vehicle collisions would be long-term (limited to the life-of-mine operations). The impacts would be significant to individuals, but given the relatively small increase in traffic, these impacts would not affect the overall population viability. The direct effects of habitat removal would be long term (occurring until reclamation is complete and due to the change from woodland to grassland/sagebrush habitat). Since additional crucial summer habitat is available adjacent to the Plan boundary, the long-term effects of habitat loss are anticipated to be localized and minor. The impacts of habitat fragmentation on mule deer using the migratory corridor are more difficult to quantify, as its unknown exactly what parts of the mapped migratory corridors receive the heaviest use. However, as the mapped migratory corridors include undisturbed habitat adjacent to the Project, migratory mule deer would not be prevented from moving between summer and winter habitat. Sufficient undisturbed habitat occurs to allow for migration, the overall effects are anticipated to be regional, long-term, and minor.

Pronghorn Antelope

The Proposed Action would disturb approximately 18 acres of year-round habitat for pronghorn antelope. Direct effects to Pronghorn antelope from the Proposed Action could occur as a result of vehicle collisions or loss of habitat. These effects would be localized, long-term, and minor to moderate for individuals, but negligible for the population as a whole due to the small amount of disturbance relative to habitat available.

Regarding indirect effects, pronghorn antelope may show avoidance behavior similar to mule deer, and may initially avoid areas of active disturbance. However, as active disturbances would primarily be located outside of pronghorn distribution, the impacts of noise and increased human presence are expected to be negligible, long-term and localized.

Game Birds

Mine development is expected to have negligible adverse effect on dusky grouse, which may occur in low numbers in the Plan boundary and the general vicinity in the mid- to high-elevations habitats. Foraging and nesting habitat for mourning doves would be lost due to development of the Proposed Action, and some loss of chukar habitat may occur through habitat removal. Indirect long-term impacts to game birds could be gradual over the life-of-mine and result in a reduction in available habitat, and are anticipated to be negligible to minor and localized.

Greater Sage-Grouse

The Proposed Action is not expected to result in direct mortality to greater sage-grouse, as any individuals within the Plan boundary are expected to disperse upon commencement of any ground-disturbing activities.

The Proposed Action would result in the direct loss of greater sage-grouse habitat. The Project would disturb approximately 11 acres of undisturbed late summer habitat, approximately five acres of undisturbed winter habitat, and approximately six acres of undisturbed nesting and early brood rearing habitat. According to the SEP December 2015 mapping, the Proposed Action would disturb approximately 297 acres of PMHA and 767 acres of GHMA, of which approximately 395 acres (37 percent) has been previously disturbed (**Table 4.21-1**).

The effects to approximately 718 acres of disturbance within greater sage-grouse habitat would be long-term lasting up to 20 years, before reclamation to a shrub dominated community are re-established. There would be an additional 154 acres of permanent (non-reclaimed) adverse effects.

Table 4.21-1 Proposed Action Disturbance within Greater Sage-Grouse Habitat

SEP Map (Year, Month)	Feature	Disturbance by Greater Sage-grouse Habitat Type[1]			
		PHMA		GHMA	
		Public	Private	Public	Private
SEP December 2015 Map	Within Existing Disturbance	111	59	170	55
	Proposed New Disturbance	78	49	522	20
	Total Disturbance	**189**	**108**	**692**	**75**

[1] Total mine related disturbance is 1,129 acres. The above acreage calculation does not include the 65 acres associated with exploration activities which may occur in both PHMA and GHMA habitat.

No leks would be directly disturbed because of the Proposed Action. There is the potential, however, for the Proposed Action to indirectly affect greater sage-grouse leks as a result of increased anthropogenic activity in the vicinity of the leks and increases in ambient noise. Anthropogenic activity in the vicinity of the leks, such as light and large vehicle road traffic, could indirectly impact leks and particularly those leks that are within line-of-sight of the access roads.

Roberts Creek Road would have 40 light vehicle trips per day Additionally, 10 large vehicle round-trips per day would occur on the Three Bars Road. Road maintenance would also occur along the Roberts Creek Road and the Three Bars Road as needed. Potential impacts could be greater for those leks that are closer to the project and it access roads. Leks within four miles of this alternative, including their linear distance from each road, are presented within **Table 3.21-4**.

To assess potential indirect impacts from an increase in ambient noise levels, baseline ambient noise values were collected for two leks near the Plan boundary, the Three Bar #1 Lek and Roberts Creek #2 Lek. These leks are within 1.6 and 1.5 miles, respectively, of the Plan boundary. The data collected are shown in **Table 3.21.5** in Section 3.21.4.1 and are summarized in **Table 4.21-2**.

Table 4.21-2 Greater Sage-grouse Lek Mean Ambient Noise Values

Summary of Mean Ambient Noise Monitoring Results Between the Hours of 5:00 a.m. and 9:00 a.m.			
Lek Name	**Noise Levels (dBA)**		
	L_{eq}	**L_{50}**	**L_{90}**
3 Bar #1 Lek Median Sound Levels	32	23	19
Roberts Creek #2 Mean Sound Level	34	22	19

Source: Brennan, 2016

Although **Table 4.21-2** values are all reported in dBA, they represent different characteristics of the noise levels, as described in Section 3.21.4.1 in this EIS. Greater sage-grouse noise research by Patricelli et al. (no date) suggests that when determining potential impacts at lek sites, comparing the predicted L_{50} values to the existing L_{90} values is most appropriate. As such, the L_{90} value of 19 dBA was used for assessing potential impacts to both leks.

Noise modeling was conducted by J.C. Brennan & Associates to analyze potential propagation and noise attenuation of proposed mining activities within the vicinity of the focus leks using specifications for enhanced generator silencer packages to reduce noise impacts to greater sage-grouse leks. This modeling used CadnaA software that includes model covariates for various environmental conditions and allows for mining noise source-specific inputs. Sound power level data for each noise source was used as direct inputs to the CadnaA Noise Prediction Model. The CadnaA model is a state-of-the-art noise prediction model, which is able to predict overall noise levels for multiple noise sources, while also accounting for topography, air temperature, humidity, wind speed and wind direction. Inputs to the CadnaA model included ground topography and ground type, noise source locations and heights, receiver locations, and sound power level data. Noise level data collected in the field for similar equipment, operations, and haul trucks were input into the model.

Noise level data for the following equipment and operations were used in the modeling: Pit operations using power shovel, front-end loader, drilling, and haul truck loading; waste rock storage using haul trucks and bulldozer; heap leach facility operations using bulldozer and radial stacker; operation of existing haul roads; operation of existing primary and secondary crushers

operating continuously; continuous operation of overland conveyor; continuous operation of processing plant; use of the Three-Bars access road by 10 pickup trucks, one automobile, and five heavy trucks per peak hour, and; use of Roberts Creek Road by 12 light vehicles per peak hour (Brennan, 2016). Once the modeled result value was determined for the lek location, it was compared to the ambient data plus a 10 dB(A) threshold for the leks, as this has been identified as an appropriate elevated noise value for determining potential impacts (Patricelli et al., 2013).

Based upon the CadnaA model, noise levels due to activities associated with the Proposed Action are predicted to be 16 dBA (L_{50}) at the Three Bar #1 lek. Background hourly residual (L_{90}) noise levels between 5:00 a.m. and 10:00 a.m. were measured to be 19 dBA. Therefore, the lek would be exposed to project noise levels less than existing ambient noise levels (Brennan, 2016), and this lek would not be exposed to an increase in noise levels. It's important to note that the CadnaA modeling predicted noise values are only specific to noise generated from mining activities. It's also important to note that when evaluating additive noise in dBA, a logarithmic relationship between the values is applicable, which is what accounts for the lack of an increase to the ambient noise value at the Three Bar #1 lek as a result of mining related predicted noise value of 16 dBA. Noise levels associated with the Proposed Action are predicted to be 27 dBA (L_{50}) at the Robert's Creek #2 lek. Background hourly residual (L_{90}) noise levels were measured to be 19 dBA. Therefore, the lek would be exposed to project noise levels greater than existing ambient noise levels (Brennan, 2016); however, the increase in noise levels would be below the 10 dBA threshold, as illustrated in **Table 4.21-3**.

Table 4.21-3 Greater Sage-grouse Ambient and Predicted Noise Values

Lek Name	Noise Levels (dBA)		
	Ambient (L_{90})	Predicted (L_{50})	Increase over Ambient
3 Bar #1 Lek Median Sound Levels	19	16	0
Roberts Creek #2 Mean Sound Level	19	27	8

Source: Brennan, 2016

Because noise modelling indicates that increases exceeding the 10 dBA threshold are unlikely, and because EPMs would be in place restricting access road use during the lekking period, long-term, indirect effects of increased anthropogenic activity and noise on greater sage-grouse are expected to be long-term, regional, may affect, but not likely to adversely affect greater sage-grouse.

Other Special Status Species

The Proposed Action impacts to BLM sensitive birds would be similar to the impacts described for migratory birds. Direct mortality and indirect long-term effects due to noise/increased human presence are expected to be regional and may affect, but not likely to adversely affect, due in part to the EPMs described in Section 2.2.20. Migratory bird EPMs that could also benefit special status avian species include no surface disturbance during the breeding season (March 1 through July 31 for raptors, April 1 through July 31 for other avian species), or preconstruction surveys if surface disturbing activities are unavoidable during the breeding season. Additionally, other EPMs

may help to protect special status migratory birds and raptors such as reduced speed limits, wildlife escape ramps in ponds, and preventing surface ponding of cyanide solution on heap leach.

The Proposed Action would remove approximately 20 acres of sagebrush habitat that provides potential sage-thrasher and Brewer's sparrow nesting and foraging habitat. Removal of approximately 482 acres of pinyon-juniper woodland would reduce potential pinyon jay nesting and feeding habitat. Impacts to large shrubs, particularly large black greasewood, could impact loggerhead shrike nesting habitat. Northern goshawk and Swainson's hawks were not observed during field surveys, although they are likely to occur elsewhere in the Roberts Mountain Range and may forage within the Plan boundary. Because sage-thrasher, Brewer's sparrow, pinyon jay, loggerhead shrike, Northern goshawk, and Swainson's hawk are expected to occur only occasionally, and because sagebrush and pinyon-juniper habitat is abundant within the region, the impacts to these species associated with habitat removal would be long-term, localized, may affect, but not likely to adversely affect special status species.

An aerial survey conducted by GBE in 2012 observed six active golden eagle nests and one inactive golden eagle nest. None of the active or inactive golden eagle nests were within the Plan boundary. All the eagle nests observed were located on ledges on large rock outcrops or cliffs.

No ferruginous hawk nests have been identified within the Plan boundary, although ferruginous hawks are known to nest in the general area. Three nests were located in the pinyon-juniper – sagebrush steppe interface near the Plan boundary in 2012 (GBE, 2013). Two of the nests observed were constructed in juniper trees and were vacant at the time of the survey but appeared to have been used in 2012. Because no ferruginous hawk nests have been identified within the Plan boundary, and because of the EPMs in place, neither direct mortality nor indirect noise related effects are expected. There would be a loss of approximately 482 acres of pinyon-juniper habitat, which represents a loss of potential nesting habitat. However, because similar habitat exists nearby the long-term effects of loss would be long-term, localized, and may affect, but not likely to adversely affect.

Western burrowing owl suitable habitat is available adjacent to the Atlas Haul Road and one adult bird was observed near the Atlas Mill Site in late August. During construction, burrowing owl burrows could be crushed and/or covered by construction. As described for other migratory birds, MMI would make reasonable effort to conduct vegetation-clearing activities outside of the breeding season for western burrowing owls (March 1 through July 31). This would minimize the potential for burrow destruction and mortality. If disturbance during the breeding season is unavoidable, pre-disturbance surveys would be conducted by a BLM-approved biologist prior to any vegetation clearing activities. These EPMs would reduce the risk of direct mortality to negligible, as well as reduce the risk that burrowing owls are displaced or abandon their burrows a result of noise and increased human activities. Because disturbance near burrows would be limited by the EPM described above, and because other habitat is available in the area, long-term noise related impacts (limited to construction and operation of the mine) would be regional and may affect, but not likely to adversely affect western burrowing owl. Long-term direct habitat loss

would also occur, but is also expected to be localized, long-term, and may affect, but not likely to adversely affect western burrowing owl due to the habitat available in the area.

Pygmy rabbit habitat was identified near the Atlas Haul Road. Because there would be no disturbance along the Atlas Haul Road, with the exception of maintenance, impacts in that area would be limited to direct mortality due to vehicle collisions. Although any mortality would be significant to individuals, it is difficult to determine the magnitude of impacts to the population as the number of burrows within the area to be disturbed has not been quantified. Given the relatively small size of the area to be impacted, it is anticipated that few burrows would be impacted and the impacts would be localized, long-term, and may affect, but not likely to adversely affect pygmy rabbit. However, if there are several burrows in the area the impacts could be moderate and possibly have population level effects. Noise related impacts would be localized and may affect, but not likely to adversely affect pygmy rabbit due to the short time period of construction.

Bats

Shafts or adits are not known to occur within the Plan boundary. The principal impacts to BLM-sensitive bat species would occur due to a loss of forested habitats, which represent potential roosting areas for such species as long-eared myotis, silver-haired bats, and as bat foraging habitat. Impacts to cliffs and outcrops that do occur in small amounts could also impact bat roosting habitat. The most important bat foraging habitat in the area are wetlands associated Roberts Creek, as this habitat supports the greatest insect diversity. However, the Proposed Action would avoid any impacts to these habitat types. The effects of habitat removal would be long term, but are expected to be localized and may affect, but not likely to adversely affect sensitive bats as roosting habitat (i.e., pinyon-juniper and cliffs/outcrops) are common throughout the region.

4.21.2.1 Unavoidable Adverse Impacts

The Proposed Action would permanently impact various types of wildlife habitat throughout the Plan boundary. A permanent loss of a portion of wildlife habitat would result from the portions of the Proposed Action that would not be subject to reclamation, and from the reclaimed portions that would be converted to new vegetation communities post-mining (i.e., woodlands converted to grassland/shrubland once reclamation was successful). However, this change, and in some cases loss, of habitat would be small as compared to the available undisturbed wildlife habitat within and immediately adjacent to the Plan boundary.

4.21.2.2 Irreversible and Irretrievable Commitments of Resources

Special status and general wildlife species within the Plan boundary may be subject to irreversible commitments of habitat resources with regards to the following un-reclaimed disturbance within the Plan boundary: pits, ponds, some roads, and stormwater diversion channels. Un-reclaimed disturbance would total approximately 154 acres.

4.21.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Most impacts to wildlife resources would initially result from construction activities and would be temporary in duration, but some would persist for the operational life of the Proposed Action. In

the long-term and with successful reclamation, impacts to long-term productivity of most wildlife resources would be negligible to minor.

4.21.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

This alternative contains most of the primary elements of the Proposed Action. As a result, most of the direct and indirect impacts would be similar to the Proposed Action, but with the potential for additional impacts due to the additional disturbance associated with construction and operation of the distribution line.

Table 4.17-3 shows the approximate acres of disturbance from the 25 kV power distribution line that would be in addition to the disturbance associated with the Proposed Action. All proposed disturbance for the distribution line would occur entirely within the 40-foot permanent ROW, and for purposes of this analysis it was assumed that the entire 40-foot ROW could be disturbed in some manner. As a result, disturbance associated with the distribution line within the 40-foot permanent ROW would be approximately 130 acres.

Following construction, temporary areas of disturbance would be re-contoured to match the surrounding terrain. Permanent disturbance would consist of a centerline access road, which would remain for permanent operation and maintenance, and a small area around each pole. Since pole locations have not yet been determined, disturbance calculations by vegetation community are not feasible. As a result, the total 40-foot ROW was assumed to be disturbed, which would be a conservative estimate of disturbance within the permanent 40-foot operation and maintenance ROW. **Table 4.17-3** details potential vegetation disturbance within the 40-foot permanent ROW.

Construction

Construction of the 25 kV distribution line would disturb two types of wildlife habitat, pinyon-juniper woodland (approximately eight acres) and sagebrush steppe/other mixed sagebrush shrubland (approximately 120 acres). Land–clearing activities associated with construction (e.g., access roads, work areas) would remove habitat; result in mortality from trampling or crushing; increase noise levels due to heavy equipment operation; and increase vehicular and human presence along the ROW. Many of the wildlife species that inhabit the ROWs are mobile and would likely vacate the construction area and use adjacent habitat. Species that are slow moving or that tend to retreat to underground could be directly killed or injured during construction. The increased human activity and noise associated with construction activities would likely cause wildlife to temporarily avoid the area and displace into adjacent, undisturbed suitable habitat. As described for the Proposed Action, the potential effects of noise depend on the spatial relationship between a noise source and noise-sensitive receptors. Noise-generating activities associated with the Proposed Action include earthmoving, equipment operation, and vehicular traffic. Increased vehicular traffic associated with construction activities has the potential to cause an increase in wildlife-vehicle collisions and result in direct mortality to wildlife.

Maintenance and Operation

As presented in **Table 4.17-3**, construction of the distribution line would disturb approximately 130 acres. Approximately eight acres of pinyon-juniper woodlands would be disturbed, of which approximately four would be converted to a grass and forb dominated community, and eventually a shrub dominated community after reclamation. As described for the Proposed Action, mature pinyon-juniper woodlands could take 50 to 100 or more years to reestablish. As stated above, approximately 120 acres of various sagebrush communities would be disturbed.

The proposed distribution line would consist of wood monopole structures approximately 40 to 60 feet in height. Avian Power Line Interaction Committee (APLIC) recommendations (APLIC, 2006) would be followed with adequate spacing between conductors (Mt. Wheeler, 2014). In addition, as stated in Section 2.2.20, any distribution line within four miles of active or pending greater sage-grouse leks would be constructed with anti-perching devices.

General Wildlife

Impacts to general wildlife within the Plan boundary would be the same as described for the Proposed Action. Within the distribution line ROW, impacts to small mammals include direct mortality during clearing and grubbing operations, direct mortality due to increased predation from perching raptors, indirect impacts due to construction noise, and loss of available habitat in areas temporarily and permanently cleared for disturbance. More mobile wildlife would be displaced in the long-term from the direct impacts of habitat removal and temporarily due to indirect impacts of construction activity. Because there is suitable habitat directly adjacent to the ROW, most impacts are not expected to be more than minor, but would be regional and long-term. Increased predation would also be long-term, regional, and minor for most general wildlife species due to the population stability of these species and availability of additional habitat adjacent to the ROW (predation on greater sage-grouse is discussed below). When combined with other impacts of the Proposed Action, the impacts to most species would be long-term, regional, and minor, and would not result in population level impacts.

Migratory Birds

Impacts to migratory birds within the Plan boundary would be the same as described for the Proposed Action. Within the distribution line ROW, the types of impacts to migratory birds would be the same as described for the Proposed Action, with the exception of the potential for collisions and increased predation. Bird collisions with transmission lines may occur when a transmission line or other aerial structure transects a daily flight path used by a concentration of birds, or when migrants are traveling at reduced altitudes and encounter tall structures in their path (BLM, 2012a). The risk of bird collisions is higher along wetlands, valleys that are bisected by transmission lines, and within narrow passes where transmission lines are perpendicular to flight paths (APLIC, 2006). Because conductor spacing would also follow APLIC recommendation, electrocution risk would be reduced and the long-term impact to migratory birds would be regional and negligible.

Direct mortality and indirect long-term impacts would be negligible due to the EPMs described above and in Section 2.2.20, and the primary impact would be the disturbance of an additional

130 acres of habitat for migratory birds. Until reclamation occurs, this habitat would be lost as potential migratory bird nesting and foraging habitat. The majority of the habitat that would be impacted would be sagebrush shrublands, with a small amount of pinyon-juniper woodland. Because these habitats would take longer than three to five years to recover, the direct impacts would be long term. These impacts are anticipated to be minor due to the presence of habitat adjacent to the ROW, and migratory birds would continue to use areas within the ROW following reclamation. When combined with other impacts of the Proposed Action, the impacts would be long-term, regional, minor, and would not result in population level impacts.

Raptors

Raptor species that would forage and nest within the Project area, would also use the ROW corridor for forage. Within the Plan boundary, the types of impacts to raptors would be the same as described for the Proposed Action and for migratory birds. However, additional impacts from the distribution line may occur, which includes the risk of collisions and electrocutions, noise disturbance, and additional forage area disturbance. The risk of collisions, electrocutions, and noise disturbance would be limited due to EPMs as described for migratory birds, as well as in the Proposed Action. The impacts of habitat disturbance would be long-term, but are expected to be minor due to the presence of available adjacent habitat. When combined with other impacts of the Proposed Action, the impacts would be long-term, regional, minor, and would not result in population level impacts.

Game Species

Mule Deer

Approximately 130 acres (16 acres of agricultural, 10 acres of crucial winter range, 97 acres within transition range, and seven acres within winter range) of mule deer habitat would be lost until reclamation has taken place. long-term direct effects of 130 acres of habitat loss would have a minor effect on mule deer due to the presence of suitable habitat adjacent to the ROW. The location of the ROW also crosses several known migratory corridors for mule deer where deer move between summer range in the higher elevation woodlands to the lower piedmont slopes in the winter. However, construction and operation of the distribution line is not expected to impede mule deer migration. Noise and human activity would be expected to cause deer to avoid areas adjacent to active construction. Noise and construction activity related indirect effects would be short-term, and are not expected to have more than a negligible effect on mule deer. Effects within the Plan boundary would be the same as described for the Proposed Action and the combined impact would be long-term, regional, minor, and would not result in population level impacts.

Pronghorn Antelope

Approximately 89 acres of mapped habitat for pronghorn antelope would be lost until reclamation has taken place. Effects to pronghorn antelope are anticipated to be the same as described above for mule deer; long-term, regional, minor effects due to habitat loss and negligible effects due to noise and human activity. Effects within the Plan boundary would be the same as described for the Proposed Action and the combined impact would be long-term, regional, minor, and would not result in population level impacts.

Game Birds

Distribution line construction would result in a loss of foraging and nesting habitat for mourning doves, chukar, and California quail, beyond what was described for the Proposed Action. Because of suitable habitat adjacent to the ROWs, the impacts of habitat are anticipated to be long-term and negligible to minor. Impacts to greater sage-grouse are discussed further under the greater sage-grouse section.

Greater Sage-Grouse

Impacts to greater sage-grouse within the Plan boundary would generally be as described for the Proposed Action, with the exception of the possibility of increased predation. Construction of the distribution line would have similar types of effects, but there would be a greater overall loss of habitat and impacts to four additional leks that are located along the 25 kV distribution line. Activities within the 40-foot powerline ROW would potentially disturb an additional approximately 126 acres of late summer habitat, 106 acres of winter habitat, and approximately 75 acres of nesting and early brood rearing habitat. According to the SEP December 2015 mapping, construction of the distribution line would disturb approximately 80 acres of PMHA, 33 acres of GHMA, and 13 acres of OHMA. However, approximately 24 acres of PHMA has been previously disturbed from the existing Atlas 25 kV distribution line. This disturbance is in addition the disturbance from the Proposed Action (**Table 4.21-4**).

Table 4.21-4 25 kV Distribution Line Disturbance within Greater Sage-Grouse Habitat in the 40-Foot Permanent ROW

SEP Map (Year, Month)	Feature	Disturbance by Greater Sage-grouse Habitat Type[1]					
		PHMA		GHMA		OHMA	
		Public	Private	Public	Private	Public	Private
SEP December 2015 Map	Within Existing Disturbance	24	0	0	0	0	0
	Proposed New Disturbance	53	3	33	0	13	<1
	Total Disturbance[1]	**77**	**3**	**33**	**0**	**13**	**<1**

[1]Approximately four acres are within non-habitat.

The impacts of disturbance from this alternative and the Proposed Action to greater sage grouse habitat would be long term. However, if this alternative is selected, both direct impacts from disturbance as well as indirect impacts, primarily associated with noise, would either be offset using the state of Nevada's CCS as described for the Proposed Action, or a proponent driven mitigation plan would be developed in coordination with the BLM, the NDOW and the USFWS. As such, the long-term impacts to greater sage-grouse, even with the additional disturbance, may affect, but not likely to adversely affect greater sage-grouse.

Regarding noise disturbance to leks; noise analysis for two leks near the Plan boundary are discussed for the Proposed Action. This would be the same for leks near the Plan boundary under this alternative. Noise disturbance to leks near the distribution line ROW was not modelled. However, as construction of the distribution line would occur outside the breeding period, there would be no impacts to lekking birds from construction. There is not expected to be sufficient noise from maintenance and operation to impact lekking birds.

Impacts associated with increased anthropogenic activity in the form of light and large vehicle traffic along access roads for this alternative are expected to be the same as those discussed under the Proposed Action. However, occasional light vehicle traffic along the center line road within 40-foot permanent ROW could also occur for distribution line inspection and large vehicle traffic for occasional maintenance. Leks within four miles of this alternative, including their linear distance from each road and from the 40-foot permanent ROW, are presented within **Table 3.21-9**.

Regarding predation, increased raptor and corvid use of the poles for nesting or as hunting perches can result in increased predation at leks, nesting habitat, brood habitat, and winter habitat (BLM, 2002c). Greater sage-grouse may avoid habitat within 600-meters of the distribution line due to the presence of structures used for perching. There are 10 active leks and one pending within four miles of the distribution line ROW and the Proposed Action. Further information on these eleven leks, including their activity status and peak male attendance number, is presented in **Table 3.21-9**. Perch discouraging devices would be installed on all poles within four miles of these leks (and any others that may be discovered or become active later). As a result, impacts due to increased predation would be minor. Impacts to greater sage-grouse from this alternative would be slightly greater than for the Proposed Action. The impacts would be long-term, and may affect, but not likely to adversely affect greater sage-grouse, and are not expected to result in population level impacts.

Other Special Status Species

Impacts along the distribution line ROW to BLM sensitive birds would be similar to the impacts described for migratory birds. Direct mortality and indirect long-term effects due to noise/increased human presence may affect, but not likely to adversely affect BLM sensitive birds, due in part to the EPMs described in Section 2.2.20. Direct effects include loss of habitat. Construction of the distribution line would remove approximately 120 acres of sagebrush habitat that provides potential sage-thrasher and Brewer's sparrow nesting and foraging habitat, as well as foraging habitat for loggerhead shrike, northern goshawk, and Swainson's hawk. Removal of approximately nine acres of pinyon-juniper woodland would reduce potential pinyon jay nesting and feeding habitat. Because sage-thrasher, Brewer's sparrow, pinyon jay, loggerhead shrike, Northern goshawk, Swainson's hawk, and other raptors are expected to occur only on a migratory basis, and because sagebrush and pinyon-juniper habitat is abundant within the region, the impacts to these species associated with habitat removal would be long-term and may affect, but not likely to adversely affect these species.

Impacts to golden eagles are expected to be the same as those identified under the Proposed Action; however, the distribution line has potential to provide increased injury risk to species such as eagles. Adherence with APLIC guidelines would help to reduce the risk of eagle injuries.

Pygmy rabbit habitat was identified along the distribution line ROW where it parallels Roberts Creek Road. Installation of the distribution line has potential to provide additional perch sites for raptors in the area, which could result in increased predation of small mammals such as pygmy rabbits. Noise associated with construction could also cause pygmy rabbits to abandon burrows located near the disturbed areas. Disturbance within this area could result in direct mortality and the destruction of burrows. Disturbance within occupied pygmy rabbit habitat is likely to be minor and final design of the distribution line may allow the habitat to be spanned, which would prevent disturbance. However, without knowing final design, it is assumed for this analysis that a small amount of habitat could be disturbed. Given the small size of the area likely to be impacted, it is anticipated that few burrows would be impacted and the impacts may affect, but not likely to adversely affect pygmy rabbit. If there are several burrows in the area the impacts may affect, and would likely adversely affect pygmy rabbit, and possibly have population level effects. Noise related impacts may affect, but would not likely adversely affect pygmy rabbit due to the short time period of construction. The long-term loss of habitat may affect, but would not likely adversely affect pygmy rabbit, due to the small amount of habitat disturbed.

Impacts to bats within the Plan boundary would be the same as described for the Proposed Action. Within the distribution line ROW, an additional nine acres of forested habitat, which provides bat roosting sites, would be lost. There is no proposed disturbance to wetlands, which provide prime foraging habitat for bats. Bats may forage within the ROW, but because hibernacula habitat would not be disturbed, direct and indirect impacts to bats may affect, but would not likely adversely affect sensitive bat species.

4.21.3.1 Unavoidable Adverse Impacts

This alternative would permanently impact various types of wildlife habitat throughout the Plan boundary and distribution line ROW. A permanent loss of a portion of wildlife habitat would result from areas that would not be subject to reclamation, and from the reclaimed portions that would be converted to new vegetation communities post-mining (i.e., woodlands converted to grassland/shrubland). However, this change, and in some cases loss, of habitat would be small as compared to the available undisturbed wildlife habitat within and immediately adjacent to the Plan boundary and distribution line ROW.

4.21.3.2 Irreversible and Irretrievable Commitments of Resources

Both special status and general wildlife species within the Plan boundary and distribution line ROW may be subject to irreversible commitments of resource with regards to the following un-reclaimed disturbance: pits, ponds, access roads, and stormwater diversion channels (un-reclaimed disturbance would total approximately 154 acres. The distribution line would be fully reclaimed after closure of the Project, including the removal of the poles, conductors, insulators, and hardware to the mine site, so no additional irreversible commitment of resources would occur to wildlife under this alternative.

4.21.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Most impacts to wildlife resources would initially result from construction activities and would be temporary in duration, but some would persist for the operational life of the mine and associated distribution line.

4.21.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road reducing anthropogenic activity in northern Kobeh Valley, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road, thereby increasing activity in northwestern Kobeh Valley. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. Under this alternative, there would be no change in direct effects due to disturbance from the Proposed Action. The amount of traffic going to/from the mine would be the same under this alternative as for the Proposed Action, only the location of traffic related impacts would change. The indirect impacts to the leks located along Roberts Creek Road would not occur under this alternative. Mine-related traffic under this alternative would be subject to seasonal timing restrictions from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. Indirect impacts to the leks located adjacent to mine and processing facilities and along Three Bars Road could still occur under this alternative. This alternative would impact 11 fewer leks than the Proposed Action.

Since the habitat is largely similar between the Three Bars Road/Atlas Haul Road and the Roberts Creek Road, the magnitude of any direct impacts related to traffic (i.e., vehicle related mortality) would be the same to general wildlife as described for the Proposed Action since the amount of traffic would not change, only the effects would be concentrated along one road. There would be no direct impacts to greater sage-grouse at leks located along Roberts Creek Road from this alternative.

Impacts associated with increased anthropogenic activity in the form of light and large vehicle traffic along the Three Bars Road/Atlas Haul Road for this alternative are expected to be slightly greater as those discussed under the Proposed Action. This is particularly true for leks in closer proximity to and especially within line-of-sight of the Three Bars Road/Atlas Haul Road. However, no potential traffic impacts would occur as a result of this alternative to those leks adjacent the Roberts Creek Road as there would be no vehicles using it. Leks within four miles of this alternative, including their linear distance from the Three Bars Road/Atlas Haul Road, are presented within **Table 3.21-11**.

With respect to noise, particularly on greater sage-grouse, the magnitude of effects is also not likely to change. This is primarily due to noise modeling results that indicate noise levels associated with the Proposed Action would be below threshold values for greater sage-grouse

along both access routes. However, no impacts from noise to leks along Roberts Creek Road are expected from this alternative.

Impacts to wildlife from this alternative are expected to be long-term and moderate. These effects would similar to, but slightly less than, the Proposed Action.

4.21.4.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts from this alternative would be the same as described for the Proposed Action.

4.21.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources from this alternative would be the same as described for the Proposed Action.

4.21.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity for this alternative would be the same as described for the Proposed Action.

4.21.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action, including the use of Three Bars Road for heavy vehicle traffic. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. The direct and indirect effects of this alternative would be similar to those described for the Proposed Action, except under this alternative there would be impacts from traffic on the Mount Hope well field road. The amount of traffic going to/from the mine would be the same under this alternative as for the Proposed Action, only the location of traffic related impacts (including direct impacts from vehicle related mortality and indirect effects from noise) would change. A total of 40 round-trip light vehicles would use the Mount Hope access road and well field road under this alternative.

Direct effects under this alternative in the mine and processing area would be the same as described in the Proposed Action. There is no new surface disturbance proposed along the Mount Hope well field road, so there would be no additional loss of habitat associated with this alternative. However, impacts from vehicle related mortality could occur along this road. Mount Hope well field road would pass through different habitat than Roberts Creek Road (pinyon-juniper versus sagebrush). However, species likely to be impacted by vehicle collisions (mule deer, pronghorn, small mammals) would largely be similar.

Under this alternative, indirect effects to the leks along the Three Bars/Atlas Haul Road would be minor and impacts along the Roberts Creek Road would not occur. However, there would be

impacts to the Henderson Pass lek (located 0.12 miles from the Mount Hope well field road) in addition to the 20 leks identified within four miles of the alternative (excluding Roberts Creek Road). It is anticipated that as a result of its proximity to the road, the Henderson Pass lek would be lost under this alternative (i.e., greater sage-grouse would abandon this lek) as a result of daily traffic. Although the total number of leks impacted by this alternative is seven fewer than the Proposed Action, the magnitude of effect is considered greater since this alternative would result in the loss of a lek. Impacts to greater sage-grouse from this alternative are expected to be long-term may affect, and would likely adversely affect this lek. However, implementation of seasonal road timing restrictions for mine-related traffic along the access roads from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM from March 1 to May 15, impacts are expected to reduce impacts from this alternative.

4.21.5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts from this alternative would be the same as described for the Proposed Action.

4.21.5.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources from this alternative would be the same as described for the Proposed Action.

4.21.5.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity for this alternative would be the same as described for the Proposed Action.

4.21.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, construction and operation of the Project would not occur. As a result, most of the impacts discussed for the Proposed Action would not occur. However, exploration activities associated with this alternative would impact various types of wildlife habitat throughout the area of analysis. Impacts may include habitat avoidance, wildlife displacement to adjacent areas from noise and increased human presence, and vegetation removal. The Notice-level activities may occur within both PHMA and GHMA habitat for greater sage-grouse. The direct and indirect area of analysis for this alternative would continue to include approximately 654 acres of existing disturbance associated with past mining activities. Since the Proposed Action would not be constructed, no reclamation would occur on this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action). Loss of habitat from the reclaimed area would result in long-term impacts to primarily general wildlife, game species, migratory birds, raptors, and may affect, but would not adversely affect greater sage-grouse. This would primarily represent a loss in future foraging habitat for these species, and the impacts are expected to be long term and minor, due to the availability of other suitable habitat in adjacent areas, and may affect, but would not adversely affect sensitive species.

4.22 Wild Horses and Burros

4.22.1 Indicators

Indicators for impacts to wild horses focused on disturbance of Primary Use Areas and Areas of Concern, reductions in forage availability, and the acres of land to be disturbed within each HA and HMA. Additional indicators for impacts included current population status and AML for each HMA.

Effect Context for Wild Horses

Localized: Impacts would be limited to the Project area.

Regional: Impacts would extend beyond the Project boundary to the HMA.

Duration of Effects Definitions for Wild Horses and Burros

Short- term: Less than one year.

Long- term: Greater than one year

Intensity of Effects Definitions for Wild Horses

Negligible: Effects would not result in any perceptible changes to wild horse and burro utilization, distribution, and/or habitat.

Minor: Effects would result in minimally observable and/or measurable changes to wild horse and burro utilization, distribution, or habitat. The Project may result in a temporary displacement of animals. The animal use patterns and/or their habitat is expected to recover in a short period of time (within hours to days), without human intervention.

Moderate: Effects would result in observable and/or measurable changes to wild horse and burro, utilization, distribution, health, or habitat. The Project may result in displacement of some animals. The animal use patterns and/or habitat are expected to recover within several weeks to several months.

Major: Effects would result in marked changes to wild horse and burro, utilization, distribution, health, or habitat. The Project may result in displacement of some or all of the animals. The use patterns, distribution, health and/or their habitat could recover, but it would likely take a year or more with no guarantees of success.

4.22.2 Direct and Indirect Impacts of the Proposed Action

Direct impacts of the Proposed Action to wild horses include loss of habitat, a reduction in forage availability, and possible mortality or injury from vehicle collisions. The Proposed Action would have a long-term impact from removal of 718 acres of existing vegetation communities within the Plan boundary. Total disturbance within the Plan boundary would be 1,129 acres (not including existing non-MMI disturbance to be reclaimed), however, 395 acres is existing disturbance.

Removal of vegetation from construction of the mine facilities reduces the habitat and forage available for wild horses. Additionally, 127 acres would be fenced (consisting of the mining and processing facilities, the administration and process area, and at the generator and water storage area by GBPW-210), excluding use by wild horses, but also protecting them from potential harm in these areas. **Table 4.22-1** presents the acres of disturbance and reclamation by wild horse use area.

The effects would be moderate and localized within the immediate Project area, but minor on the regional HMA scale. The habitat is not highly valuable to wild horses due to pinyon and juniper cover, terrain and the existing disturbance from previous mining, and though wild horses move through the area, there is likely little reliance on the area for forage. Review of inventory records show few horses observed in the vicinity of the proposed mine operation, and field observations indicate incidental use as horses move through the area. No known watering sources are present within the Project area; therefore, the Proposed Action would not reduce access to water for wild horses.

The Atlas Haul Road would not require any additional disturbance, but haul traffic may impede wild horse travel within the Roberts Mountain Complex HMA, since this road bisects the northern portion and is located between two Primary Use Areas. The use of the Atlas Haul Road access route is expected to increase by 10 trips per day from large vehicle traffic, and could affect wild horses between the Three Bars Road and the Project boundary. Potential risks for injury or mortality from vehicle collisions would be reduced by the speed limit restrictions within the Plan boundary, including on access roads, new employee awareness training, signage at wild horse trails and the use of reflectors (Section 2.2.20).

With one estimated haul truck every two minutes, or 30 per hour on a 24-hour basis (Brennan, 2016) within the active mine area, there would be a high potential for injury to wild horses if they chose to continue to move through the area once actual mining activities begin. Close monitoring of wild horse presence within the mine area would be necessary to gauge the level of risk to wild horses as related to changes in their behavior as they become more acclimated to the mining activity. The risk to horses would be congruent with population size, and it is expected that when the population is reduced to the established AML, that few horses will move through the active mine area.

Similarly, increased light vehicle traffic on the Roberts Creek Road by an estimated 40 light vehicle trips per day, would increase the risk of vehicle collisions with wild horses. Signage, speed restrictions and the use of reflectors would help to reduce this risk.

Table 4.22-1 Wild Horse Resources Disturbed within the Plan Boundary[1]

Area	Acres within Plan Boundary	Proposed Disturbance (acres)[2]	Proposed Reclamation (acres)[2]	Proposed Permanent Disturbance (acres)
Roberts Mountain HA	5,281	1,064	910	154
Roberts Mountain HMA	31	11	11	0
Primary Use Areas	18	0	0	0
Areas of Concern	3,159	537	509	28

[1] Acreages in this table are not additive. Acreages are presented for the various horse management units, which have different spatial extents and are considered separate areas for analysis purposes.
[2] Disturbance acreage does not include 65 acres for exploration that could occur anywhere within the Plan Boundary, and would also be reclaimed.

Indirect impacts to wild horses would include displacement from the Project area and possible changes in use patterns principally due to the increased vehicle and haul traffic and mine activities (e.g., mine blasting), and increased presence of humans. Increased noise would be caused by generators at certain wells and at the generator plant. The operations at the heap leach pad, administration and process facilities would also increase noise levels. Haul trucks within the active mine area and traffic on the access roads would increase noise levels. Over time, wild horses may habituate to the traffic and mine activities and either continue using areas within the Project area or return to using these areas after being displaced for some amount of time. These effects would be long term, localized and moderate in the mining vicinity. Minor effects would be expected within the majority of the Roberts Mountain HMA and HA.

Use of the parking lot in the town of Eureka is anticipated to have no impacts on wild horses.

The majority of the Project area would not have exclusionary fencing and wild horses would be free to access undisturbed areas within the Plan boundary, as they currently are. Successful reclamation could also enhance the habitat and forage quality for wild horse use. It is possible that wild horses would be attracted to disturbed areas that are reseeded and where forage accessibility is increased such as along roadsides. Approximately 420 acres (including the approximately 25 acres of non-MMI disturbance that would be reclaimed) of existing disturbance would be reclaimed along with the current proposed disturbance, resulting in a long term, localized net benefit to habitat in the area.

Changes to wild horse distribution and use patterns are expected and could be moderate and long term within the project area (localized) and minor or negligible in the rest of the HMA (regional). East-west movement patterns north of the Roberts Creek Ranch near the southeast corner of the Project area would likely cease due to the construction and presence of the processing and administrative facilities, heap leach pad and fencing and security gates proposed in that area. It is unclear how much movement would still occur in the region in between the pits and the heap leach pad. Wild horses would still be able to move east and west within the HMA using routes in other parts of the HMA.

It is not expected that the Project would cause the need to reduce the wild horse AML or impact the genetic health of the population. The expected mine life is seven years (i.e., five years of active mining and leaching plus two years of residual heap leaching), with an anticipated six years of reclamation after cessation of active mining and residual heap leaching and approximately 4.5 years of post-closure monitoring.

4.22.2.1 Unavoidable Adverse Impacts

The Project would result in a loss of vegetation resources used by wild horses as forage. Additionally, unsuccessful or poor reclamation outcomes could result in less forage availability than prior to the disturbance. As stated above, the area is not relied upon heavily for forage by wild horses due to the terrain, existing disturbance and cover of pinyon and juniper.

4.22.2.2 Irreversible and Irretrievable Commitments of Resources

The Proposed Action would result in the irreversible loss of forage on 154 acres, due of unreclaimed disturbance. However, 87 acres (56 percent) of the unreclaimed disturbance is existing disturbance.

4.22.2.3 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses impacted by the Proposed Action include reduced access to the Project area to wild horses from the fenced area (127 acres) and possible avoidance due to increased vehicle and haul traffic and other mining-related anthropogenic activities. The majority of impacts to wild horses would be long-term because successful revegetation of disturbed areas could take several years after the cessation of mining. Successful reclamation of the disturbed areas could result in more productive rangeland and higher quality forage available for wild horses. Approximately 420 acres of existing disturbance from previous mining activities would be reclaimed, resulting in a net reduction of disturbed acres within the project area, and therefore resulting in a net long term benefit to the wild horse habitat.

4.22.3 Direct and Indirect Impacts of the 25 kV Overhead Distribution Line Alternative

Direct impacts to rangeland resources from the implementation of this alternative would include a potential reduction of forage available for wild horses and disturbance by increased human presence during construction. Additional impacts beyond those analyzed for the Proposed Action would be localized, short term and minor. Slight reductions in noise would occur as fewer generators would be in use at the processing facility due to the availability of electricity delivered to the site by the proposed distribution line. The potential for wild horse injury or mortality from vehicle collisions would be negligible as the access road would only be used when conducting maintenance on the power line. Potential impacts to wild horses would be greater during the construction phase of the power line and then lessen overtime. Revegetation would occur within the ROW area after construction. **Table 4.22-2** shows the potential impacts to wild horse resources from the implementation of the 25 kV overhead distribution line. Existing fences would remain in place, and where not currently present, gates would need to be placed where the maintenance access road crosses fence lines. No new fencing is proposed for this alternative.

Table 4.22-2 Wild Horse Resources Disturbed within the 25 kV Distribution Line ROW[1]

Management Unit	Proposed Permanent Disturbance 40-foot ROW (acres)
Areas of Concern	43
Primary Use Areas	28
Fish Creek South HMA	16
Roberts Mountain Complex	62
Diamond HA	4
Fish Creek HA	34
Kobeh Valley HA	42
Roberts Mountain HA	43

[1]Acreages in this table are not additive. Acreages are presented for the various horse management units, which have different spatial extents and are considered separate areas for analysis purposes.

Overall, impacts to wild horses from the 25 kV overhead distribution line (beyond those analyzed under the Proposed Action) would be short-term and minor.

4.22.3.1 Unavoidable Adverse Impacts

This alternative would result in a loss of vegetation resources for use as forage for wild horses.

4.22.3.2 Irreversible and Irretrievable Commitments of Resources

This alternative would result in the irretrievable loss of 130 acres of vegetation during the life of the distribution line. The distribution line would be fully reclaimed after closure of the Project so no additional irreversible commitment of resources would occur to wild horses under this alternative.

4.22.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses impacted by this alternative include possible avoidance of nearby areas during the construction phase due to increased vehicle and anthropogenic activities. Most impacts to wild horses would be short-term, lasting during construction and until revegetation is established.

4.22.4 Direct and Indirect Impacts of the Three Bars Road/Atlas Haul Road as Only Access Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, light vehicle traffic associated with mining operations would not use Roberts Creek Road, and all vehicle traffic, both light vehicle traffic and heavy vehicle traffic, would use Three Bars Road. However, North Roberts Creek Road would still be improved as detailed under the Proposed Action, in order to provide access for construction and maintenance of the water supply pipeline and production wells. The potential for vehicle-wild horse collisions may be increased along the Atlas Haul Road between the Three Bars road and the Project boundary, since the light-duty vehicle traffic would also be using this access road (40 light vehicle trips per day). No changes to speed limits are proposed for this alternative, so traffic would be subject to the same speed limits on these roads

as in the Proposed Action. Signage, personnel training, and reflectors would reduce risk of collisions due to increased traffic. Overall, impacts to wild horses from this alternative would be long-term, localized, and minor, the same as those described for the Proposed Action.

4.22.4.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.22.4.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources as those described for the Proposed Action are anticipated for this alternative.

4.22.4.3 Relationship of Short-Term Uses and Long-Term Productivity

No additional impacts to short-term use or long-term productivity as those described for the Proposed Action are anticipated for this alternative.

4.22.5 Direct and Indirect Impacts of the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Since mining and processing operations under this alternative would be the same as the Proposed Action, impacts would be the same as the Proposed Action. However, access under this alternative would use State Route 278, Mount Hope access road, and Mount Hope well field road to access the Project. NVN-091566 and North Roberts Creek Road would still be used to access the Project under this alternative, but Roberts Creek Road would not be used for access. No changes to speed limits are proposed for this alternative, so traffic would be subject to the same speed limits committed to in the Proposed Action. The disturbance acreage would remain the same as the Proposed Action, including the disturbance to North Roberts Creek Road. No improvements to Mount Hope mine access or well field roads are proposed for this alternative beyond what has previously been authorized with the Mount Hope Project. Impacts from Mount Hope roads were analyzed in the 2012 Mount Hope Project FEIS (BLM, 2012a). Potential impacts from vehicle-wild horse collisions may be reduced because the Mount Hope Project boundary would be fenced, excluding wild horses. However, this access road is not as straight as Roberts Creek or Three Bars Road, increasing opportunity for collisions due to reduced visual distance on corners, particularly in the area just west of the Roberts Creek Ranch where wild horse use has typically been common. Overall, impacts to wild horses from this alternative would be long-term, localized, and minor, the same as those described for the Proposed Action.

4.22.5.1 Unavoidable Adverse Impacts

No additional unavoidable adverse impacts to those described for the Proposed Action are anticipated for this alternative.

4.22.5.2 Irreversible and Irretrievable Commitments of Resources

No additional irreversible and irretrievable commitments of resources to those described for the Proposed Action are anticipated for this alternative.

4.22.5.3 Relationship of Short-Term Uses and Long-Term Productivity

No additional impacts to short-term use or long-term productivity to resources as those described for the Proposed Action are anticipated for this alternative.

4.22.6 Direct and Indirect Impacts of the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities (exploration) described in in Section 2.2.14. The existing conditions would include the existing approximately 654 acres of disturbance from the Atlas mining operations. Since the Project would not be approved under this alternative, no reclamation would occur on portions of this existing disturbance (approximately 420 acres of existing disturbance are proposed for reclamation under the Proposed Action), which may have a long-term impact on wild horses that may benefit from reclaiming these areas and potentially increasing forage area. No impacts to wild horses are expected from this alternative.

4.23 Introduction to Cumulative Effects Analysis

As required under the NEPA and the regulations implementing NEPA, this section analyzes potential cumulative impacts from past, present, and reasonably foreseeable future actions (RFFAs) combined with the Proposed Action within the Cumulative Effects Study Area (CESA) specific to the resources for which cumulative impacts may be anticipated. A cumulative impact is defined as “the impact which results from the incremental impact of the action, decision, or project when added to other past, present, and RFFAs, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). This analysis focuses on cumulative impacts of the Proposed Action and other actions both within and outside of the Proposed Action area. Major past and present land uses and disturbances within the resource CESAs that are projected to continue into the future include mineral development and exploration, utilities, infrastructure and public purpose projects, roads, wildland fires, livestock grazing, agriculture, and mining. Dispersed recreation (including hunting, fishing, and OHV use) and residential development also occur and are expected to continue in portions of the CESAs.

The boundaries of the CESAs vary by resource. Cumulative effects should be evaluated in terms of the specific resource, ecosystem, and human community being impacted. To determine the size of the CESAs, each environmental resource was analyzed to the extent to which the environmental effect from the Project could be reasonably detected and the geographic area impacted was defined.

Impacts must first be identified from the Proposed Action before cumulative impacts with other actions can occur (BLM, 2008a). The same process was applied for the action alternatives. Impacts from the action alternatives were identified as part of the cumulative impact analysis.

For the purposes of this analysis and under federal regulations, “impacts” and “effects” are assumed to have the same meaning and are interchangeable. The cumulative effects analysis was accomplished through the following steps:

- Step 1: Establish appropriate geographical area CESAs for analysis by resource;
- Step 2: Identify the past, present, and RFFAs relevant to the resources in the CESAs;
- Step 3: Summarize the effects of the Proposed Action and alternatives in conjunction with past, present, proposed, and RFFAs; and
- Step 4: Provide a cumulative impacts analysis and discussion.

Information utilized in the cumulative impacts analysis was gathered from the following sources: BLM’s LR2000, BLM’s Land Records Search (Master Title Plats), GIS shapefiles provided by the BLM and the client, aerial photography, and existing EA and EIS documents.

Environmental consequences of the Proposed Action and action alternatives are described in Sections 4.2 through 4.22. Based upon the analysis conducted for each resource, it was determined necessary to analyze cumulative impacts for all the resources.

The geographical areas considered for the analysis of cumulative effects are illustrated on the CESA figures for each resource as described in **Table 4.23-1**. The CESA boundaries vary in size and shape to reflect each evaluated resource. **Table 4.23-1** outlines the CESAs and their sizes.

Table 4.23-1 Cumulative Effects Study Area by Resource

Resource	Cumulative Effects Study Area	Size of Area (acres)	Figure
Air Quality, Soil, Vegetation, Forest Products, Water Resources, Wetlands, and Riparian Zones	Includes the Kobeh Valley Hydrographic Basin (#139) and the Diamond Valley Hydrographic Basin (#153), and extends six miles (10 kilometers) north of the Kobeh Valley Hydrographic Basin.	1,120,249	Figure 4.23-1
Cultural, Paleontology, Historic Trails, Native American Cultural Concerns, and Visual Resources	Includes the viewshed of the Project as represented by the Project Key Observation Points.	1,284,958	Figure 4.23-2
Geology and Minerals	The Antelope Mining District.	82,865	Figure 4.23-3

Resource	Cumulative Effects Study Area	Size of Area (acres)	Figure
Hazardous Materials and Waste	Includes the Plan boundary and includes the associated access roads, and the potential transportation routes to the Plan boundary from the following major hubs from which materials would be transported: • From Reno east via Interstate 80 to the intersection with State Route 278, then State Route 278 south to the intersection with U.S. Highway 50, and U.S. 50 west to the Project's access roads; • From Elko west via Interstate 80 to the intersection with State Route 278, then State Route 278 south to the intersection with U.S. Highway 50, and U.S. 50 west to the Project's access roads; • From Fernley east via U.S. Highway 50 to the Project's access roads; and • From Eureka west via U.S. Highway 50 to the Project's access roads.	Acreage is not applicable to this CESA, because it consists of the linear transportation routes (approximately 640 miles) to the Plan boundary.	Figure 4.23-4
Land Use, Access, Recreation, and Transportation	Includes the portion of Eureka County that is within the Shoshone-Eureka Resource Management Plan from its northern border in Eureka County to U.S. Highway 50 at the south. The CESA also includes a 1,000-foot buffer of the portion of the 25 kV Distribution Line Alternative south of U.S. Highway 50. This CESA includes U.S. Highway 50 from the Township of Eureka to the Eureka County/Lander County border, and all Project access roads.	1,086,663	Figure 4.23-5
Grazing Management	Includes the Ruby Hill, Lucky C, Roberts Mountain, Willow Ranch, Three Bars, Santa Fe/Ferguson, and Shannon Station Allotments.	556,125	Figure 4.23-6
Socioeconomics and Environmental Justice	Eureka County.	2,673,325	Figure 4.23-7

Resource	Cumulative Effects Study Area	Size of Area (acres)	Figure
Big Game	Includes Area 14 and Area 15 Management Units which includes Management Units 141-145 and 151-156.	5,511,579	Figure 4.23-8
General Wildlife, Migratory Birds, and Raptors	Includes the Kobeh Valley Hydrographic Basin (#139), the Pine Valley Hydrographic Basin (#53), a two-mile buffer (one mile on each side of center line) around the portion of the 25 kV Distribution Line Alternative that is outside of Hydrographic Basin #139, and a 10-mile buffer around the Plan area for migratory birds. Includes the Roberts Mountains within the Project area as well as the Kobeh Valley.	1,217,559	Figure 4.23-9
Sensitive Wildlife Species (Greater Sage-Grouse) and Noise	Includes the Diamond and Three Bar Population Management Units (PMUs).	1,631,044	Figure 4.23-10
Wild Horses	Includes the Roberts Mountain, Whistler Mountain, and portions of the Fish Creek HMAs, as well as portions of the Kobeh Valley and Roberts Mountain HAs where wild horses exist based on past inventories, and where they could be potentially affected by the Project. The boundary also includes a 1,000-foot buffer of the 25 kV Distribution Line Alternative.	284,008	Figure 4.23-11

4.23.1 Time Frame for Analysis

Past, present, and RFFAs were analyzed using BLM's LR2000 records and aerial photography. Mining activities associated with the Proposed Action and action alternatives would occur for seven years (i.e., five years of active mining and leaching plus two additional years of residual heap leaching), and the majority of adverse impacts would dissipate after reclamation is completed. Therefore, a temporal extent of 10 years after cessation of active mining and residual heap leaching was used for the cumulative impacts analysis. This temporal extent was used because it represents the time-frame when revegetation, reclamation, and closure is expected to be completed, which is estimated to be six years after cessation of active mining and residual heap leaching. Furthermore, the groundwater model shows full recovery (estimated at approximately 99 percent) of the estimated drawdown after two years of cessation of groundwater pumping at the production wells (SRK, 2014b). The CEQ regulations do not require agencies to catalogue or exhaustively list and analyze past actions. In compliance with CEQ regulations, only past actions that have resulted in present impacts were considered in this cumulative impacts analysis. Present actions that are considered include those that have existing and/or ongoing disturbance. The temporal extent of 10 years includes RFFAs that extend past the completion of mining activities.

4.23.2 Past, Present, Reasonably Foreseeable Future Actions, Disturbances, and Projects

Projects are defined for this section of this EIS as activities that could interact with the Proposed Action and action alternatives in a manner that would result in cumulative impacts. Projects have been grouped as past, present, and RFFAs. The projects are listed in **Table 4.23-2** and described below. Surface disturbance characteristics were selected to describe the projects because it allows the combined surface disturbance impacts of all projects to be totaled; thus providing a quantitative analysis for most resources. However, acres of disturbance are not applicable to socioeconomics, environmental justice, or hazardous materials and waste; therefore, impacts to those resources are discussed qualitatively.

4.24 Past Actions

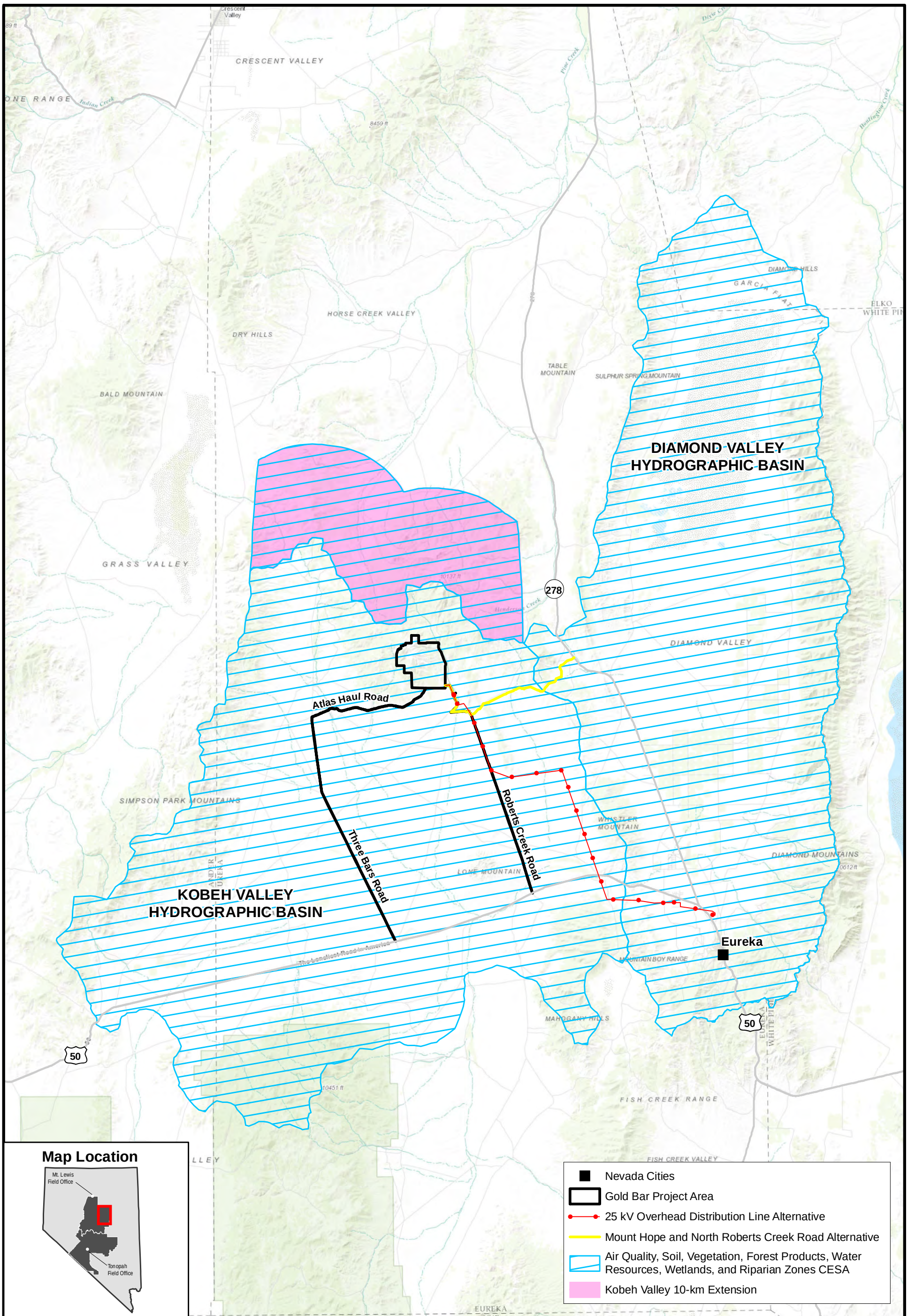
4.24.1 Mineral Development and Exploration

Several past mining activities have occurred within the CESAs in which authorizations have either closed or expired. According to LR2000, closed applications for past mining activities have either been reclaimed, or the disturbance has been included in an existing plan of operations. Since most past mining activities have been reclaimed, or they are in various stages of natural reclamation, their cumulative impact on current conditions is decreased in magnitude. However, past mining disturbance was included in **Table 4.23-2** because some residual cumulative impacts may result from these past mining activities. These past disturbances are all grouped as “mining and exploration project” under past actions on **Table 4.23-2**. Some of the past closed or expired mining authorizations that have occurred within the CESAs are:

- The Atlas Mine and Mill Site, including several previous exploration activities associated with Atlas’ operations in the project area;
- New York Canyon Exploration Project;
- Roberts Mountain Drilling Project;
- Glister Heap Project;
- Mineral Point Exploration Drilling Project;
- Jewell Exploration Project;
- Ratto Canyon Drilling Project;
- Red Canyon Exploration Project;
- Hanson/Imperial Project;
- Cortez Mine exploration operations;
- Pediment Mining Project; and
- Triplet Gulch Mine.

Sand and Gravel Operations

There are numerous past permitted sand and gravel operations within the CESA boundary that are closed (BLM, 2016c). Although it is understood these past gravel pits are in various stages of reclamation, the full permitted acreage was included in the table.



Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 6 12 Miles
1 in = 6 miles

N

AIR QUALITY, SOIL, VEGETATION, FOREST PRODUCTS, WATER RESOURCES, WETLANDS, AND RIPARIAN ZONES CESA

FIGURE 4.23-1

REVISION NO. **A**

1/31/2017

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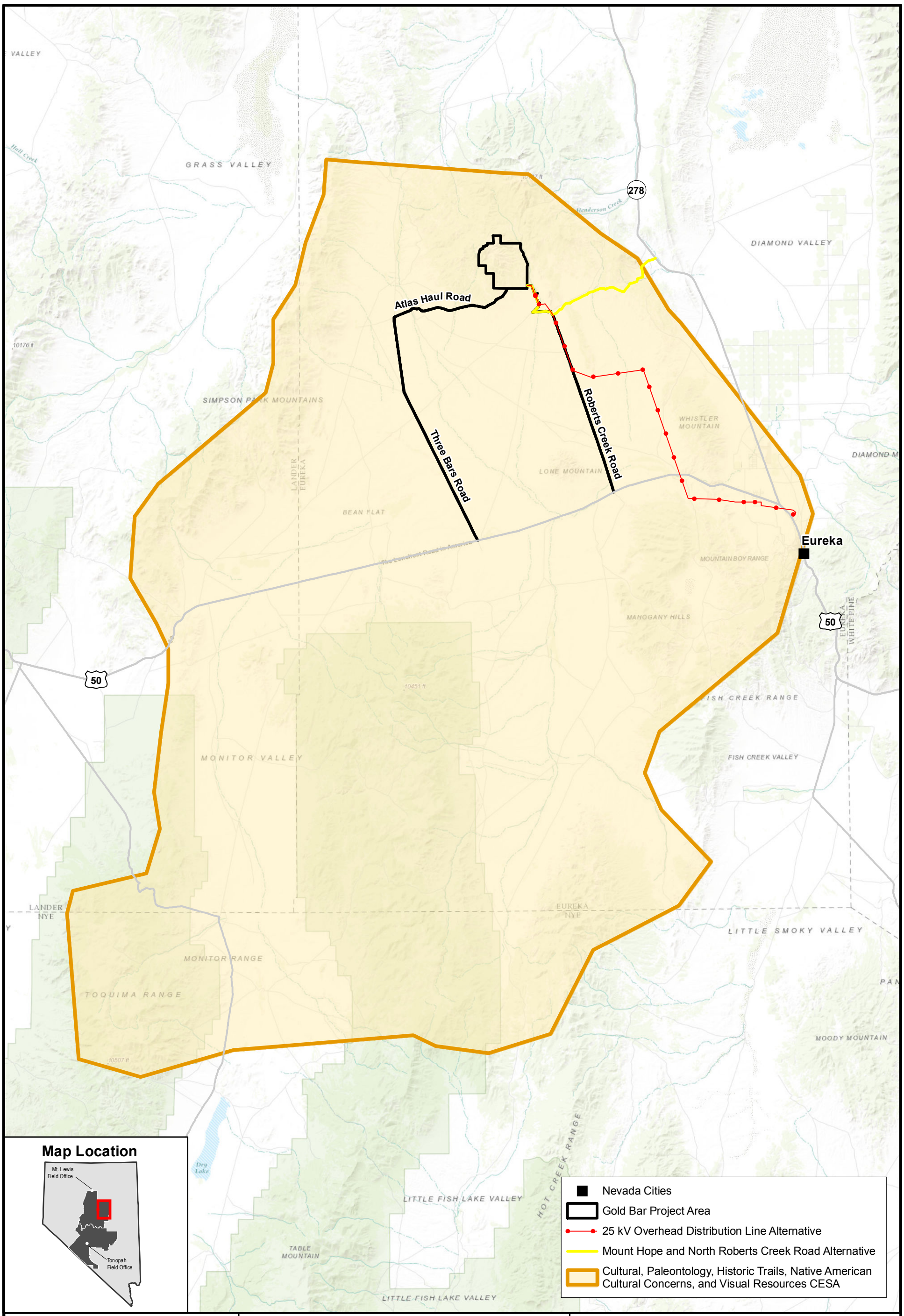

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 6 12 Miles
1 in = 6 miles

N

CULTURAL, PALEONTOLOGY, HISTORIC TRAILS, NATIVE AMERICAN CULTURAL CONCERNS, AND VISUAL RESOURCES CESA

FIGURE 4.23-2

REVISION NO. **A**

1/31/2017

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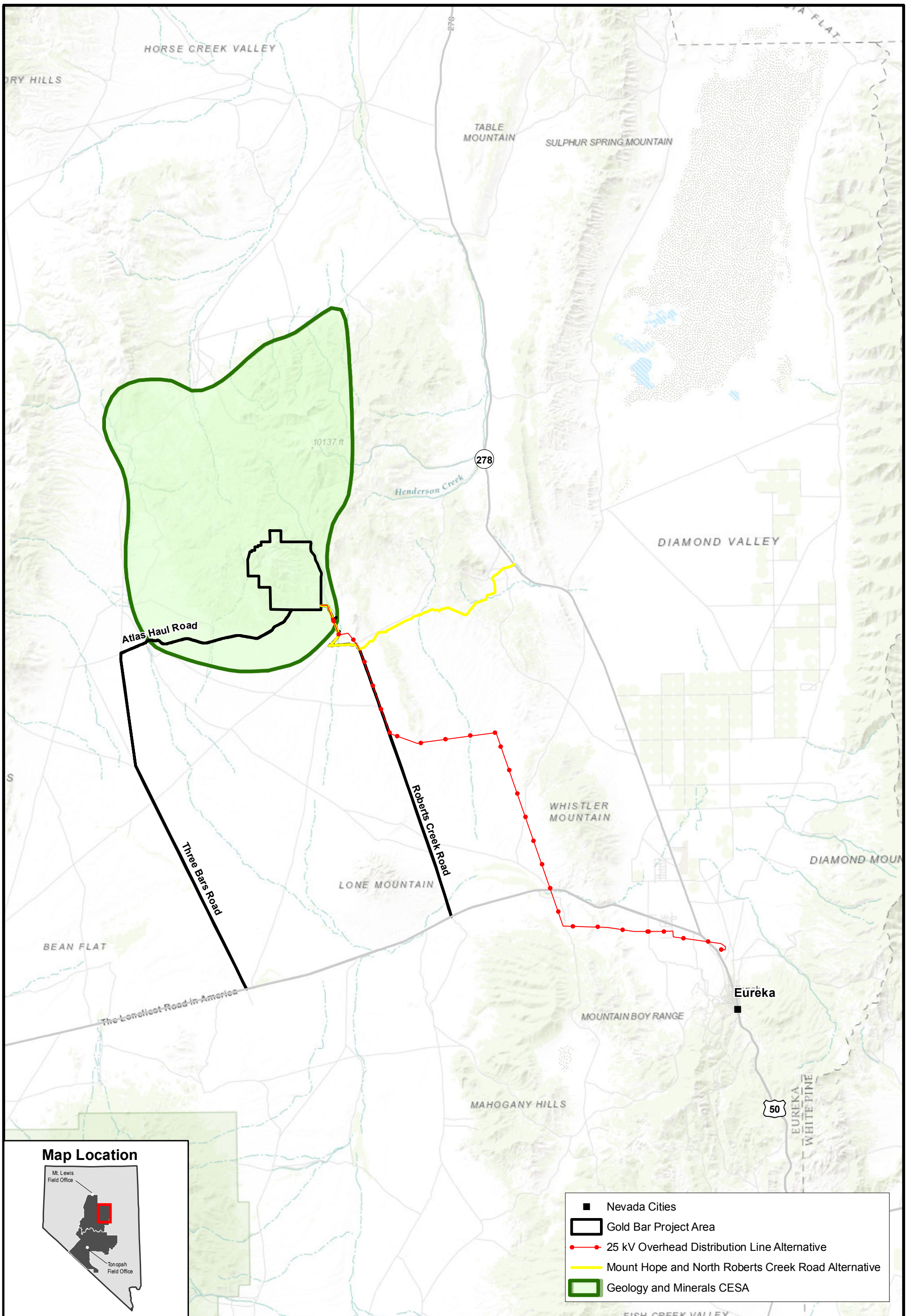

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 4 8 Miles
1 in = 4 miles
N

GEOLOGY AND MINERALS CESA

FIGURE 4.23-3

REVISION NO.
A

1/31/2017

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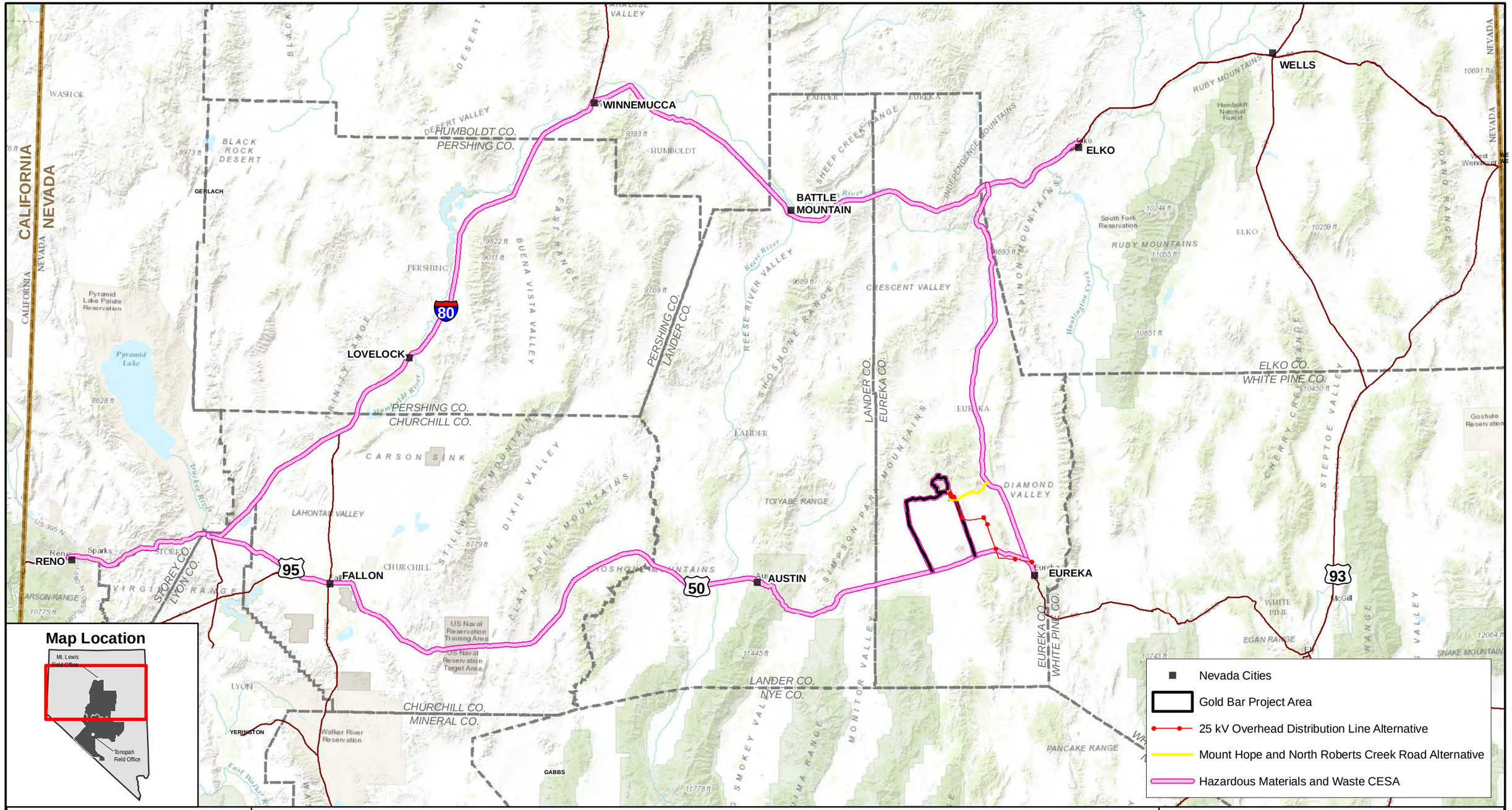

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 20 40 Miles
1 in = 20 miles

N

HAZARDOUS MATERIALS AND WASTE CESA

FIGURE 4.23-4

REVISION **A**

1/31/2017

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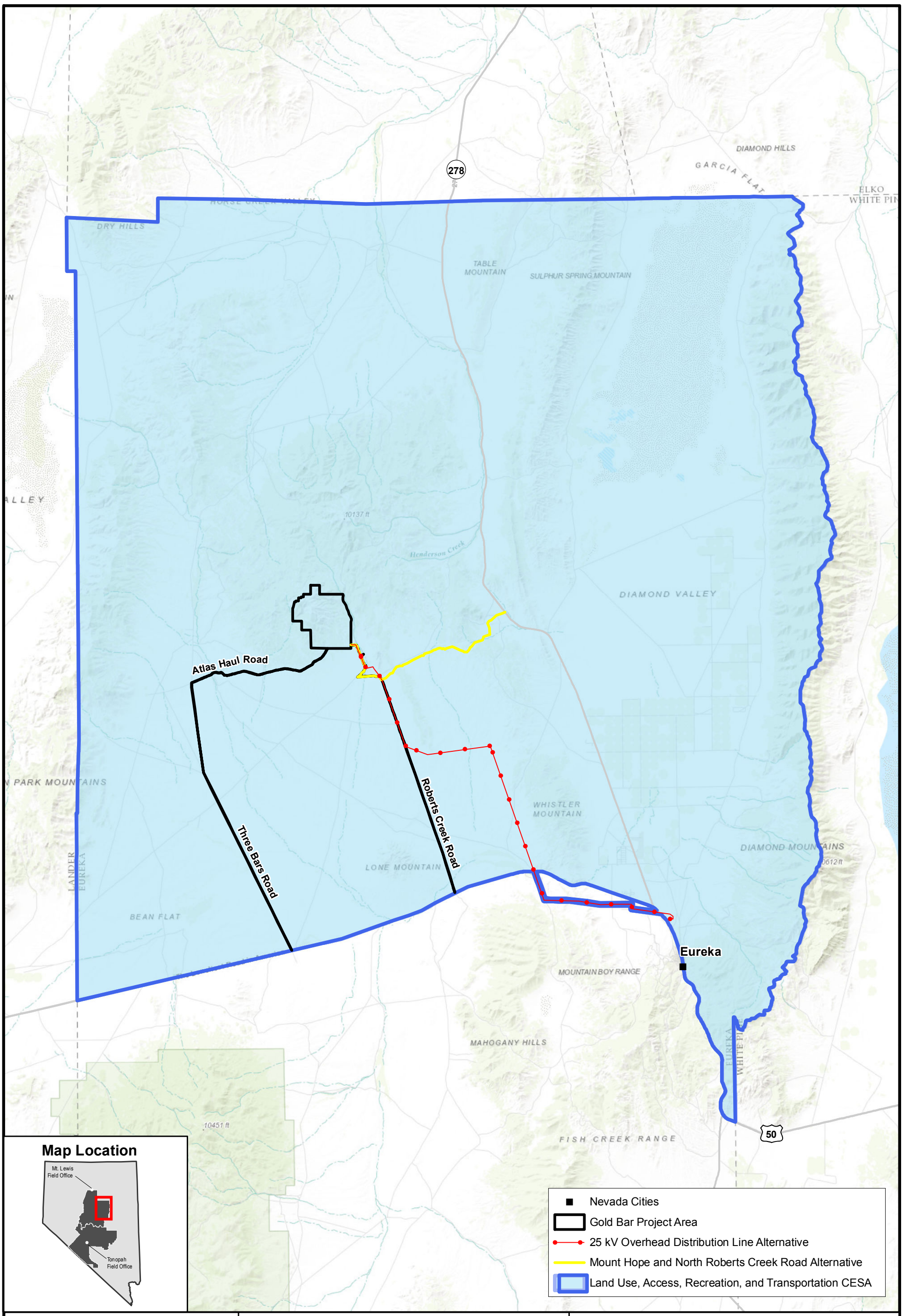

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 5 10 Miles
1 in = 5 miles

N

LAND USE, ACCESS, RECREATION, AND TRANSPORTATION CESA

FIGURE 4.23-5

REVISION NO.
A

1/31/2017

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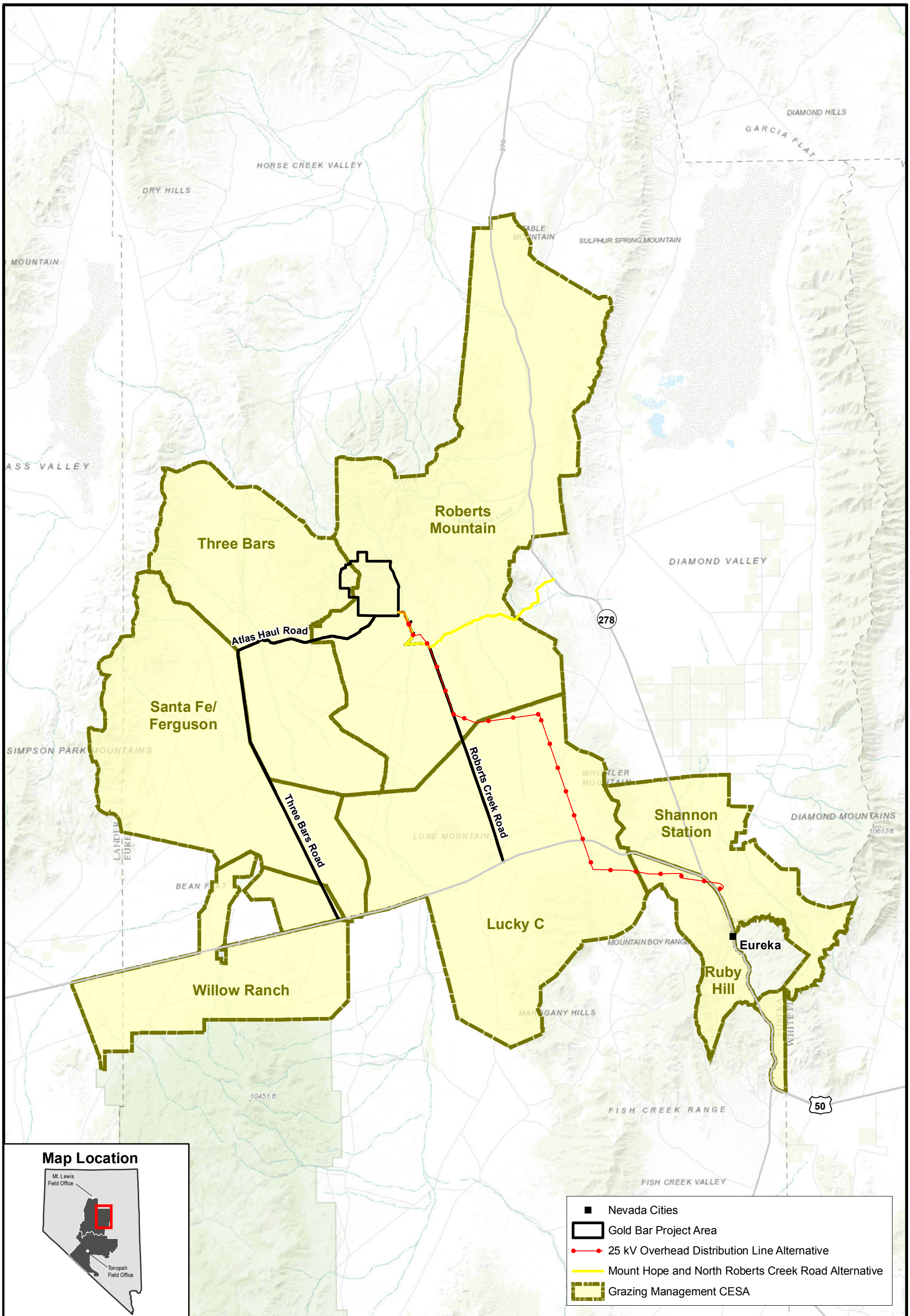

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 5 10 Miles
1 in = 5 miles
N

GRAZING MANAGEMENT CESA

FIGURE 4.23-6

REVISION NO. **A**

1/31/2017

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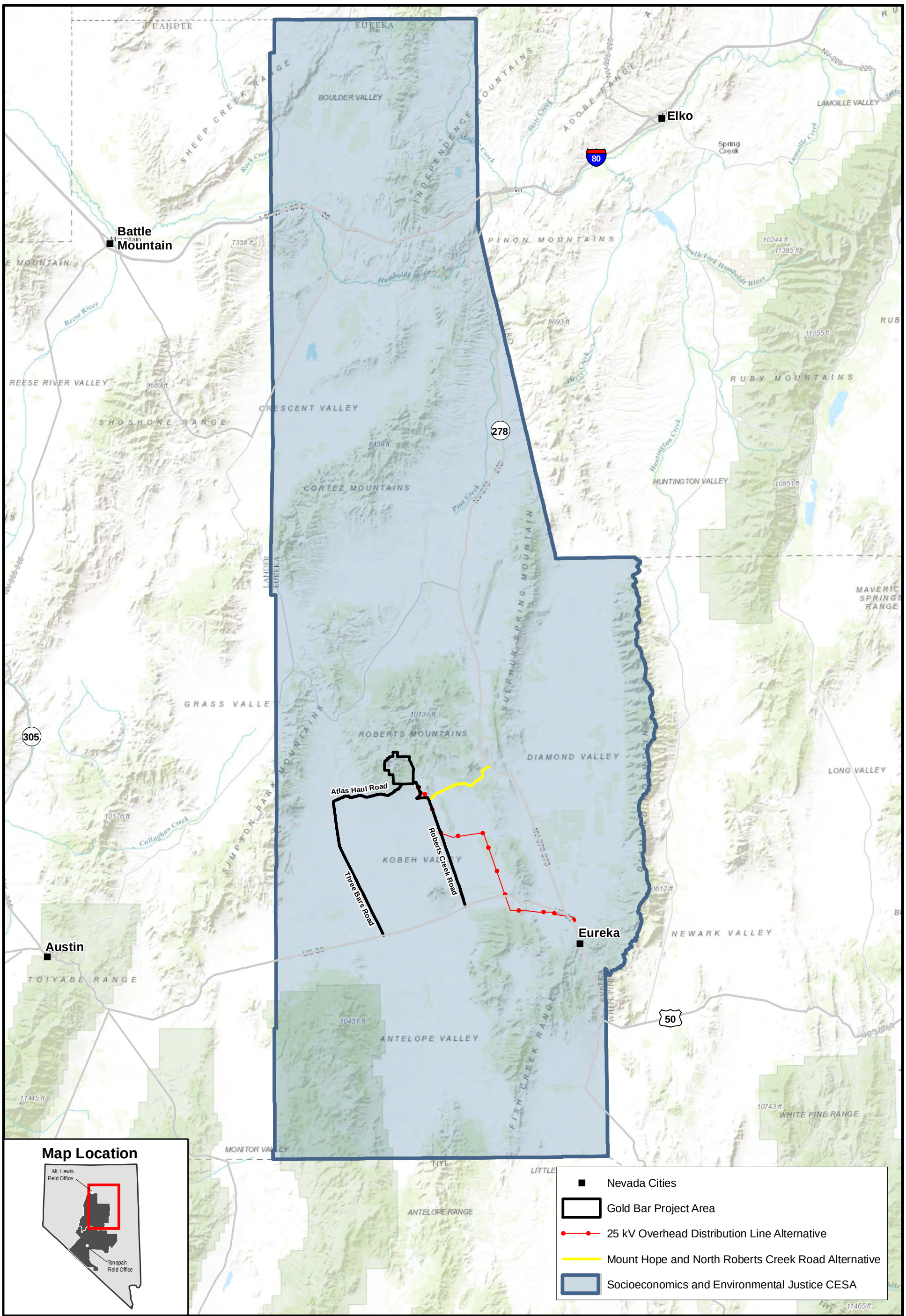

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 10 20 Miles
1 in = 10 miles

N

SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE CESA

FIGURE 4.23-7

REVISION **A**

1/31/2017

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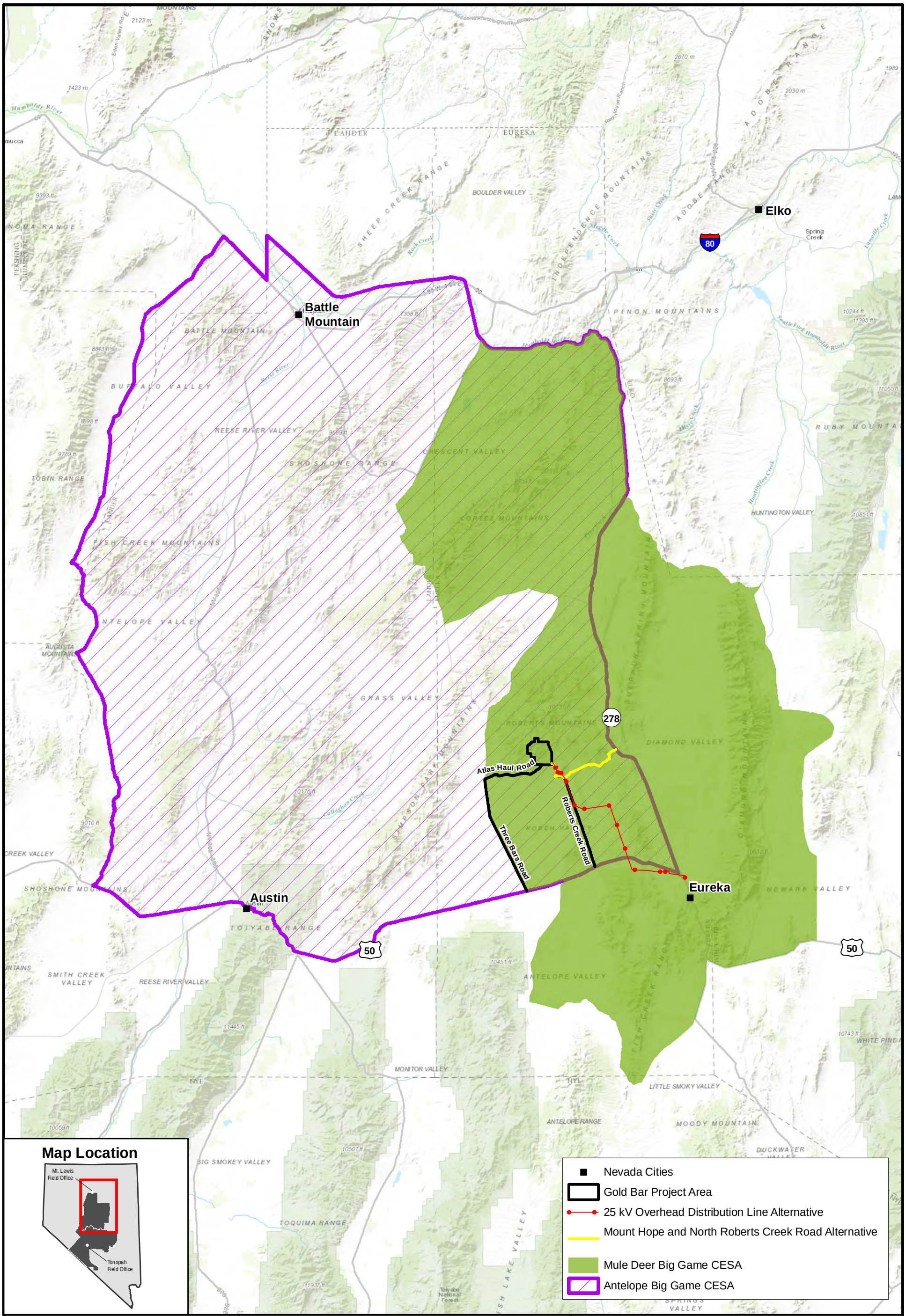

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 12 24 Miles
1 in = 12 miles

N

BIG GAME CESA

FIGURE 4.23-8

1/31/2017

REVISION NO.
A

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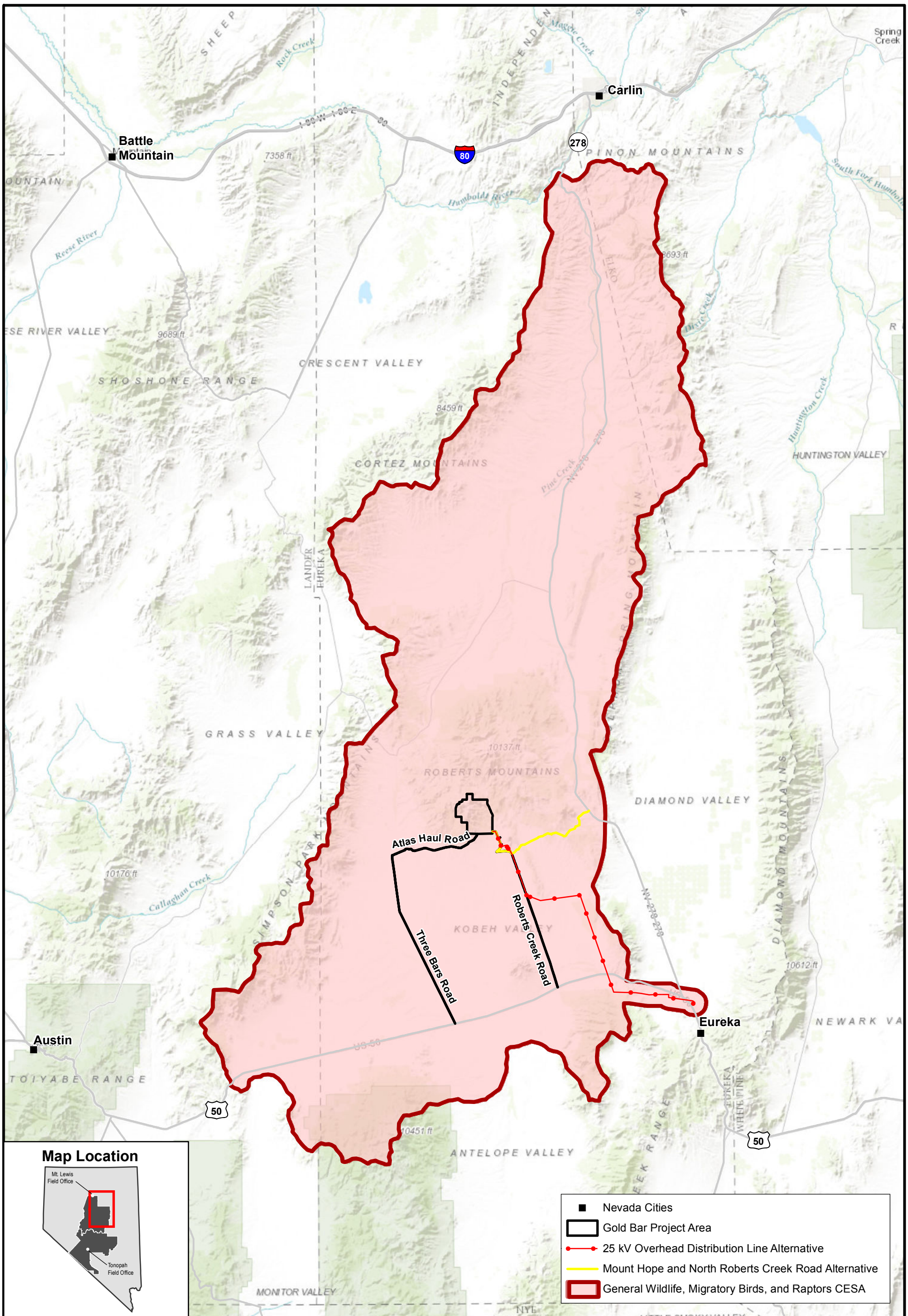

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 8 16 Miles
1 in = 8 miles

N

GENERAL WILDLIFE, MIGRATORY BIRDS, AND RAPTORS CESA

FIGURE 4.23-9

REVISION NO. **A**

2/1/2017

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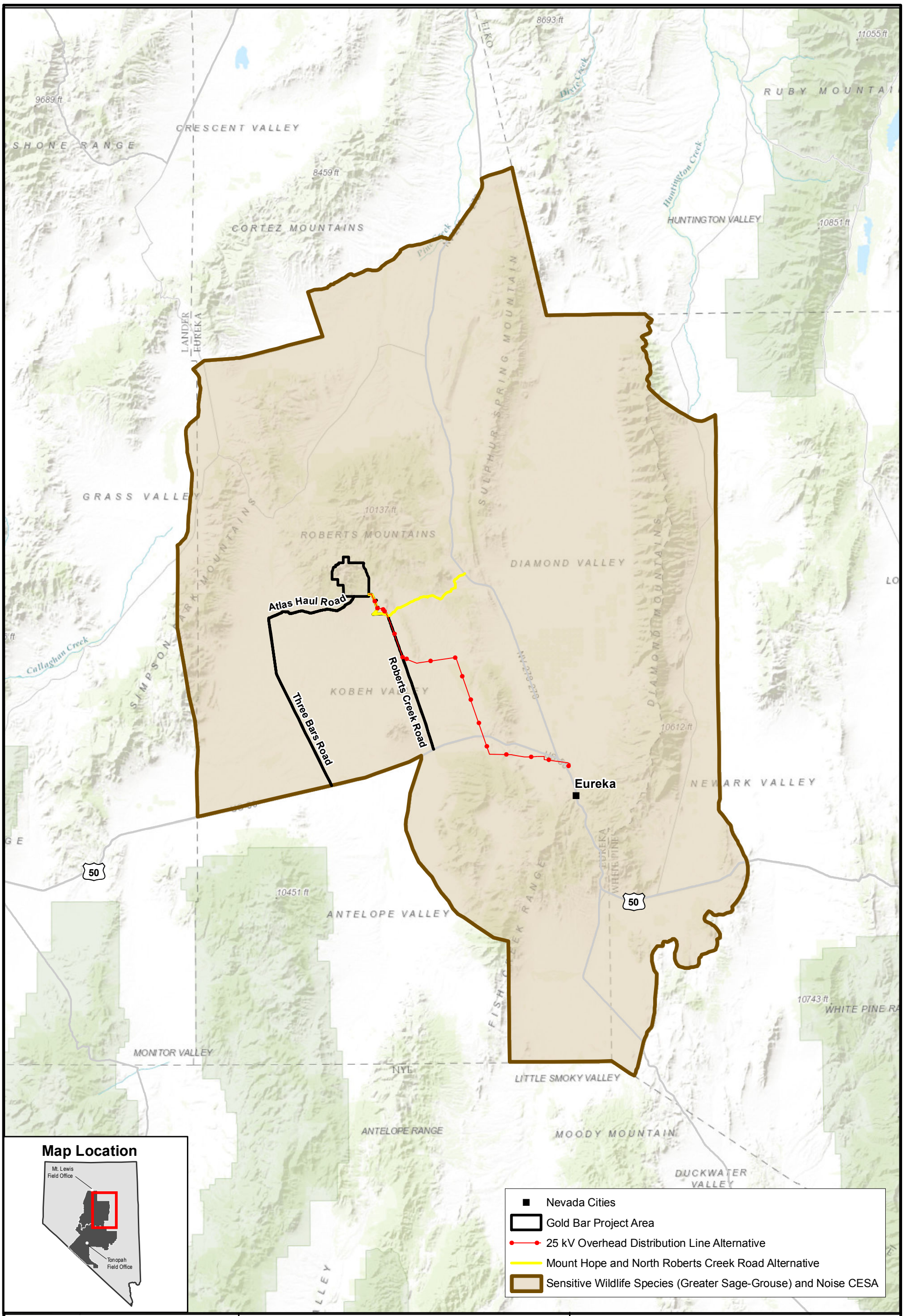

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 8 16 Miles
1 in = 8 miles

N

SENSITIVE WILDLIFE SPECIES (GREATER SAGE-GROUSE) AND NOISE CESA

FIGURE 4.23-10

REVISION NO. **A**

1/31/2017

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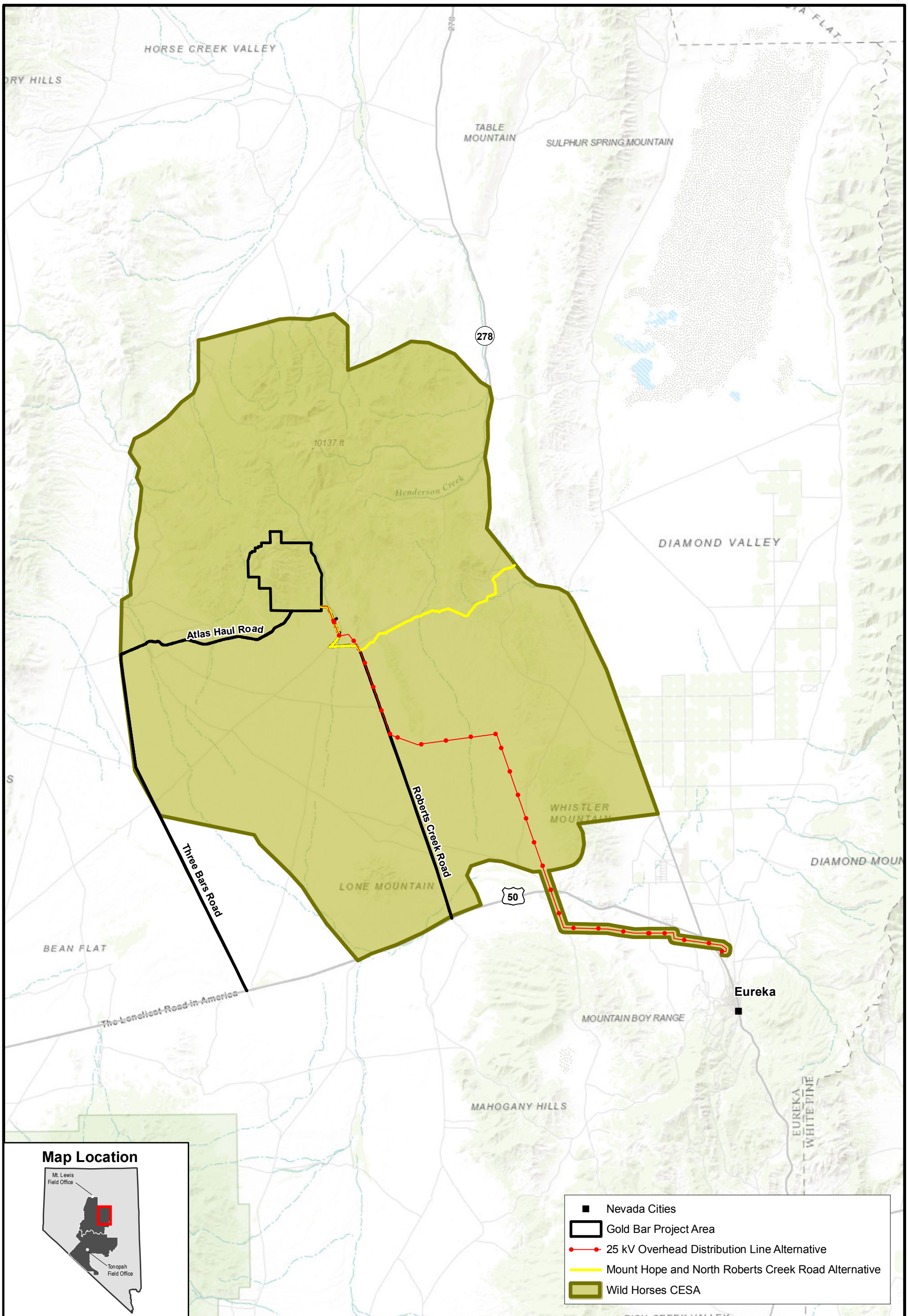

Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

0 4 8 Miles
1 in = 4 miles
N

WILD HORSES CESA

FIGURE 4.23-11

REVISION NO.
A

1/31/2017

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Table 4.23-2 Past, Present, and Reasonably Foreseeable Future Actions for the Gold Bar Mine Project CESA (surface disturbance in acres)

Past, Present, and Reasonably Foreseeable Future Actions, Disturbances and Projects	Air Quality, Soil, Vegetation, Forest Products, and Water Resources	Cultural, Paleontology, Historic Trails, and Visual Resources	Geology and Minerals	Land Use, Access, Recreation, and Transportation	Range Resources	Pronghorn Antelope	Mule Deer	General Wildlife, Migratory Birds, and Raptors	Greater Sage-Grouse	Wild Horses
CESA Acres	**1,120,249**	**1,284,958**	**82,865**	**1,086,663**	**556,125**	**3,584,126**	**1,927,453**	**1,217,559**	**1,631,044**	**284,008**
Past Actions										
Mineral Development and Exploration Past Actions										
Mining and Exploration Projects	1,733	1,190	1,540	2,424	1,209	14,734	9,969	2,685	3,946	995
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,935	924	2	2,006	1,446	4,232	2,631	1,453	2,648	585
Notice of Intents	721	913	195	744	461	2,646	1,095	982	984	333
Utilities, Infrastructure, and Public Purpose Past Actions										
Railroads	NA	NA	NA	NA	NA	117	34	NA	NA	NA
Roads Past Actions										
Interstate Highways	NA	NA	NA	NA	NA	2,462	NA	NA	NA	NA
U.S. Highways	605	577	NA	402	475	360	450	530	575	18
State Routes	156	116	NA	290	162	827	657	417	569	92
Local/County Routes	NA	NA	NA	NA	NA	15	NA	NA	NA	NA
Others Roads	3,677	3,282	163	3,677	1,881	10,683	7,011	3,607	5,717	774
Wildland Fires, Restoration, and Seeding Past Actions										
Wildland Fires	13,765	1,222	2,292	17,930	6,767	236,229	81,204	67,211	30,668	8,215
Past Actions Total Disturbance Acres	**22,592**	**8,224**	**4,192**	**27,473**	**12,401**	**272,305**	**103,051**	**76,885**	**45,107**	**11,012**
Present Actions										
Mineral Development and Exploration Present Actions										
NOIs	63	76	14	51	47	88	76	63	66	29
Mining and Exploration Projects	29	181	125	385	181	2,118	505	561	410	146
Mount Hope	420	385	NA	420	NA	420	420	420	420	420
Tonkin Springs Mine and Exploration Operations	470	NA	469	470	NA	469	NA	469	469	21
Ruby Hill Mine	745	745	NA	NA	745	NA	745	272	745	NA
Pan Mine	NA	NA	NA	NA	NA	NA	NA	NA	1,007	NA
Marigold Mine	NA	NA	NA	NA	NA	4,866	NA	NA	NA	NA
Trenton Canyon Mine	NA	NA	NA	NA	NA	969	NA	NA	NA	NA
Cortez Mine (Including Horse Canyon)	NA	NA	NA	NA	NA	17,806	8,132	NA	NA	NA
Greystone Mine	NA	NA	NA	NA	NA	245	NA	NA	NA	NA
McCoy Cove Mine and Exploration	NA	NA	NA	NA	NA	4,555	NA	NA	NA	NA
Argenta Mine and Exploration	NA	NA	NA	NA	NA	567	NA	NA	NA	NA
Mule Canyon Mine	NA	NA	NA	NA	NA	1,400	NA	NA	NA	NA
Phoenix Mine	NA	NA	NA	NA	NA	1,909	NA	NA	NA	NA
Buckhorn Mine	NA	NA	NA	NA	NA	465	465	465	NA	NA
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	1,465	667	NA	1,609	1,230	4,335	2,787	1,151	2,630	657

Past, Present, and Reasonably Foreseeable Future Actions, Disturbances and Projects	Air Quality, Soil, Vegetation, Forest Products, and Water Resources	Cultural, Paleontology, Historic Trails, and Visual Resources	Geology and Minerals	Land Use, Access, Recreation, and Transportation	Range Resources	Pronghorn Antelope	Mule Deer	General Wildlife, Migratory Birds, and Raptors	Greater Sage-Grouse	Wild Horses
CESA Acres	**1,120,249**	**1,284,958**	**82,865**	**1,086,663**	**556,125**	**3,584,126**	**1,927,453**	**1,217,559**	**1,631,044**	**284,008**
Utilities, Infrastructure, and Public Purpose Present Actions										
Falcon to Gonder 345 kV Transmission Line	683	524	NA	1,050	997	1,834	2,141	1,472	1,360	654
Mount Hope 230 kV Transmission Line (Permanent and Temporary ROWs)	1,780	1,780	NA	1,780	1,721	1,627	1,780	1,780	1,780	1,722
Atlas 25 kV Overhead Distribution Line	72	72	3	72	72	72	72	72	72	72
Other Power Lines	1,347	934	43	1,104	756	3,972	1,784	1,139	1,914	139
Telephone and Fiber Optic Lines	448	301	NA	395	391	1,137	796	423	664	197
Communication Sites	66	64	NA	3	60	232	65	4	64	NA
Water Pipelines and Water Infrastructure	298	448	43	234	169	412	734	191	550	66
Eureka County Sewage Treatment Facility	80	NA	NA	80	80	NA	80	80	80	NA
Eureka County Volunteer Fire Station	5	NA	NA	5	5	5	5	NA	5	NA
Crescent Valley Airport	NA	NA	NA	NA	NA	373	373	NA	NA	NA
Oil, Gas, and Geothermal Development Present Actions										
Oil Gas and Geothermal Development	NA	NA	NA	NA	NA	376	7	NA	9	NA
Urban Development Present Actions										
The Town of Eureka, NV	736	615	NA	273	730	NA	736	145	736	NA
Battle Mountain, NV	NA	NA	NA	NA	NA	2,304	NA	NA	NA	NA
Austin, NV	NA	NA	NA	NA	NA	375	NA	NA	NA	NA
Diamond Valley, NV (including surrounding agricultural land)	36,120	3,125	NA	36,120	4,349	2,274	36,120	280	36,120	NA
Beowawe, NV	NA	NA	NA	NA	NA	640	320	NA	NA	NA
Recreation Present Actions										
Hickison Petroglyph Recreation Area	NA	400	NA	NA	NA	400	NA	400	NA	NA
Mill Creek Recreation Site	NA	NA	NA	NA	NA	300	NA	NA	NA	NA
Copper Basin Mountain Bike Trail	NA	NA	NA	NA	NA	77	NA	NA	NA	NA
Shoshone Mountain Range OHV Trail System	NA	NA	NA	NA	NA	20	NA	NA	NA	NA
Present Actions Total Disturbance Acres	**44,827**	**10,317**	**697**	**44,051**	**11,533**	**56,642**	**58,143**	**9,387**	**49,101**	**4,123**
Reasonably Foreseeable Future Actions										
Mineral Development and Exploration Reasonably Foreseeable Future Actions										
NOI	3.5	NA	NA	4	3	17	3.5	7	4	NA
Sand and Gravel Operations, Materials Sites and Community Sand and Gravel Pits	614	265	NA	565	512	283	1,029	433	671	NA
Mount Hope	7,887	7,921	NA	7,887	NA	7,887	7,887	7,887	7,887	7,887
Phoenix Mine	NA	NA	NA	NA	NA	3,507	NA	NA	NA	NA
Cortez Mine	NA	NA	NA	NA	NA	3,618	NA	NA	NA	NA
Toiyabe JV Mine Project	NA	NA	NA	NA	NA	635	NA	NA	NA	NA
Trenton Canyon Mine	NA	NA	NA	NA	NA	664	NA	NA	NA	NA
Norse Windfall Exploration Project	11	11	NA	NA	11	NA	11	NA	11	NA

Past, Present, and Reasonably Foreseeable Future Actions, Disturbances and Projects	Air Quality, Soil, Vegetation, Forest Products, and Water Resources	Cultural, Paleontology, Historic Trails, and Visual Resources	Geology and Minerals	Land Use, Access, Recreation, and Transportation	Range Resources	Pronghorn Antelope	Mule Deer	General Wildlife, Migratory Birds, and Raptors	Greater Sage-Grouse	Wild Horses
CESA Acres	**1,120,249**	**1,284,958**	**82,865**	**1,086,663**	**556,125**	**3,584,126**	**1,927,453**	**1,217,559**	**1,631,044**	**284,008**
Gold Canyon	119	NA	119	119	119	119	119	119	119	119
Little Guy Claims Project	3	NA	NA	3	NA	NA	3	NA	3	NA
Windfall Project	150	150	NA	150	150	NA	150	150	150	150
Prospect Mountain Drilling Project	25	25	NA	NA	25	NA	25	NA	25	NA
Atlas Gold Bar Exploration Drilling Project	597	597	597	597	597	597	597	597	597	597
Antler Peak Exploration	NA	NA	NA	NA	NA	16	NA	NA	NA	NA
Mud Springs Drilling Project	NA	NA	NA	NA	NA	10	NA	NA	NA	NA
Pleasant View Mine	NA	NA	NA	NA	NA	41	NA	NA	NA	NA
Independence Mine	NA	NA	NA	NA	NA	50	NA	NA	NA	NA
Fire Creek Mine	NA	NA	NA	NA	NA	135	NA	NA	NA	NA
Scruffy Oz Mine and Exploration Project	NA	NA	NA	NA	NA	2,180	NA	NA	NA	NA
Monarch Mill Site	NA	NA	NA	NA	NA	94	NA	NA	NA	NA
Slaven Canyon Mine	NA	NA	NA	NA	NA	78	NA	NA	NA	NA
Westside Exploration Project	NA	NA	NA	NA	NA	50	NA	NA	NA	NA
Mill Creek Exploration Project	NA	NA	NA	NA	NA	720	NA	NA	NA	NA
Shasta Project	NA	NA	NA	NA	NA	210	NA	NA	NA	NA
Gibellini Project	NA	730	NA	NA	NA	NA	730	NA	730	NA
Gunman Project	NA	NA	NA	NA	NA	NA	7	NA	NA	NA
Pan Mine	NA	NA	NA	NA	NA	NA	NA	NA	2,231	NA
Marigold Mine	NA	NA	NA	NA	NA	1,318	NA	NA	NA	NA
Utilities, Infrastructure, and Public Purpose Reasonably Foreseeable Future Actions										
Telephone and Fiber Optic Lines and Communication Sites	0.5	NA	NA	NA	NA	4	1	2	0.5	NA
Other Powerlines	10	NA	NA	NA	10	69	164	NA	164	NA
Water Pipelines and Water Infrastructure	NA	NA	NA	NA	NA	1	0.07	NA	1.5	NA
Eureka County Landfill	80	80	NA	80	80	NA	80	NA	80	NA
Oil and Gas Development										
Oil Gas and Geothermal Development	NA	NA	NA	NA	NA	640	NA	NA	NA	NA
Roads Future Reasonably Foreseeable Future Actions										
Misc. Road ROW	NA	NA	NA	NA	NA	169	NA	NA	NA	NA
Recreation and Conservation Reasonably Foreseeable Future Actions										
Perdiz Sport Shooting Range	95	NA	NA	95	95	NA	95	NA	95	NA
Reasonably Foreseeable Future Actions Total Disturbance Acres	**9,595**	**9,779**	**716**	**9,500**	**1,602**	**23,112**	**10,902**	**9,195**	**12,769**	**8,753**
Past, Present, and Reasonably Foreseeable Future Actions Total Disturbance Acres	**77,014**	**28,320**	**5,605**	**81,024**	**25,536**	**352,059**	**172,096**	**95,467**	**106,977**	**23,888**

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Notices of Intent

There are numerous closed or expired Notice of Intents (NOIs) within the CESA boundaries. Most of these NOIs have likely been reclaimed, and their cumulative impacts on present conditions would be decreased in magnitude. Similar to past mining activities, there may some residual cumulative impacts resulting from these NOIs. As a result, NOI disturbance was included in **Table 4.23-2**.

4.24.2 Roads

The number of miles of major roads within each resource CESA is presented in **Table 4.24-1**. In addition to these roads there are numerous gravel and dirt roads throughout the CESA that were not cataloged. **Table 4.23-2** displays the acres of roads within each resource CESA.

Table 4.24-1 Major Roads Past Actions

Roads	CESA(s)	Approximate Miles within Each CESA
Interstate 80, Approximate 400-foot ROW	Air Quality, Soil, Vegetation, Water Resources	NA
	Cultural, Paleontology, and Visual Resources	NA
	Geology and Minerals	NA
	Hazardous Materials and Waste	289
	Land Use, Access, Recreation, and Transportation	NA
	Grazing Management	NA
	Pronghorn Antelope	76
	Mule Deer	NA
	General Wildlife, Migratory Birds, and Raptors	NA
	Greater Sage-Grouse	NA
	Wild Horses	NA
U.S. Highways, Approximate 100-foot ROW	Air Quality, Soil, Vegetation, Water Resources	50
	Cultural, Paleontology, and Visual Resources	48
	Geology and Minerals	NA
	Hazardous Materials and Waste	209
	Land Use, Access, Recreation, and Transportation	33
	Grazing Management	38
	Pronghorn Antelope	24
	Mule Deer	37
	General Wildlife, Migratory Birds, and Raptors	44
	Greater Sage-Grouse	48
	Wild Horses	2
State Routes, ROW width varies from approximate 20-foot to 70-foot	Air Quality, Soil, Vegetation, Water Resources	33
	Cultural, Paleontology, and Visual Resources	22
	Geology and Minerals	NA
	Hazardous Materials and Waste	87
	Land Use, Access, Recreation, and Transportation	55

Roads	CESA(s)	Approximate Miles within Each CESA
	Grazing Management	31
	Pronghorn Antelope	161
	Mule Deer	121
	General Wildlife, Migratory Birds, and Raptors	70
	Greater Sage-Grouse	109
	Wild Horses	16
Local/County Routes, Approximate 50-foot ROW	Air Quality, Soil, Vegetation, Water Resources	NA
	Cultural, Paleontology, and Visual Resources	NA
	Geology and Minerals	NA
	Hazardous Materials and Waste	NA
	Land Use, Access, Recreation, and Transportation	NA
	Grazing Management	NA
	Pronghorn Antelope	6
	Mule Deer	NA
	General Wildlife, Migratory Birds, and Raptors	NA
	Greater Sage-Grouse	NA
	Wild Horses	NA
Other Roads, Approximate 20-foot ROW	Air Quality, Soil, Vegetation, Water Resources	1,512
	Cultural, Paleontology, and Visual Resources	1,332
	Geology and Minerals	67
	Hazardous Materials and Waste	41
	Land Use, Access, Recreation, and Transportation	1,512
	Grazing Management	770
	Pronghorn Antelope	4,409
	Mule Deer	2,888
	General Wildlife, Migratory Birds, and Raptors	1,482
	Greater Sage-Grouse	2,355
	Wild Horses	313

NA = Designates that approximate miles within a CESA are not applicable because the subject road does not occur within the respective CESA.

4.24.3 Railroads

The total railroad acreage within each CESA boundary is presented in the past action disturbance in **Table 4.23-2**. The typical railroad ROW is assumed to be 200 feet wide.

4.24.4 Wildland Fires

Between 2000 and 2015, numerous wildland fires have occurred within the CESA boundaries. The total acres of past wildland fires for each CESA are presented on **Table 4.23-2**. Wildland fires prior to 2000 were not included because these data are not available.

4.25 Present Actions

4.25.1 Mineral Development and Exploration

Mining and Exploration Projects

There are numerous mining and exploration projects within each resource CESA. **Table 4.23-2** shows the combined acres of disturbance within each resource for present mining and exploration projects. Major mines are listed by disturbance acreage in **Table 4.23-2**. Listed below are some of the small-scale mines and exploration projects included in the Mining and Exploration category in **Table 4.23-2**:

- Patty Exploration Project;
- M-I LLC Mountain Springs Mining;
- Carico Lake Mine;
- Black Rock Canyon Mine and Mill;
- Turquoise Mining May Mine;
- Buffalo Valley Mine and Exploration;
- Haliburton Pleasant View Exploration;
- Toiyabe Exploration and Toiyabe JV Project;
- Robertson Project;
- Fourmile Canyon Exploration Project;
- Trenton Canyon Exploration;
- West Pine Valley Exploration;
- Fire Creek Exploration;
- Coven-Helen Project;
- Copper Basin Exploration Project; and
- CMZ Exploration.

Below is a brief description of the major mineral development and exploration projects that occur throughout the CESA boundaries.

<u>Mount Hope</u>

The Mount Hope Project is an authorized, but not yet implemented, molybdenite mine and processing complex that has an 80-year mine life in Eureka County. The project consists of: an open pit; WRDAs; milling facilities; a molybdenite concentrate roaster and packaging plant; a ferromolybdenum plant; two tailings storage facilities; an exploration program; low-grade ore stockpile; water supply development with associated wells, water delivery pipelines, access roads; and power to the Kobeh Valley Well Field Area; a 230 kV electric power supply line from the existing Machacek substation, with a substation and distribution system located in the Project Area; and ancillary facilities. The proposed 230 kV power supply line would join the existing Falcon to Gonder 345 kV power line ROW near the Town of Eureka and follow the utility corridor to the Project Area. The project would also require a realignment of a section of the existing Falcon to Gonder power line during the latter part of the mine life. Closure of the Mount Hope tailing storage

facility and PAG WRDAs would use evapotranspiration cells to manage the long-term discharge from these facilities (BLM; 2012a).

Tonkin Springs Mine and Exploration Operations

The Tonkin Springs Mine is located in the northern Simpson Park Mountains in Eureka County, Nevada, approximately 40 miles northwest of the town of Eureka. The project consists of a HLP, an event pond, a tailings impoundment and seepage collection tank, a mill and process plant area, ancillary facilities, several open pit and waste rock disposal facilities, and exploration activities. All mining and processing activities were suspended in 1990 (BLM, 2014c). The Tonkin Springs Mine is now in final closure, which includes: decommissioning and clean-closure of the existing Tonkin Springs tailings impoundment and construction of a new evaporation pond for post-closure fluid management. The closure would require the construction of new seepage/draindown conveyance pipelines and decommissioning and removal of existing interim water management systems (BLM, 2014c). All exploration operations are currently in the process of being reclaimed (Vega, 2016).

Ruby Hill Mine

The Ruby Hill Mine is an existing mining operation located less than a mile northwest of the Town of Eureka, Nevada. Operations include one open pit, two waste rock disposal areas, a two-stage crushing facility, a solution processing facility, heap leach facilities, an arsenic treatment facility, and ancillary facilities, that include a warehouse/shop and an authorized Class III landfill. Operations also have the potential to use a tertiary crusher, a ball mill, and belt filters (BLM, 2012a).

Pan Mine

The Pan Mine is an existing mining operation located in the Pancake Mountain Range in White Pine County, about 50 miles west of Ely or 22 miles southeast of Eureka. The operation consists of a heap leach gold mine consisting of two primary open pits, three satellite pits, one HLP, three rock disposal areas, an access road, and a transmission line.

Marigold Mine

The Marigold Mine is located approximately three miles south of Valmy in the southern portion of Humboldt County, Nevada. Marigold Mine has been authorized for gold mining operations since 1988 (BLM, 2013b). Since that time several amendments leading to the current authorized operations were analyzed in multiple NEPA documents. The authorized mining operations consist of multiple open pits, heap leach facilities, waste rock storage areas, and precious metal recovery facilities.

Trenton Canyon

The Trenton Canyon mine is located approximately 34 miles east of Winnemucca and 18 miles west of Battle Mountain. The Trenton Canyon project is owned by Newmont USA, LTD. The Trenton Canyon has been in operation for many years, and consists of open pits, a heap leach facility, haul roads, exploration activities, overburden disposal areas, and ancillary facilities. The Trenton Canyon mine consists of three areas: The Valmy Pit area, the North Peak Pit area, and

the Trenton Canyon Pit area. Trenton Canyon Mine is currently in various stages of reclamation (BLM, 1998b).

Cortez Mine

The Cortez mine, operated by Barrick Cortez Incorporated, is located on the western flank of Mount Tenabo in the Cortez Mountains on the southeast side of Crescent Valley. The mine plan boundary consists of Gold Acres, Pipeline, Cortez, and Cortez Hills complexes. Cortez mine is on both private and public land administered by the BLM. Authorized disturbance includes open pits, waste rock facilities, heap leach facilities, tailings facilities, process buildings, administration buildings and ancillary structures, roads, growth media stockpiles, exploration, and underground mining activities. In addition, Barrick Cortez Incorporated has several authorized exploration operations associated with the Cortez Mine, including Horse Canyon/Cortez Unified Exploration Project II. The Horse Canyon/Cortez Unified Exploration Project is located approximately 70 miles southwest of Elko, Nevada. The current exploration activities include: overland access, new road construction; geophysical analysis; trenching; test wells; monitoring wells; communication sites; construction of drill pads and sumps; and reclamation (BLM, 2015i). Barrick Cortez Incorporated has submitted a mine plan amendment to the BLM for the Deep South Expansion Project. This mine plan amendment is discussed under Reasonably Foreseeable Future Actions.

Greystone Mine

The Greystone Mine is located approximately 28 air miles south-southeast of Battle Mountain (BLM, 2014d). The current mine operator is M-I SWACO. Barite mining has occurred at the Greystone Mine since approximately 1953 (BLM, 2014d). The mine occupies public land administered by the BLM and private land. The current mining operations include: exploration to further define the ore deposit; excavation to remove overburden and mine the ore; and mechanical separation using water and gravity to concentrate the ore (BLM, 2014d).

McCoy/Cove Mine and Exploration

The McCoy/Cove Mine is located approximately 30 miles southwest of Battle Mountain and is owned by Premier Gold Mines Limited. The project is located on public lands administered by the BLM with the exception of nine patented claims (NDEP, 2015c). The McCoy/Cove Mine is currently in closure status and in active reclamation (NDEP, 2015c).

Mule Canyon Mine

The Mule Canyon mine is owned by Newmont and is located approximately 15 miles southeast of Battle Mountain (BLM, 1996b). The gold mining operations included: five open pits; 14 overburden and interburden disposal areas; gold milling, processing, and tailings disposal facilities; and support and ancillary roads and facilities (BLM, 1996b). Mule Canyon Mine is currently in active reclamation.

Argenta Mine and Mill and Exploration Project

The Argenta Mine is an existing barite mining operation located approximately 15 miles east of Battle Mountain. The mine is operated by Baker Hughes Drilling Fluids and is located on private lands and public lands administered by the BLM. The current mining operation includes: open

pits; WRDs; a maintenance shop; ancillary and support facilities; the main access road; exploration areas; processing facilities; storage and equipment areas; an administration building; a warehouse; and the TSF (BLM, 2010c). The Argenta Mine was authorized by the BLM to expand the mining operations by 10 years of active mining and processing, two years of reclamation, and five years of monitoring in 2010 (BLM, 2010c).

Phoenix Mine

The Phoenix Mine is a gold and copper mining and beneficiation operation. Mill-grade oxide gold ore is beneficiated to gold concentrate at the Phoenix Mill facility, which also produces small amounts of copper and silver concentrates. Mill tailings are deposited in a TSF. Copper-containing ore is beneficiated using heap leaching followed by solvent extraction and electrowinning of copper from the leach solution.

Buckhorn Mine

The Buckhorn Mine is located approximately 47 miles north of U.S. Highway 50 and controlled by Buckhorn Mines Co. Approximately 465 acres of disturbance is associated with the mine (BLM, 2016c).

4.25.2 Utilities Infrastructure and Public Purpose

The acres of disturbance for utilities infrastructure and public purpose are presented in **Table 4.23-2**. While the disturbance has occurred in the past, all utilities and public purpose sites are currently operating and are resulting in present impacts.

Sierra Pacific Power Company Falcon to Gonder Power Line

The Sierra Pacific Power Company Falcon to Gonder Transmission Project involved the construction of a 345 kV power line, generally located between Ely and Dunphy, Nevada. The power line was constructed in 2003. It is approximately 180 miles long, has a construction disturbance width of 160 feet, and consists of H-frame towers (BLM, 2001a). The acres of disturbance within each CESA boundary are detailed in **Table 4.23-2**.

Mount Hope 230 kV Transmission Line (Permanent and Temporary ROWs)

The Mount Hope Mine 230 kV transmission line project includes the construction of a 24-mile, 230 kV electric power supply line from the existing Machacek substation, with a substation and distribution system located in the Mount Hope Mine Project Area. The power line would join the existing Falcon to Gonder 345 kV line ROW near the town of Eureka and follow the existing utility corridor to the Mount Hope Project area (BLM, 2012a). Disturbance associated with the Mount Hope transmission line is detailed in **Table 4.23-2**.

Atlas 25 kV Overhead Distribution Line

The Atlas 25 kV Overhead Distribution Line is approximately 5,982 feet long and is operated by Mt. Wheeler Power Inc. (BLM, 2016c). The disturbance associated with the Atlas 25 kV Overhead Distribution Line is detailed on **Table 4.23-2**.

Other Power Lines, Power Facilities, Telephone, and Fiber Optic Lines

There are several ROWs for power lines, power facilities, telephone, and fiber optic lines within the CESA boundaries (BLM, 2016c). Due to the high number of these facilities within the CESAs, the disturbance associated with these facilities was not broken up by specific power line, power facility, telephone line, or fiber optic lines, unless it was a major project (i.e., Falcon to Gonder). Power lines, power facilities, telephone, and fiber optic lines were grouped and analyzed in **Table 4.23-2** as "Other Power Lines and Power Facilities" and "Telephone and Fiber Optic Lines." The total estimated acreage of present disturbance associated with other power lines, power facilities, telephone, and fiber optic lines are presented in **Table 4.23-2**.

Communication Sites

There are numerous communication facilities within the CESA boundaries. The communication facilities have not been broken up by site due to the large number. Communication sites were grouped and analyzed as "Communication Sites" in **Table 4.23-2**. The total estimate acreage of present disturbance associated with communication sites are presented in **Table 4.23-2**.

4.25.3 Water Pipelines and Water Infrastructure

There are multiple water pipelines and water infrastructures sites within the CESA boundaries. Due to the large number, the water pipelines and water infrastructure have not been broken out by site. The total estimated disturbance acres are presented in **Table 4.23-2**.

4.25.4 Public Purpose

The total estimated acreage within the CESAs for present disturbance associated with public purpose sites are presented in **Table 4.23-2**. These include the Eureka County Sewage Treatment Facility, The Eureka County Volunteer Fire Station, and the Crescent Valley Airport. There are additional public purpose sites within the urban developed areas within the CESAs. Other public purpose sites within urban developed areas are included in the "Urban Development Present Actions" section of **Table 4.23-2**.

4.25.5 Oil, Gas, and Geothermal

The total estimated acreage for present disturbance of oil, gas and geothermal development are presented in **Table 4.23-2**, which includes a Southwest Gas natural gas pipeline from Elko to Winnemucca, McGinness Hill Geothermal Power Plant, and the Jersey Valley Power Plant.

4.25.6 Urban Development

Urban development includes areas within the CESAs are where people reside, or where some level of commercial businesses operate. Urban development centers within the CESAs include: The Town of Eureka, Austin, Beowawe, Diamond Valley, and Battle Mountain.

4.25.7 Recreation

Recreation activities within the CESAs include dispersed recreation as described in Section 4.14 of this EIS. In addition, the below developed recreation sites are within the CESAs.

Mill Creek Recreation Site

The Mill Creek Recreation Site is a campground located approximately 24 miles south of Battle Mountain on State Route 305. The campground offers 11 tent camp sites, three recreational vehicle sites, one dual accessible vault-type toilet, day use area, tables, and grills (BLM, 2016b). Camping is free of charge and is open all year.

Copper Basin Mountain Bike Trail

The Copper Basin Mountain Bike Trail is located west of State Highway 305 approximately 2.75 miles south of Battle Mountain, Nevada. The trail system offers a variety of mountain bike single and double track trails that wind through historic mining areas (Travel Nevada, 2016a). The disturbance associated with the Copper Basin Mountain Bike Trail is detailed in **Table 4.23-2**.

Shoshone Mountain Range OHV Trail System

The Shoshone Mountain Range OHV Trail System is located approximately 24 miles south of Battle Mountain, Nevada. The trail system is open to vehicles less than 50 inches in width and provides a remote landscape with views of the surrounding mountains (Battle Mountain Chamber of Commerce, 2016). The disturbance associated with the Shoshone Mountain Range OHV Trail System is detailed in **Table 4.23-2**.

Hickison Petroglyph Recreation Area

The Hickison Petroglyph Recreation Area is located approximately 24 miles east of Austin, Nevada. The Hickison Petroglyph Recreation Area features multiple petroglyph panels, which are evidence of prehistoric hunting and dwelling sites dating back to 10,000 B.C. (Travel Nevada, 2016b). The recreation area also includes campsites, a scenic interpretive trail, and picnic facilities (Travel Nevada, 2016b). The disturbance associated with the Hickison Petroglyph Recreation Area is detailed in **Table 4.23-2**.

4.26 Reasonably Foreseeable Future Actions

4.26.1 Mineral Development and Exploration

Mining and Exploration Projects

There are multiple pending mining and exploration projects within each resource CESA. **Table 4.23-2** presents the approximate acres of disturbance by CESA boundary. For this section, only large-scale mining and exploration projects are discussed. Below is a list of the proposed small-scale mining and exploration projects within the CESAs:

- Norse Windfall Exploration Project;
- Gold Canyon;
- Little Guy Claims Project;
- Windfall Project;
- Prospect Mountain Drilling Project;
- Atlas Gold Bar Exploration Drilling Project;
- Antler Peak Exploration;

- Mud Springs Drilling Project;
- Pleasant View Mine;
- Independence Mine;
- Fire Creek Mine;
- Gold Canyon Mine;
- Monarch Mill Site;
- Slaven Canyon Mine;
- Westside Exploration Project;
- Mill Creek Exploration Project;
- Shasta Project; and
- Gunman Project.

Marigold Mine

Marigold Mine is located approximately three miles south of Valmy in the southern portion of Humboldt County, Nevada. MMC submitted a mine plan amendment to the BLM in 2015. MMC is proposing a modification to the existing authorized mining operations which includes pits, waste rock storage areas, processing, roads, growth media stockpiles, water diversion structures, infill areas, and exploration. MMC is currently authorized for approximately 5,720 acres of disturbance on public and private land (Federal Register, 2016). The proposed mine plan amendment would include 1,893 acres of new disturbance on public and private land (Federal Register, 2016). The proposed disturbance acres within each CESA resource for the Marigold Mine are presented in **Table 4.23-2**.

Mount Hope

The Mount Hope Project is an authorized molybdenite mine that has an 80-year mine life. It is located approximately 23 miles northwest of Eureka, and is operated by Eureka Moly LLC. Eureka Moly LLC is currently authorized for 8,306 acres of disturbance on private and public land (BLM, 2016c). The proposed disturbance acres within each CESA boundary for the Mount Hope Project are shown in **Table 4.23-2**.

Phoenix Mine

As stated above, the Phoenix Mine is a gold and copper mining and beneficiation operation. Newmont has submitted an amendment to their Plan of Operations to increase disturbance by 3,507 acres. Under the proposed Project, the life of the Phoenix Mine would be extended from approximately 2040 to 2063. The proposed boundary would encompass approximately 18,520 acres, including 9,807 acres of public land managed by the BLM. Total mine-related surface disturbance under the Project would increase from 8,374 acres to 11,889 acres, which includes 5,901 acres on public land and 5,988 acres on private land.

Cortez Mine

The Cortez Mine, operated by Barrick Cortez Inc., is located on the western flank of Mount Tenabo in the Cortez Mountains on the southeast side of Crescent Valley. Barrick Cortez Inc. submitted a mine plan amendment in 2016 for the Deep South Expansion Project. The Cortez Mine is currently authorized for approximately 16,045 acres of disturbance (BLM, 2016c). The mine plan

amendment is proposing an additional 3,672 acres of disturbance (Barrick Cortez, 2016). **Table 4.23-2** shows the proposed disturbance acres within each CESA resource boundary for the Cortez Mine.

Trenton Canyon Mine

The Trenton Canyon Mine is located approximately 13 miles west of Battle Mountain. The Trenton Canyon Mine is currently permitted for 1,633 acres of disturbance, with approximately 969 acres that have been disturbed (BLM, 2016c). Based on the allowed disturbance for Trenton Canyon Mine, 664 remaining acres may be disturbed within the project area.

Scruffy Oz Mine and Exploration Project

The proposed Scruffy Oz Mine and Exploration Project is operated by Baker Hughes Drilling Fluids and is located approximately 13 miles southeast of Battle Mountain. The proposed application for the Scruffy Oz Mine and Exploration Project is currently pending for 2,180 acres of surface disturbance on the project site (BLM, 2016c).

Toiyabe JV Mine Project

The Toiyabe JV Mine Project is located approximately 42 miles south of Battle Mountain and is controlled by Barrick Cortez Inc. The Toiyabe JV Mine Project has a permitted disturbance area of 802 acres, with approximately 167 acres that have been disturbed (BLM, 2016c). There are approximately 635 remaining acres within the Toiyabe JV Mine Project that may be disturbed based on the authorized disturbance.

Gibellini Project

The Gibellini Mine is a proposed open pit, heap leach, vanadium mining operation proposed by American Vanadium US, Inc. The Project also includes a water and communications corridor extending 6.5 miles from the Fish Creek Ranch to the Project area, and a power corridor generally paralleling the Fish Creek Road to Highway 50. The proposed Gibellini Mine Project would be located approximately 27 miles south of Eureka in Eureka and White Pine counties. The project area contains approximately 7,697 acres of public land managed by the Mount Lewis Field Office; of that area, approximately 730 acres of disturbance is proposed.

Pan Mine

The Pan Mine is described under present mining operations. According to LR2000, approximately 1,007 acres have been disturbed, allowing for an additional 2,231 acres of disturbance associated with Reasonably Foreseeable Future Actions.

Notices of Intent

There are several pending NOIs within the CESA boundaries (BLM, 2016c). **Table 4.23-2** displays the approximate acres within each CESA boundary for pending NOIs.

Sand and Gravel Operations, Material Sites, and Community Sand and Gravel Pits

There are multiple pending sand and gravel operations, material sites, and community sand and gravel pits within the CESAs (BLM, 2016c). Approximate disturbance for sand and gravel operations, material sites, and community sand and gravel pits are provided in **Table 4.23-2**.

4.26.2 Utilities, Infrastructure, and Public Purpose

Telephone and Fiber Optic Lines and Communication Sites

There are pending applications for telephone and fiber optic lines and communication sites within the CESA boundaries. The proposed total disturbance for telephone and fiber optic lines and communication sites are detailed in **Table 4.23-2**.

Power Lines

There are pending applications for power lines and associated facilities (BLM, 2016c) within the CESA boundaries. The proposed total disturbance for power line facilities within the CESAs are provided in **Table 4.23-2**.

Water Pipelines

Pending disturbance associated with water pipeline applications within the CESA boundaries are provided in **Table 4.23-2**.

4.26.3 Oil, Gas, and Geothermal

The total estimated acreage for RFFA disturbance for oil, gas and geothermal development are presented in **Table 4.23-2**, which includes an application for Beowawe Power LLC, for approximately 638 acres (BLM, 2016c).

4.26.4 Roads

There are several pending applications for road ROWs within the overall CESA boundaries (BLM, 2016c). The total proposed disturbance associated with each CESA for proposed road ROWs is detailed in **Table 4.23-2**.

4.26.5 Restoration Projects

3 Bars Ecosystem and Landscape Restoration Project

The 3 Bars Ecosystem and Landscape Restoration Project (3 Bars) is approximately 749,810 acres in central Eureka County, northwest of Eureka, Nevada. The ecosystem is administered by the BLM MLFO. It is a shrub-steppe ecosystem with important habitat for greater sage-grouse, mule deer, Lahontan cutthroat trout, and numerous other fish and wildlife species, including migratory birds and wild horses. The 3 Bars ecosystem is also an important recreation resource for Nevada residents and visitors. Resource conditions on several areas within the ecosystem, however, have deteriorated due to past land use activities, causing the BLM to target this area for restoration (BLM, 2016f). The BLM has identified site-specific treatment projects that would focus on four priority vegetation concerns including riparian, quaking aspen (aspen), singleleaf pinyon pine and Utah juniper (pinyon-juniper), and sagebrush. MMI may complete some of these

restoration projects from the 3 Bar ecosystem as part of the proponent-driven mitigation for the Project.

Roadside Fuel Break Hazardous Fuels Reduction Project

The Roadside Fuel Break Hazardous Fuels Reduction Project is located in central Nevada, within Lander, Eureka, Nye, and Esmeralda Counties. The future project proposes to establish and maintain fuel breaks on approximately 30,000 acres of public lands within the Shoshone-Eureka and Tonopah Planning Areas in Lander, Eureka, Nye, and Esmeralda Counties, Nevada (BLM, 2016g). Various fuels treatment methods would be implemented in a phased manner over multiple years with approximately 500 to 3,000 acres implemented annually. The proposed project would reduce fuels, protect wildlife, and increase suppression effectiveness (BLM, 2016g).

4.27 Air Quality

4.27.1 CESA Boundary

The CESA for air quality includes the Kobeh Valley Hydrographic Basin (#139) and the Diamond Valley Hydrographic Basin (#153), and extends six miles (10 kilometers) north of the Kobeh Valley Hydrographic Basin (**Figure 4.23-1**). The total area of the CESA encompasses approximately 1,120,249 acres. The air quality CESA was based on the anticipated extent of cumulative impacts to air quality.

4.27.2 Past and Present Disturbances

Existing air quality within the CESA is currently in attainment or unclassifiable for all criteria pollutants due to lack of monitoring data. There are no areas within the CESA that are classified as a known Prevention of Significant Deterioration triggered area. Historic development in the CESA has included mining and mineral exploration activity, utility and infrastructure construction, road construction, wildland fires, and limited urban development (**Table 4.23-2**). Since the impacts from the past and present disturbances on air quality are not directly related to the acreage disturbed, impacts to this resource are discussed in terms of potential emissions. Those projects have accounted for short-term to medium-term surface disturbance and gaseous emissions. Smoke generated during wildland fires has additional, intermittent impacts on local air quality.

Current major minerals operations within the CESA include Mount Hope (not currently operating), the Tonkin Springs Mine (currently in reclamation), and the Ruby Hill Mine. There are also several smaller mining or exploration projects, and past and present sand and gravel operations within the CESA. The only urban development within the CESA is the Town of Eureka and Diamond Valley (including the surrounding agricultural lands). Livestock grazing and dispersed recreation also occurs throughout the CESA.

4.27.3 Reasonably Foreseeable Future Disturbances

RFFAs in the CESA would be similar to those that are presently occurring and would include: mineral exploration and development, utility lines and infrastructure (**Table 4.23-2**). Livestock grazing and dispersed recreation are expected to continue indefinitely into the future. Wildland

fires in this CESA would also be expected to occur in the future. In addition, future restoration projects could occur in this CESA. There are approximately 187,874 acres of the proposed 3 Bars treatment areas within the air quality CESA, which may increase dust and combustion exhaust. However, the treatments would not result in emission that exceed PSD thresholds, or NAAQS. RFFAs are expected to have similar impacts to air quality as described for past and present actions above.

4.27.4 Cumulative Disturbances

Cumulative effects to air quality in the CESA from past, present, and RFFAs in combination with the Proposed Action would include emission sources and fugitive dust released by mining, infrastructure construction, vehicle travel on unpaved roads, and potential smoke from wildland fires. Mine development and exploration operations may also affect air quality through emissions from mobile mining equipment, vehicles, and process equipment. The air quality impacts from ground disturbance are typically localized and minor for all but the largest areas of disturbance. Grazing can produce fugitive dust, but the quantities are minimal and are expected to remain approximately equal to present conditions. Travel on unpaved roads in the CESA can affect air quality from vehicle emissions and fugitive dust. This type of use has not affected air quality measurably in the past. Urban development includes vehicle use in a concentrated area, which increases gaseous emissions. Past, present, and RFFAs in combination with the Proposed Action would also include GHG emissions.

4.27.5 Cumulative Effects

Cumulative effects to air quality associated with the past, present, and RFFAs and the Proposed Action would include emission sources and increased fugitive dust. Existing and proposed mining operations and emissions from motor vehicle traffic are the major sources of criteria pollutants within the CESA. The Proposed Action would result in an increase in emissions of criteria pollutants (i.e., PM_{10}, SO_2, NO_X, CO); however, impacts would only last during mining operations (estimated at seven years which includes two years of residual heap leaching), and would be within Nevada and NAAQS standards. The Proposed Action would also include a cumulative increase in GHG emissions.

In combination with past, present, and RFFAs, cumulative impacts to region-wide air quality are expected to remain minor. However, isolated pockets of moderate impacts are possible near vehicle access routes, active mining and exploration projects, or expansions of existing mining or exploration projects. Once project operations cease, impacts to air quality are expected to return to background levels.

A separate air quality modeling analysis was conducted to determine the cumulative impacts of the combined emissions from the Proposed Action, the Mount Hope Project, and the Ruby Hill Project. The results of this analysis demonstrate compliance with the applicable NAAQS (Air Sciences, 2017b). The cumulative impacts from all three mines, plus background, provided in this memorandum are:

- 8-hour and 1-hour CO – 2,015 and 4,302 $\mu g/m^3$, respectively
- Annual and 1-hour NO_2 – 15 and 150 $\mu g/m^3$, respectively
- Annual and 24-hour $PM_{2.5}$ – 9.4 and 31 $\mu g/m^3$, respectively
- 24-hour PM_{10} – 97 $\mu g/m^3$
- 3-hour and 1-hour SO_2 – 47 and 27 $\mu g/m^3$, respectively

As shown above, the cumulative impact air impacts form all three mines with the inclusion of background concentrations are below NAAQS for each pollutant and averaging time. With the exception of annual $PM_{2.5}$ and 1-hour SO_2, the change in the air impacts from the addition of the emissions from the two nearby mines are at or below the SIL, indicating that the impact contribution from the two nearby mines would result in no substantial adverse impact. Although the annual $PM_{2.5}$ and 1-hour SO_2 air impacts would increase by more than the SIL, the cumulative air impacts continue to demonstrate compliance with the NAAQS (Air Sciences, 2017b).

Total GHG emissions from the Proposed Action would be an estimated 155,000 metric tpy which represents 0.0004 percent of the estimated global annual GHG emissions. GHG emissions from past, present, and RFFAs are expected to be minor, but would be a cumulative addition of GHGs which have been linked with accelerated global climate change (IPCC, 2007a). In combination with past, present, and RFFAs the cumulative GHG emissions contribution is expected result in no substantial adverse impact.

4.28 Cultural Resources

4.28.1 CESA Boundary

The CESA for cultural resources includes the viewshed of the Project as represented by the Project's KOPs (**Figure 4.23-2**). The rationale for selecting this as the CESA was based on the results of the visual analysis of facilities within the Project area that would be visible from the KOPs, and the area where past, present, and RFFAs may have cumulative impacts to cultural resources. This CESA includes the area of potential cumulative impacts to cultural resources. The total area of the CESA encompasses approximately 1,284,958 acres of both public and private land.

4.28.2 Past and Present Disturbances

Past and present disturbance within the cultural resources CESA includes the following: mineral exploration and development (3,490 acres); sand and gravel operations (1,591 acres), utilities, infrastructure, and public purpose activities (4,123 acres); roads (3,975 acres); livestock grazing and agricultural cropping; limited urban development (3,740 acres); designated recreation areas (400 acres); dispersed recreations; and wildland fires (1,222 acres).

Development on state and federal lands requires that cultural resource surveys be conducted to determine the presence of cultural resource sites eligible for listing on the National Register; however, there is no such requirement for disturbance on private lands unless there is a federal or state nexus. As directed by Section 106 of the NHPA, National Register-eligible sites are

generally avoided or mitigated if avoidance is not possible for projects with a federal or state nexus. Projects/development disturbances conducted prior to 1966 (i.e., prior to NHPA) and/or those without a federal or state nexus generally did not identify/quantify cultural resource sites or impacts to them.

The past and present actions in the CESA may have resulted, or may result, in the loss, disturbance, theft, and burial of cultural artifacts and sites, as well as the modification and alteration of the setting of cultural sites and resources. The incremental degradation of cultural resources reduces the information and interpretive potential of historic properties.

4.28.3 Reasonably Foreseeable Future Disturbances

RFFAs within the cultural resources CESA would include the following: mineral exploration and development (9,434 acres); sand and gravel operations (265 acres); and a public purpose site [Eureka County Landfill] (80 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. In addition, future restoration projects could occur in this CESA. There are approximately 123,653 acres of proposed 3 Bars treatment areas in the cultural resources CESA. These activities would lead to similar impacts as stated for past and present actions.

4.28.4 Cumulative Disturbances

Of the 1,284,958 acres covered by the cultural resources CESA, approximately 28,320 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately two percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 29,449 acres, which is approximately two percent of the CESA.

4.28.5 Cumulative Effects

As directed by law, cultural resources inventories are conducted for any actions involving federal lands, and adverse effects to historic properties avoided or mitigated as appropriate. Avoidance through project redesign is the preferred method of mitigation; however, when avoidance is not feasible, data recovery or other forms of mitigation are implemented prior to ground-disturbing activities. Under the Proposed Action, if the BLM determines that a property would be adversely affected, then avoidance would be recommended. If avoidance is not feasible, measures to minimize or mitigate effects would be proposed in accordance with a MOA and detailed in a HPTP developed in coordination with the SHPO. Any previously unknown NRHP-eligible sites discovered during construction activities would be treated in accordance with the MOA and HPTP, as well as the applicant-committed EPMs. With implementation of the stipulations outlined in the MOA, HPTP, and implementation of the applicant-committed EPMs, impacts to historic properties are anticipated to be minor to negligible. Cumulative actions and disturbances within the CESA may have resulted in impacts to cultural resources including displacement of soil containing cultural materials, disturbing historic features, displacing cultural material from its original context, and visual or auditory impacts to cultural site's setting. In addition, illegal collecting or destruction of artifacts may have occurred throughout the CESA. However, as stated above, projects occurring on federal land, or those having a state or federal nexus would need to avoid cultural

resources, or provide for appropriate mitigation. Past, present, and RFFAs, when combined with the Proposed Action, would amount to approximately two percent of the CESA which is a relatively small amount of disturbance compared to the entire CESA area. The measures outlined in the MOA, HPTP, and the EPMs would minimize contributions to cumulative effects. Cumulative impacts to cultural resources from past, present, and RFFAs when combined with the Proposed Action would result in an adverse effect; however, with the implementation of the MOA there would be no adverse effects. It should be noted that the development and implementation of treatment plans for historic properties that cannot be avoided or protected typically involves archaeological excavation or other forms of data recovery. Although data recovery mitigates adverse effects to historic properties under Section 106, the property itself ultimately is lost, preventing future opportunities for scientific research, preservation, or public appreciation. Over time, this represents a cumulative loss.

4.29 Environmental Justice

4.29.1 CESA Boundary

The CESA for environmental justice is Eureka County (**Figure 4.23-3**). This CESA was selected because this is the area most likely to result in cumulative impacts to an environmental justice population. The total area of the CESA encompasses approximately 2,673,325 acres of both public and private land.

4.29.2 Past and Present Disturbances

Past and present disturbance within the environmental justice CESA includes mining and mineral exploration activity, utility and infrastructure construction, road construction, agriculture operations, livestock grazing, dispersed recreation, and areas of urban development within Eureka County, including the Town of Eureka, Beowawe, and Diamond Valley. Major mining activities within the CESA boundary include the Ruby Hill Project, the Mount Hope Project, the Tonkin Springs Project (currently in permanent closure), Buckhorn Project (currently in post-closure monitoring), portions of the Cortez Mine operations, Barrick's Gold Strike Mine, and Newmont's Gold Quarry Mine. Past and present actions within the CESA may have resulted in impacts to environmental justice populations. However, any project that occurs on public land, where NEPA compliance is required, would need to analyze and mitigate impacts to environmental justice populations. Development on private land, unless there is a state or federal nexus, is not required to analyze or mitigate impacts to environmental justice populations.

4.29.3 Reasonably Foreseeable Future Disturbances

RFFAs in the CESA would be similar to those that are presently occurring and would include: mineral exploration and development, utility lines and infrastructure, livestock grazing, dispersed recreation, and restoration projects. Development inside the urban centers within the CESAs are likely to expand in the future as well.

4.29.4 Cumulative Disturbances

Analysis of environmental justice is not based on overall acres of disturbance, but more on the incremental impacts those projects would have on environmental justice populations.

4.29.5 Cumulative Effects

No environmental justice populations are located within the Project area. The Proposed Action would have no disproportionate effect on an environmental justice population. As a result, the Proposed Action when combined with past, present, and RFFAs would have negligible cumulative impacts to an environmental justice population.

4.30 Forests Products

4.30.1 CESA Boundary

The CESA for forest products includes the Kobeh Valley Hydrographic Basin (#139) and the Diamond Valley Hydrographic Basin (#153), and extends six miles (10 kilometers) north of the Kobeh Valley Hydrographic Basin (**Figure 4.23-1**). The total area of the CESA encompasses approximately 1,120,249 acres. This CESA was selected because it is the anticipated extent of cumulative impacts to forest products.

4.30.2 Past and Present Disturbances

Past and present disturbance within the forest products CESA includes the following: mineral exploration and development (4,181 acres); sand and gravel operations (3,400 acres), utilities, infrastructure, and public purpose activities (4,779 acres); roads (4,438 acres); livestock grazing and agricultural cropping; limited urban development (36,856 acres); dispersed recreation; and wildland fires (13,765 acres).

The past and present actions in the CESA may have resulted in the removal of woodland communities and forest products, affecting activities such as pine nut harvesting, fuel wood cutting, and Christmas tree cutting. Removal of these woodland species from past and present actions is a long-term loss of forest products due to the long period that it takes for these species to reestablish (i.e., 50 to 100 years or more).

4.30.3 Reasonably Foreseeable Future Disturbances

RFFAs within the forest products CESA would include the following: mineral exploration and development (8,796 acres); sand and gravel operations (614 acres); utilities, infrastructure, and public purpose activities (90 acres); and a recreation facility [Perdiz Sport Shooting Range] (95 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. In addition, future restoration projects could also occur in this CESA. There are approximately 187,874 acres, of proposed 3 Bars treatment areas in the forest products CESA, including pinyon-juniper treatments. These activities would lead to similar impacts as stated for past and present actions.

4.30.4 Cumulative Disturbances

Of the 1,120,249 acres covered by the forest products resources CESA, approximately 77,014 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 78,143 acres, which is approximately seven percent of the CESA.

4.30.5 Cumulative Effects

Cumulative effects to forest products in the CESA from past, present, and RFFAs in combination with the Proposed Action would include removal of woodland communities that may be used for various forest products and recreational use. Removal of these species is a long-term, cumulative impact since these species can take approximately 50 to 100 or more years to reestablish in reclaimed areas. The Proposed Action would result in long-term, cumulative impacts by removing additional woodland species (approximately 647 acres of curl-leaf mountain mahogany and pinyon/juniper woodlands), which would result in a cumulative loss of area to conduct pine nut harvesting, fuel wood cutting, and Christmas Tree cutting for approximately 50 to 100 years. The Proposed Action would also not reclaim approximately 153 acres of disturbance within a woodland species community, which would be a cumulative, permanent loss of forest products. However, the past, present, and RFFA disturbance acreage specified above, is unlikely to be entirely within woodland communities, so overall cumulative impact is greatly exaggerated when looking at cumulative acreage disturbance. In addition, there are other undisturbed areas within the CESA that may be used to harvest forest products. The Proposed Action, when combined with past, present, and RFFAs would result in a minor cumulative impact to forest products.

4.31 Geology and Minerals

4.31.1 CESA Boundary

The CESA for geology and minerals is the Antelope Mining District. The CESA encompasses approximately 82,865 acres (**Figure 4.23-3**). The CESA boundary was chosen because it includes the area of potential cumulative impacts to geological and mineral resources.

4.31.2 Past and Present Disturbances

Within the geology and minerals CESA, past and present disturbance as detailed in **Table 4.23-2** includes: mineral development and exploration activities (2,343 acres); sand and gravel operations (two acres); utilities, infrastructure, and public purpose activities (89 acres); roads (163 acres); agricultural cropping; and livestock grazing; and wildland fires (2,292).

Mining and exploration activities and sand and gravel operations in the CESA (2,345 acres) typically have the largest impacts on geology and mineral resources because they contribute to mineral resource depletion, removal of mineral resources from availability for development, topographic changes, and affect geotechnical stability. Other actions with potential effects on geology include: utility lines and roads. While these activities also disturb surface acreage, they

typically conform closely to the local topography and have negligible, if any, impacts on geology and mineral resources.

4.31.3 Reasonably Foreseeable Future Disturbances

RFFAs within the geology and minerals CESA would include the following: mineral exploration and development (716 acres); livestock grazing; and dispersed recreation (**Table 4.23-2**). Wildland fires in this CESA may occur in the future. Restoration projects in this CESA may also occur in the future. There are approximately 38,298 acres of proposed 3 Bars treatment areas that encompass the geology and minerals CESA, which may impact potential access to mining claims, or access to areas for mineral exploration and development. The mining activities would lead to similar impacts as stated for past and present actions, removal of mineral resources from mineral exploration and development.

4.31.4 Cumulative Disturbances

Of the 82,865 acres within the geology and minerals CESA, approximately 5,605 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 6,734 acres, which is approximately eight percent of the CESA.

4.31.5 Cumulative Effects

Gold-bearing ore has been, or would likely be removed from within the CESA from past, present, and future mining actions, which is estimated to occur over approximately 3,061 acres. In addition, access to claims and mineral exploration may be impacted by restoration project within the CESA. However, access restriction from restoration projects would be resolved prior to starting treatments. Gold-bearing ore would be removed from Project area reserves as part of the Proposed Action, which would result in a cumulative loss of mineral reserves. However, the Project proposes to extract approximately 2.6 million tons per year of ore (estimated at 13 Mt over the seven-year life-of-mine), which is a small amount of the overall regional and geologic resource that may be available within the 82,865 acre CESA. Considering past, present, and RFFA disturbances in the geology and mineral resources CESA combined with the Proposed Action, cumulative effects on geology and mineral resources would be a minor cumulative impact to the total potential gold reserves in the CESA.

4.32 Grazing Management

4.32.1 CESA Boundary

The CESA boundary for grazing management resources includes the Ruby Hill, Lucky C, Roberts Mountain, Willow Ranch, Three Bars, Santa Fe/Ferguson, and Shannon Station Allotments. (**Figure 4.23-6**). The total area of the CESA encompasses approximately 556,125 acres. The CESA boundary was chosen because it is the anticipated extent of cumulative impacts to grazing activities.

4.32.2 Past and Present Disturbances

Within the grazing management CESA, past and present disturbance as detailed in **Table 4.23-2** has resulted from the following activities: mineral development and exploration activities (2,643 acres); sand and gravel operations (2,676 acres); utilities, infrastructure, and public purpose activities (4,251 acres); roads (2,518 acres); limited urban development (5,079 acres); wildland fires (6,767 acres); agricultural cropping; dispersed recreation; and livestock grazing. There are also various range improvements within the CESA, including range fences.

Mineral exploration and development in the CESA directly remove land from grazing and range use and increases the likelihood of spreading non-native, invasive species, and noxious weeds during the duration of mining activities. These noxious weeds and non-native invasive species further reduce the amount of usable range and available forage in the long-term. This loss of grazing area may result in the loss of AUMs. As stated in Section 4.7, there is an economic cost from loss of AUMs. Grazing area and AUMs would be expected to return after reclamation of these activities, but the economic cost would result in an impact until reclamation occurs and a productive level of grazing returns. In addition, past and present actions may have resulted in removal or destruction of grazing improvements (e.g., cattle guards and range fencing).

The utilities, infrastructure, and public purpose activities within the CESA include ground disturbance and vegetation clearing, which impacts livestock grazing and forage area. However, construction of power lines and telephone lines does not typical result in a loss of access to grazing area. If the disturbances associated with power lines and telephone lines are not reclaimed, or if revegetation does not establish after reclamation, the spread of noxious weeds and non-native, invasive species would likely occur, reducing grazing area quality within the CESA. However, there has likely been a loss of access to grazing area as a result of the Eureka County Sewage Treatment Facility and the Eureka County Volunteer Fire Station, which totals a loss of approximately 85 acres of lost grazing area.

Disturbance associated roads within the CESA provide opportunity for the spread of noxious weeds and non-native invasive species and since road disturbance is often slower to reestablish native vegetation due to soil compaction, and weed species are generally the first to establish. In addition, off-highway vehicles often spread seeds of noxious weeds and non-native invasive species. The establishment and spread of weed species reduces the availability and quality of forage area for livestock grazing. Use of these roads may also have resulted in vehicle-related mortality to livestock. Dispersed recreation also has the potential to spread weed species.

Urban development occurs in the Project area from Diamond Valley and the Town of Eureka. The Town of Eureka is the County seat of Eureka County, and includes mixed lands uses, including residential and commercial developments. Diamond Valley is a sparsely populated area, which includes numerous agricultural operations. Urban development within the CESA has resulted in impacts to livestock grazing, as the area used for residential, commercial, and agricultural development is no longer open for livestock grazing. However, the urban development within the CESA is a very small portion of the available grazing area within the CESA.

4.32.3 Reasonably Foreseeable Future Disturbances

RFFAs within the rangeland resources CESA would include the following: mineral exploration and development (905 acres); sand and gravel operations (512 acres); utilities, infrastructure, public purpose actions (90 acres); and the proposed Perdiz Sport Shooting Range (95 acres) (**Table 4.23-2**). The Mount Hope Project is a potential RFFA. The Mount Hope Project would include perimeter fencing, which would result in additional livestock grazing restrictions within the CESA. The Mount Hope Project is anticipated to result in the permanent loss of 32 AUMs and the long-term loss of 781 AUMs. This includes 32 AUMs permanently lost in the Roberts Mountain allotment, and a long-term loss of 490 AUMs within the Roberts Mountain allotment. Livestock grazing and dispersed recreation are anticipated to continue within the CESA. Wildland fires in the CESA may occur in the future. In addition, future restoration projects could also occur in this CESA. There are approximately 154,397 acres of proposed 3 Bars treatment areas in the grazing management CESA, which may result in loss of forage and water availability and quality. Disturbance as a result of these proposed activities would be similar to those described from past and present actions.

4.32.4 Cumulative Disturbances

Of the 556,125 acres within the grazing management CESA, approximately 25,536 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately five percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 26,665 acres, which is approximately five percent of the CESA.

4.32.5 Cumulative Effects

Cumulative effects to grazing management resources in the CESA from past, present, and RFFAs in combination with the Proposed Action would include loss of or restricted access to grazing areas, loss of AUMs (including the economic cost that results from the loss of AUMs), reduction in forage suitability, the spread of noxious weeds and non-native invasive species, and the removal of or destruction of range improvements.

The Project would result in the permanent loss of 10 AUMs, and the long-term loss of 69 AUMs until reclamation is completed. This is less than one percent of the total active AUMs within the Project boundary, and would be a much smaller percentage of the total AUMs within the CESA boundary. In addition, successful reclamation may increase the forage quality and quantity within the Project area through reseeding with grasses, forbs, and shrubs on previously disturbed areas, or areas that were previously pinyon-juniper. Additionally, future restoration projects could affect livestock in the CESA by exposing them to treatments that could harm their health, interfere with their movements, cause changes in vegetation that could positively or negatively alter the carrying capacity of the allotments, or limit their access to water. Alternately, vegetation management activities could improve the amount and quality of forage, potentially increasing the carrying capacity of the allotments. (BLM, 2016f). Specific social impacts resulting from treatment project are discussed in Section 4.40. The cumulative impacts from the Proposed Action would result in minor cumulative impacts in relation to the total AUMs within the CESA. However, when considered in combination with past, present, and RFFAs, even though the cumulative loss of AUMs would be minor when considering all the AUMs within the CESA, the economic loss of

these AUMs may be a major impact to individual ranchers, particularly those in the Roberts Mountain allotment.

4.33 Hazardous or Solid Wastes

4.33.1 CESA Boundary

The CESA for hazardous materials is described in **Table 4.23-1**, and includes the Plan boundary and the potential transportation routes to the Plan boundary (**Figure 4.23-4**). This CESA boundary encompasses a combined total of approximately 640 miles of Interstate 80, U.S. Highway 50, State Route 278, and other access roads. Cumulative effects were analyzed by examining the potential transportation routes where hazardous materials may be shipped to and from the Project area. This CESA was chosen because the risk of a reportable quantity spill amount or fuel released to the environment is more likely during transportation than during storage or use, and this CESA is the anticipated extent of cumulative impacts from transportation of hazardous and solid wastes.

4.33.2 Past and Present Disturbances

Within the hazardous materials and waste CESA, past and present actions that have occurred which include the transport of hazardous or solid wastes include: mineral development and exploration activities; oil, gas, and geothermal development; utilities, infrastructure, and public purpose activities; and potential transportation of hazardous materials to commercial, industrial, or agricultural operations within areas of urban development within the CESA.

The transportation routes within the CESA have been used in the past, and are currently being used to transport hazardous materials, including reagents and petroleum, to nearby mining operations and other customers. Vehicles using these routes also contain petroleum fuels. Increased traffic on these routes would also increase the potential for vehicle collision with other vehicles transporting hazardous materials. There are numerous major mines throughout Nevada that utilize one or more of the transportation routes making up the CESA to transport hazardous materials. These major mines include, but are not limited to, the Ruby Hill Mine, Hycroft Mine, Marigold Mine, Lone Tree Complex, the Argenta Mine, Cortez Mine, and Phoenix Mine. Utilities such as power lines and telephone lines primarily would use petroleum-based products during construction and operation. Urban development, agriculture, and public purpose sites (e.g., waste water treatment facilities) within the CESA may require transportation of chemicals and hazardous material, including petroleum products. All existing projects would need to comply with all federal, state, and local regulations relevant to the transport, handling, and disposal of all wastes.

4.33.3 Reasonably Foreseeable Future Disturbances

RFFAs within the hazardous materials and waste CESA would include actions similar to those described under past and present actions, including: mineral development and exploration activities; oil, gas, and geothermal development; utilities, infrastructure, and public purpose activities; urban development, and restoration projects. These activities would lead to similar impacts as stated for past and present actions.

4.33.4 Cumulative Disturbances

Under the Proposed Action, it is reasonable to expect that the analyzed transportation routes would be used to transport hazardous materials at levels greater than current levels.

4.33.5 Cumulative Effects

All hazardous wastes generated during mining operations associated with the Proposed Action would comply with all federal, state, and local regulations relevant to the transport, handling, and disposal of wastes. All hazardous materials produced on site would be transported to a licensed facility. All non-hazardous solid wastes would be disposed of in the on-site Class III waivered landfill. The Proposed Action may result in potential spills of petroleum materials; however, the Proposed Action includes a SCP for management of petroleum materials. In the context of existing and reasonably foreseeable solid and hazardous waste generation, the Proposed Action would constitute a cumulative increase in hazardous waste generation and solid waste management, and a cumulative increase in transportation of hazardous waste on the transportation routes within the CESA, which may result in a cumulative increase in potential spills or accidents involving hazardous material. However, based upon the small quantities of hazardous waste that would be generated by the Proposed Action, an accident resulting in a release to the environment during transportation off the Proposed Action area is not anticipated. Considering past, present, and RFFA actions in the Hazardous or Solid Wastes CESA, combined with the Proposed Action, cumulative effects from hazardous or solid wastes generation or transportation would be minor.

4.34 Historic Trails

4.34.1 CESA Boundary

The CESA for historic trails includes the viewshed of the Project as represented by the Project's KOPs (**Figure 4.23-2**). The rationale for selecting this as the CESA was based on the results of the visual analysis of facilities within the Project area that would be visible from the KOPs. This CESA includes the area of potential cumulative impacts to historic trails. The only historic trail within the CESA is the Pony Express Trail. The total area of the CESA encompasses approximately 1,284,958 acres of both public and private land.

4.34.2 Past and Present Disturbances

Past and present disturbance within the historic trails CESA includes the following: mineral exploration and development (3,490 acres); sand and gravel operations (1,591 acres), utilities, infrastructure, and public purpose activities (4,123 acres); roads (3,975 acres); livestock grazing and agricultural cropping; limited urban development (3,740 acres); designated recreation areas (400 acres); dispersed recreations; and wildland fires (1,222 acres).

The past and present actions in the CESA may have resulted, or may result, in visual or auditory impacts to the setting of the Pony Express Trail.

4.34.3 Reasonably Foreseeable Future Disturbances

RFFAs within the historic trails CESA would include the following: mineral exploration and development (9,434 acres); sand and gravel operations (265 acres); and a public purpose site [Eureka County Landfill] (80 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. In addition, future restoration projects could also occur in this CESA. There are approximately 123,653 acres of proposed 3 Bars treatment areas in the historic trails CESA. These activities would lead to similar impacts as stated for past and present actions.

4.34.4 Cumulative Disturbances

Of the 1,284,958 acres covered by the cultural resources CESA, approximately 28,320 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately two percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 29,449 acres, which is approximately two percent of the CESA.

4.34.5 Cumulative Effects

Cumulative effects to historic trails in the CESA from past, present, and RFFAs in combination with the Proposed Action would include introduction of different forms, lines, colors, noise, and texture elements that contrast with features of the existing landscape through areas of vegetation clearance, soil disturbance, and facility construction. Many components of the Proposed Action would be visible from the Pony Express Trail, which would result in cumulative impacts to the visual and recreation setting of the Pony Express Trail through modifications of the form, line, color, and texture elements that are currently viewed from the Pony Express Trail. As stated in Section 4.9.2, the impacts to the Pony Express Trail are anticipated to be negligible to minor, and the cumulative disturbance from the Proposed Action amounts to an approximately two percent disturbance increase within the CESA.

There is already a considerable amount of past mining related disturbance that is already affecting the visual and recreational setting of the Pony Express Trail, as well as two ranch houses (i.e., the Three Bar Ranch and the Roberts Creek Rach). As a result, the cumulative impact from the proposed mine facilities is reduced because the visual setting already has similar disturbances impacting the form, line, color, and texture of the viewshed from the Pony Express Trail. Once the Proposed Action facilities are reclaimed, exception for the open pits, after Project operations cease, the impact to the visual and recreation setting of the Pony Express Trail would be reduced considerably, and would likely return to near pre-Project conditions.

The cumulative actions stated above occur at varying distances from the Pony Express Trail, with some being very close (such as the Atlas 25 kV overhead distribution line and the Mount Hope Project) and others being further in distance from the trail (such as urban development). These varying degrees of distances result in some of the cumulative disturbances stated above having little, if any, impacts to the visual and recreation setting of the Pony Express Trail due to the distance from the trail. Urban development likely has no visual impact to the Pony Express Trail because there is a significant distance between urban development and the trail. However, the

mineral development actions (such as Mount Hope), and the utilities and infrastructure activities have resulted in cumulative impacts to the form, line, color, and texture elements for the visual setting of the trail. The cumulative impact from the Proposed Action when combined with past, present, and RFFAs would be minor. Once the facilities associated with the Proposed Action are reclaimed, cumulative impacts are expected to be negligible.

4.35 Land Use, Access, Realty, and Transportation

4.35.1 CESA Boundary

The CESA for land use, access, realty, and transportation encompasses the portion of Eureka County that is within the Shoshone-Eureka Resource Management Plan from its northern border in Eureka County to U.S. Highway 50 at the south. The CESA also includes a 1,000-foot buffer of the portion of the 25 kV Distribution Line Alternative south of U.S. Highway 50. This CESA includes U.S. Highway 50 from the Township of Eureka to the Eureka County/Lander County border, and all Project access roads (**Figure 4.23-5**). The total area of the CESA encompasses approximately 1,086,663 acres. The CESA boundary was chosen because it is the anticipated extent of cumulative impacts to land use, access, realty, and transportation.

4.35.2 Past and Present Disturbances

Within this CESA, past and present disturbance as detailed in **Table 4.23-2** has resulted from the following activities: mineral development and exploration activities (4,494 acres); sand and gravel operations (3,615 acres); utilities, infrastructure, and public purpose activities (4,723 acres); roads (4,369 acres); urban development (36,393 acres); wildland fires (17,930 acres); agricultural cropping; dispersed recreation; and livestock grazing.

Within the CESA, there is disturbance associated with past and present mineral development and exploration activities and sand and gravel operations. Future disturbance from the authorized but not operating Mount Hope mine would be adjacent to the Proposed Action and within the CESA. Generally, land use impacts from restricted access on the mines when not in operation are minimal and short-term. Impacts from mining and exploration operations may be long-term if left unreclaimed (such as open pits); however, impacts are typically short-term until reclamation is completed and access and use of the area is restored to pre-project conditions.

Mining activities often have impacts to the transportation system by increasing traffic on the surrounding road network. Traffic generation depends on the size and intensity of operations of the facilities. As stated above, Mount Hope is currently not generating any traffic related impacts within the CESA. The traffic impacts of Mount Hope when in operation, are detailed in their approval, and summarized below.

Land use, access, and transportation impacts from utilities and infrastructure are generally short-term, with impacts mainly occurring during construction. However, easements or ROWs associated with the utility lines and other infrastructure can limit non-compatible land uses within the area of the easement or ROW. In addition, utility lines often require routine maintenance,

which could increase traffic within the CESA. The other public purpose sites within the CESA include the Eureka County Sewage Treatment Facility and the Eureka County Volunteer Fire Station. Both uses restrict other land uses within the boundaries of the facilities.

Impacts to land use, access, and transportation resulting from roads are long-term. Construction of roads allows improved access to land uses within the CESA. Additional and improved roads are a result of needs for improved access. Impacts may alter current and future traffic patterns.

Urban development within the CESA includes the Town of Eureka and Diamond Valley. Urban development has a significant effect on land use and access since it often permanently removes the developed areas for other land uses, such as mining and exploration, livestock grazing, or dispersed recreation uses such as hunting, hiking, camping, skiing, etc. Urban development has increased traffic on the transportation system and road network within the CESA. Transportation increases depend on the overall size and density of the urban development, but these areas generally have a more concentrated population, which increases traffic levels when compared to more rural, undeveloped areas. Urban development within the CESA is limited, making up approximately three percent of the CESA, with Diamond Valley being sparsely populated and consisting mostly of agricultural land.

Wildland fires may affect land uses such as dispersed recreation and livestock grazing after they occur, since the burned areas may no longer be suitable livestock forage area, or it may have modified the recreation experience and setting.

Agricultural cropping affects land use because it removes large areas from being used for other multiple use authorizations or land uses. Agricultural operations may also have increased traffic levels within the CESA, although the traffic increase from agricultural operations is likely very low.

Livestock grazing affects land use primarily through restricted access that may occur due to range fencing.

4.35.3 Reasonably Foreseeable Future Disturbances

RFFAs within the land use, access, realty, and transportation CESA would include the following: mineral exploration and development (8,760 acres); sand and gravel operations (565 acres); the Eureka County Landfill (80 acres); and the Perdiz Sport Shooting Range (95 acres) (**Table 4.23-2**). The largest portion of disturbance associated with mining actions is from the Mount Hope Project which is currently not in operation, but is authorized and potentially may begin construction and production in the future, which would result in land use and traffic impacts. Livestock grazing and agricultural cropping are expected to continue within the CESA, as is dispersed recreation. Wildland fires in this CESA would also be expected to occur in the future. These activities would lead to similar impacts as stated for past and present actions. Future restoration projects could also occur in this CESA. There are approximately 282,320 acres of proposed 3 Bars treatment areas in the land use, access, realty, and transportation CESA, which may restrict access to land uses during and after treatments, and may increase traffic on

roadways during treatments. However, future restoration treatments are anticipated to have negligible impacts on ROW authorizations.

4.35.4 Cumulative Disturbances

Of the 1,086,663 acres covered by the lands, realty, and transportation CESA, approximately 81,024 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 82,153 acres, which is approximately eight percent of the CESA.

4.35.5 Cumulative Effects

Cumulative effects to land use, access, realty, and transportation within the CESA from past, present, and RFFAs in combination with the Proposed Action would include: traffic increases on the transportation network within the CESA; loss of public land for multiple use authorizations; access restrictions to land use within the CESA (including for livestock grazing and dispersed recreation); The Proposed Action would result in approximately 1,129 acres of surface disturbance (both proposed disturbance and existing disturbance), a loss of area for multiple land use authorizations for the life of the Project. Approximately 154 acres would not be reclaimed, which would increase long-term impacts to land use. However, this is less than one percent of the total area of the CESA. Considering past, present, and RFFAs within the CESA that may affect land use, access, realty, and transportation combined with the Proposed Action, cumulative effects would be minor, and would largely return to pre-Project conditions within the CESA after the Proposed Action is reclaimed.

However, the Mount Hope Project, when under construction, would significantly increase traffic along some of the transportation routes within the CESA during construction. Mount Hope construction related traffic is estimated to be 3,600 round-trips (trucks and commuting labor) from Eureka and Diamond Valley, and approximately 650 round-trips on U.S. 50 (BLM, 2012a). After construction, the traffic generation from Mount Hope is expected to reduce greatly, with an estimated 26 daily truck trips and 216 daily non-truck (commuting labor) trips consisting of 100 cars, six vans, and two buses for each shift (two shifts would occur). This would be a total of 242 trips per day along State Route 278.

The trip generation associated with the Project would be:

- Approximately 10 heavy vehicle trips per day along Three Bars Road, State Route 278 and U.S. 50 round-trip;
- 40 light vehicle trips per day on Roberts Creek Road and U.S. 50 round-trip from the park-and-ride location; and
- 120 additional trips per day on U.S. 50 in the Town of Eureka round trip from employees driving to and from the park-and-ride location, and an additional 28 light vehicle trips per day on U.S. 50 in the Town of Eureka from the light vehicles that would travel to the site

that would not use vans (i.e., the blasting crew, management pickups, and as needed light vehicles).

If the Proposed Action occurs alongside Mount Hope, cumulative impacts would be moderate to major, as it would result in an additional increased trip generation along State Route 278 and U.S. 50 when combined with the significant traffic increase from the construction of the Mount Hope Project. This is particularly true because the bridge on State Route 278, just north of the Eureka Airport is considered a “deficient bridge” by the NDOT (Lumos, 2005). If the Mount Hope Project did not become operational during the operational life of the Proposed Action, cumulative impacts to traffic would be minor.

4.36 Native American Cultural Concerns

4.36.1 CESA Boundary

The CESA for Native American cultural concerns includes the viewshed of the Project as represented by the Project’s KOPs (**Figure 4.23-2**). The rationale for selecting this as the CESA was based on the results of the visual analysis of facilities within the Project area that would be visible from the KOPs, and includes the area where past, present, and RFFAs may cumulatively impact Native American cultural concerns. This CESA includes the area of potential cumulative impacts to Native American cultural concerns. The total area of the CESA encompasses approximately 1,284,958 acres of both public and private land.

4.36.2 Past and Present Disturbances

Past and present disturbance within the Native American cultural concerns CESA includes the following: mineral exploration and development (3,490 acres); sand and gravel operations (1,591 acres), utilities, infrastructure, and public purpose activities (4,123 acres); roads (3,975 acres); livestock grazing and agricultural cropping; limited urban development (3,740 acres); designated recreation areas (400 acres); dispersed recreations; and wildland fires (1,222 acres).

Federal statutes, regulations, and EOs require consultation with Native Americans when a federal action is taken. Past and present projects on public land would need to have gone through a Native American consultation to determine potential impacts to areas of Native American concern. If funerary objects, or items of cultural patrimony on BLM-administered land are encountered during construction, activities would need to cease within the vicinity of the discovery, and the BLM Authorized Officer would be contacted.

The past and present actions in the CESA may have resulted, or may result, in illegal collecting and/or inadvertent damage to sites of tribal concern. As stated above, items or areas of tribal concern that may have been, or may be, discovered during environmental analysis of past or present projects, or during construction of these projects, would be dealt with through guidelines set up under an agreement between the proponent, the BLM and the SHPO.

4.36.3 Reasonably Foreseeable Future Disturbances

RFFAs within the Native American cultural concerns CESA would include the following: mineral exploration and development (9,434 acres); sand and gravel operations (265 acres); and the Eureka County Landfill (80 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. In addition, future restoration projects could also occur in this CESA. There are approximately 123,653 acres of proposed 3 Bars treatment areas in the Native American cultural concerns CESA. These activities would lead to similar impacts as stated for past and present actions.

4.36.4 Cumulative Disturbances

Of the 1,284,958 acres covered by the Native American cultural concerns CESA, approximately 28,320 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately two percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 29,449 acres, which is approximately two percent of the CESA.

4.36.5 Cumulative Effects

Under the Proposed Action, to date, no TCP, property of traditional religious cultural importance, or sacred site has been identified by the tribe or bands participating in the government-to government consultation process or through cultural resources inventories. Cumulative actions and disturbances within the CESA may have resulted in impacts to native American cultural concerns, including displacement of soil containing Native American cultural materials, disturbing Native American historic features, displacing Native American cultural material from its original context, and visual or auditory impacts to Native American cultural site's setting. In addition, illegal collecting or destruction of artifacts may have occurred throughout the CESA. However, as stated above, projects occurring on federal land, or those having a state or federal nexus would need to comply with Native American consultation requirements during project approval, and impacts to any Native American cultural or traditional sites would need to be mitigated through specified in an appropriate agreement between the BLM, the proponent, and SHPO. Cumulative impacts to Native American cultural concerns from past, present, and RFFAs when combined with the Proposed Action would result in no historic properties affected.

4.37 Noise

4.37.1 CESA Boundary

The CESA for noise includes the Diamond and Three Bar Population Management Units (PMUs) (**Figure 4.23-10**). This CESA boundary was chosen because it represents the area where past, present, and RFFAs may have cumulative noise impacts on greater sage-grouse populations, as well as communities or residences surrounding the Project area. The total area of the CESA encompasses approximately 1,631,044 acres of both public and private land.

4.37.2 Past and Present Disturbances

Past and present disturbance within the noise CESA includes the following: mineral exploration and development (8,047 acres); sand and gravel operations (5,278 acres), oil, gas, and

geothermal development (nine acres); utilities, infrastructure, and public purpose activities (6,489 acres); roads (6,861 acres); livestock grazing and agricultural cropping; limited urban development (36,856 acres); dispersed recreation; and wildland fires (30,668 acres).

Mineral exploration and development, and sand and gravel operations, all result in some level of noise impacts to the surrounding area. The may include vehicle noise (including from heavy vehicle noise), generator noise, aggregate crushing noises, and blasting noise. Noise impacts from oil, gas, and geothermal development are similar to those specified for mineral exploration and development activities.

Noise impacts from utilities, infrastructure, and public purpose activities generally occur during construction of the utilities and infrastructure. Maintenance of utilities would result in very little noticeable noise levels. Public purpose sites such as the Eureka County Sewage Treatment Facility may have noise impacts associated with operation of the facility. However, these noise levels are likely minimal.

Roads within the CESA likely result in some level of noise impact due to vehicle traffic on the road. OHV traffic may also result in noise impacts.

Livestock grazing and agricultural cropping have very little noise associated with these actions.

Urban development typically has more noise associated with it than areas where development is not occurring.

4.37.3 Reasonably Foreseeable Future Disturbances

RFFAs within the noise CESA would include the following: mineral exploration and development (11,757 acres); sand and gravel operations (671 acres); utilities, infrastructure, and public purpose sites (246 acres); and the Perdiz Sport Shooting Range (95 acres) (**Table 4.23-2**). In addition, future restoration projects could also occur in this CESA. There are approximately 282,320 acres of proposed 3 Bars treatment areas in the noise CESA. These activities would lead to similar impacts as stated for past and present actions.

4.37.4 Cumulative Disturbances

Of the 1,631,044 acres covered by the noise CESA, approximately 106,977 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 108,106 acres, which is still approximately seven percent of the CESA. However, noise impacts are less a result of acreage disturbance, and more of a result of the types of equipment and level of use of the equipment associated with past, present, and RFFAs.

4.37.5 Cumulative Effects

Cumulative effects resulting from past, present, and RFFAs in combination with the Proposed Action may include increased noise levels within the CESA. The Proposed Action is not expected

to generate hourly noise levels exceeding the EPA exterior noise criteria of 55 dBA L_{eq}. Cumulative impacts from noise from the Proposed Action in addition to the past present and RFFAs would be minor.

4.38 Paleontological Resources

4.38.1 CESA Boundary

The CESA for paleontological resources includes the viewshed of the Project as represented by the Project's KOPs (**Figure 4.23-2**). This CESA boundary was chosen because it represents the area where past, present, and RFFAs may have cumulative impacts to paleontological resources. The total area of the CESA encompasses approximately 1,284,958 acres of both public and private land.

4.38.2 Past and Present Disturbances

Past and present disturbance within the cultural resources CESA includes the following: mineral exploration and development (3,490 acres); sand and gravel operations (1,591 acres), utilities, infrastructure, and public purpose activities (4,123 acres); roads (3,975 acres); livestock grazing and agricultural cropping; limited urban development (3,740 acres); designated recreation areas (400 acres); dispersed recreations; and wildland fires (1,222 acres).

The main impacts to paleontological resources often are the result of illegal collecting activities. Past roads and present roads may have resulted in easier access to paleontological resources, which may have provided opportunities for illegal collecting activities. Ground-disturbing activities may destroy paleontological resources if a field survey by a qualified paleontologist is not conducted prior to surface disturbing activities.

The various mineral development and exploration projects and other surface disturbances within the paleontological resources CESA are located on a variety of geologic formations with varying fossil potential. Not all disturbances would pose a risk to fossil resources, particularly if the geologic formation is non-fossil-bearing, and if a field survey was completed and mitigation measures were in place prior to ground-disturbing activities.

4.38.3 Reasonably Foreseeable Future Disturbances

RFFAs within the paleontological resources CESA would include the following: mineral exploration and development (9,434 acres); sand and gravel operations (265 acres); and a public purpose site [Eureka County Landfill] (80 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. These activities would lead to similar impacts as stated for past and present actions. RFFAs occurring in non-fossil-bearing geologic formations would not impact or affect paleontological resources. In addition, future restoration projects could also occur in this CESA. There are approximately 123,653 acres of proposed 3 Bars treatment areas in the paleontological resources CESA. However, since most treatments would occur at or above the soil surface, risks to paleontological resources from treatment project would be considered negligible.

4.38.4 Cumulative Disturbances

Of the 1,284,958 acres covered by the paleontological resources CESA, approximately 28,320 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately two percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 29,449 acres, which is approximately two percent of the CESA.

4.38.5 Cumulative Effects

Cumulative effects resulting from past, present, and RFFAs in combination with the Proposed Action may include disturbance of paleontological resources or illegal collecting. Under the Proposed Action, the Bartine Member of the McColley Canyon Formation (host for fragmental placodermi) would be excavated during mining operations. This may expose any contained paleontological resources. In addition, previous exposure of invertebrate fossils in the Gold Pick open pit may also be impacted by Project activities. However, if paleontological resources are discovered during mining operations, work around the resource would cease and the Authorized Officer for the BLM would be contacted and long-term impacts of the Proposed Action on paleontological resources within the region is anticipated to be negligible. Cumulative impacts to paleontological resources from the Proposed Action in addition to the past present and RFFAs would be negligible.

4.39 Recreation

4.39.1 CESA Boundary

The CESA for recreation resources encompasses the portion of Eureka County that is within the Shoshone-Eureka Resource Management Plan from its northern border in Eureka County to U.S. Highway 50 at the south. The CESA also includes a 1,000-foot buffer of the portion of the 25 kV Distribution Line Alternative south of U.S. Highway 50. This CESA includes U.S. Highway 50 from the Township of Eureka to the Eureka County/Lander County border, and all Project access roads (**Figure 4.23-5**). The total area of the CESA encompasses approximately 1,086,663 acres. The CESA boundary was chosen because it is the anticipated extent of cumulative impacts to recreation resources.

4.39.2 Past and Present Disturbances

Within the recreation resources CESA, past and present disturbance as detailed in **Table 4.23-2** has resulted from the following activities: mineral development and exploration activities (4,494 acres); sand and gravel operations (3,615 acres); utilities, infrastructure, and public purpose activities (4,723 acres); roads (4,369 acres); urban development (36,393 acres); wildland fires (17,930 acres); agricultural cropping; dispersed recreation; and livestock grazing.

Mineral development and exploration operations in the CESA often limit public access to areas previously used for dispersed recreation. In addition, they may reduce the recreational value and modify the recreational setting when vegetation and/or wildlife are affected, and may result in visual and noise impacts for those recreation users seeking experiences of isolation and solitude. These actions may also displace recreationists to surrounding areas. Mount Hope is within the

CESA, but is currently not an operating mine, so impacts to recreation resources from restricted access not presently occurring from the Mount Hope Project. Impacts to recreation resources from mining and exploration operations may be long-term if left unreclaimed (such as open pits); however, impacts are typically short-term until reclamation is completed and access and use of the area is restored to pre-Project conditions. In addition, mining activities may increase the population of an area by bringing in mine employees and workers to the areas which may increase the use of recreation areas within the CESA.

Past and present disturbance associated with utilities, infrastructure, and public purpose projects in the CESA include transmission lines, telephone and fiber optic lines, water, and sewer infrastructure. Lands occupied by utilities, infrastructure are generally still available for dispersed recreation activities, but the recreation setting may have changed due to the presence of man-made features (e.g., power lines and telephone poles). These facilities often include maintenance roads which may increase OHV use in the area, and allow vehicular access to areas that previously had little, if any, OHV traffic. Public purpose sites such as the Eureka County Sewage Treatment Facility and the Eureka County Volunteer Fire Station have resulted in these areas no longer being available for dispersed recreation.

Road disturbance within the CESA provides access to recreation areas, and can also become a form of recreation. For those seeking solitude and a primitive outdoor experience, development of roads can impact the recreation experience by modifying the recreation setting with the visual appearance and noise of road traffic, as well as the increased vehicular traffic.

Urban development may restrict access for recreational use and create visual impacts for those seeking solitude and a primitive outdoor experience. However, urban development often includes designated recreation areas such as athletic fields, pools, parks, fair grounds, which is the case for the Town of Eureka. Diamond Valley does not have designated recreation areas, and is primarily a sparsely populated, agricultural community. Dispersed recreation would be restricted around the agricultural cropping areas in Diamond Valley.

Wildland fires may affect recreation resources it would temporarily affect the area available for dispersed recreation, and would impact the recreation setting until revegetation and/or reclamation occurs on the burned area. However, wildland fires do not typically restrict access for recreation activities.

Livestock grazing is not inconsistent with dispersed recreation, and impacts are largely from restricted access to potential recreation areas that may occur from range fencing.

4.39.3 Reasonably Foreseeable Future Disturbances

RFFAs within the recreation CESA would include the following: mineral exploration and development (8,760 acres); sand and gravel operations (565 acres); the Eureka County Landfill (80 acres); and the Perdiz Sport Shooting Range (95 acres) (**Table 4.23-2**). The largest portion of disturbance associated with mining actions is from the Mount Hope Project which is currently

not in operation, but is authorized and potentially may begin construction and production in the future. This would include potential impacts to recreation such as access restrictions and modification of the recreational setting of the area. Livestock grazing and agricultural cropping are expected to continue within the CESA, as is dispersed recreation. Wildland fires in this CESA would also be expected to occur in the future. In addition, future restoration projects could also occur in this CESA. There are approximately 282,320 acres of proposed 3 Bars treatment areas in the recreation CESA, which may restrict or reduce recreation areas during and after treatments. These activities would lead to similar impacts to recreation as stated for past and present actions.

4.39.4 Cumulative Disturbances

Of the 1,086,663 acres covered by the recreation CESA, approximately 81,024 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 82,153 acres, which is approximately eight percent of the CESA.

4.39.5 Cumulative Effects

For the most part, effects from past, present, and RFFAs within the recreation CESA would be short-term, except for mining features that are not reclaimed (e.g., pits, TSFs, etc.). In addition, transmission lines and above ground utilities would result in long-term visual impacts to recreation resources. Impacts from past, present, and RFFAs would include restricted access to recreation areas, displacement of recreationists to surrounding areas, potential increase in the population of recreationists, and impacts to the recreation setting. The Proposed Action would restrict access to areas that are fenced for active mining operations, and would leave approximately 154 acres unreclaimed. Some recreationists may be displaced to surrounding areas during mining operations, and the recreation setting may be impacted. However, there is already a significant amount of disturbance affecting recreation, and after reclamation occurs, dispersed recreation would return to near pre-Project conditions. The Proposed Action is less than one percent of the CESA, so cumulative impacts from the Proposed Action would be minor during operations, and negligible after reclamation occurs.

4.40 Social and Economic Values

4.40.1 CESA Boundary

The CESA for social and economic values is Eureka County and encompasses approximately 2,673,325 acres (**Figure 4.23-7**). This CESA boundary was chosen because individuals and businesses that would be cumulatively affected by the Proposed Action and alternatives are in Eureka County.

4.40.2 Past and Present Disturbances

All data in Section 3.15 on socioeconomic conditions, fiscal conditions, public services, and utilities apply to the CESA analysis. The past and present land uses in the CESA have had a direct effect on the social and economic condition of Eureka County. The mining industry is a

major industry in Eureka County. There are several major mines, which have a direct impact on the economic and social condition within Eureka County, including Ruby Hill, Tonkin Springs (currently in closure), portions of Cortez Mine, and the Carlin Trend Open Pit Gold Operations by Barrick and Newmont. Mount Hope is an authorized mine within Eureka County, but it is currently not active and is not generating any socioeconomic impacts in present conditions.

According to 2015 data for the Nevada Department of Employment, Training, and Rehabilitation, the primary employment base in Eureka County was the mining, quarrying, oil and gas extraction, and natural resources industry, followed by the trade, transportation and utilities industry, the agriculture industry, and the retail and trade industry, respectively (NDETR, 2015). The Diamond Valley area includes numerous agricultural operations, with principal crops of alfalfa, timothy, and grass mix hays (Eureka County, 2010). Agriculture is an important part the Eureka County economy.

All of these activities, particularly the mining industry, likely increase employment levels within Eureka County, as well as use of public services and infrastructure, an increased need for housing, and potentially effects on public sector revenues and/or expenditures. These impacts may be positive, increasing employment opportunities in Eureka County and potentially drawing on the local and regional workforce. However, if the demand for labor cannot be met by the region's labor pool, the activities may, or may have led to an influx of non-local workers, which has resulted in socioeconomic impacts from the increased need to accommodate the non-local workers.

4.40.3 Reasonably Foreseeable Future Disturbances

Reasonably foreseeable projects include mineral exploration and new and continuing mining operations. Future mining operations within the CESA include exploration and some existing mining operations expansions. The mining operations discussed above are expected to continue operations and potentially expand. The Mount Hope Project would likely begin operation sometime in the future. Over the first 24 months of construction and operations, direct on-site employment would result in an average of approximately 567 jobs, with a three-month peak of approximately 775 combined construction and operations workers (BLM, 2012a). Other projects may include oil, gas, and geothermal development, utility construction, communication facilities, and potential urban development within the population centers of Eureka County. Other potential mining activities that may occur within Eureka County in the future include: the Norse Windfall Exploration Project; the Windfall Project; the Prospect Mountain Exploration Drilling Project; the Gold Canyon Mine; and the Gibellini Mine. Impacts from RFFAs would be similar to those discussed for past and present actions.

In addition, future restoration projects could occur in the CESA. Restoration treatment projects could result in short-term reductions in authorized grazing levels and subsequent downward pressure on ranch income as a result of grazing restrictions and increases in the required amount of livestock management. Social effects could include effects on ranchers, outfitters, individual recreationists, some business owners, local law enforcement and fire departments in Eureka

County, and others affected directly and indirectly by changes in access, temporary closures, or other restrictions associated with the mechanical and fire treatments. These effects would manifest themselves in terms of concerns for social and economic well-being, increased satisfaction or dissatisfaction with public lands management by the MLFO, and quality of life in general. Some individuals may also experience dissatisfaction with the types and locations of treatments proposed. Restoration projects could also generate a temporary local economic stimulus (e.g., purchases of materials and supplies, equipment-related rentals and leases, and retail and lodging expenditures) associated with BLM and contractor efforts and jobs. Successful treatment projects could also result in long-term benefits associated with future increase in the level of authorized grazing use (BLM, 2016f).

4.40.4 Cumulative Disturbances

The Eureka County economy is largely dependent on the mining industry, and industries serving the mining industry. The market price for gold, silver, and other extracted minerals drives the mining activity in the regions. When mineral prices are high, employment and wages rise and there often becomes a shortage of skilled workers. Yet as mineral prices drop or other limitations on mines develop, there is a reversal in the upward economic trends. The unpredictable pattern of economic highs and lows can be detrimental to the county's financial stability and its ability to plan and provide reliable services for the community.

4.40.5 Cumulative Effects

The Proposed Action in addition to the past, present, and RFFAs would contribute to the cumulative effects on socioeconomics. It would result in increased employment, income, and the demand for housing, schools, law enforcement, fire protection, other services, and infrastructure. The Proposed Action is anticipated to have a maximum combined employment of 135 people. Construction operations are more likely associated with non-local labor. This may create an influx of non-local workers needing temporary housing. The workforce for the operations phase of the Proposed Action is more likely to come from the local area. The Proposed Action, when combined with past, present, and RFFAs would result in minor cumulative impacts to the social and economic values of the CESA.

4.41 Soils

4.41.1 CESA Boundary

The CESA for soils resources includes the Kobeh Valley Hydrographic Basin (#139) and the Diamond Valley Hydrographic Basin (#153), and extends six miles (10 kilometers) north of the Kobeh Valley Hydrographic Basin (**Figure 4.23-1**). The total area of the CESA encompasses approximately 1,120,249 acres. This CESA was selected because it is the anticipated extent of cumulative impacts to soils resources.

4.41.2 Past and Present Disturbances

Past and present disturbance within the soils CESA includes the following: mineral exploration and development (4,181 acres); sand and gravel operations (3,400 acres), utilities, infrastructure,

and public purpose activities (4,779 acres); roads (4,438 acres); livestock grazing and agricultural cropping; limited urban development (36,856 acres); dispersed recreation; and wildland fires (13,765 acres).

Past and present mineral development and exploration actions, and sand and gravel operations within the soils CESA have not all been actively reclaimed; however, natural reclamation of vegetation species has likely occurred at the site of past activities over time which has resulted in various levels of revegetation, which is important for soil stability and erosion prevention. Impacts of past and present mineral development and exploration may be long-term since soil is physically removed and then replaced during reclamation. If an area is not reclaimed, or soils are not salvaged, existing soils may be buried. The primary effect of mining on soil resources is a temporary decrease in overall soil quality, reduction in soil production capabilities for vegetation and wildlife, potentially increased soil erosion, and subsequently, an increase in sediment in downstream surface waters.

Disturbance to soil resources associated with utility and infrastructure projects involves construction of access roads, as well as temporary staging areas, which leads to soil compaction and removal of vegetation. In addition, the Eureka County Sewage Treatment Facility and the Eureka County Volunteer Fire Station likely permanently removed soil for the areas where the facilities are located.

Road construction has a long-term effect on soil resources. Effects from unimproved roads include compaction of the ground, burial of soils and altering water flow on the soil surface. U.S. Highways and State Routes are paved with asphalt or concrete, which permanently affects the soil in the area and increases run-off from the impermeable surface; this has the potential to increase erosion of adjacent soils.

Livestock grazing and agriculture cropping have likely impacted soils on within the CESA. These activities may have resulted in a shift in vegetation communities that may have impacted soil quality.

Urban development permanently affects soil through compaction of the ground, ground disturbance activities (e.g., permanent removal of soils), and the increase in impermeable surface (e.g., concrete, asphalt, etc.) which may concentrate runoff and increase the potential for erosion of adjacent soils.

Wildland fires remove vegetation, which creates the potential to increase the risk of soil erosion. Extremely hot fires have the ability to change the top layers of the soil by altering the soil structure, productivity, chemistry, and hazard of erosion.

4.41.3 Reasonably Foreseeable Future Disturbances

RFFAs within the soils CESA would include the following: mineral exploration and development (8,796 acres); sand and gravel operations (614 acres); utilities, infrastructure, and public purpose

activities (90 acres); and a recreation facility [Perdiz Sport Shooting Range] (95 acres) (**Table 4.23-2**). Wildland fires in this CESA are also expected to occur in the future, as would livestock grazing and dispersed recreation. These activities would lead to similar impacts as stated for past and present actions. In addition, future restoration projects could occur in this CESA. There are approximately 187,874 acres of proposed 3 Bars treatment areas within the soils CESA, which may increase erosion and soil compaction, and reduce organic matter cover (i.e., changing the soil properties and chemistry), which would change soil productivity.

4.41.4 Cumulative Disturbances

Of the 1,120,249 acres covered by the soils CESA, approximately 77,014 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 78,143 acres, which is approximately seven percent of the CESA.

4.41.5 Cumulative Effects

Effects to soil resources under the Proposed Action would be long-term and minor to moderate due to construction activities and topsoil salvage. Erosion from storm water runoff and land affected by the mine would be controlled with BMPs. All past, present, and RFFAs within the CESA would have, or would most likely employ, similar BMPs, which would reduce cumulative impacts to soils. Restoration projects could have adverse effects on soil condition and productivity, but overall would be less severe than wildfire and erosion that would result from the lack of restoration (BLM, 2016f). Considering past, present, and RFFAs in the soil resources CESA that may affect soils combined with the Proposed Action, cumulative effects to soils would be minor to moderate depending on the success reclamation success of mine related disturbance over time.

4.42 Vegetation (Including Noxious Weeds and Non-native Invasive Species)

4.42.1 CESA Boundary

The CESA for vegetation resources includes the Kobeh Valley Hydrographic Basin (#139) and the Diamond Valley Hydrographic Basin (#153), and extends six miles (10 kilometers) north of the Kobeh Valley Hydrographic Basin (**Figure 4.23-1**). The total area of the CESA encompasses approximately 1,120,249 acres. This CESA was selected because it is the anticipated extent of cumulative impacts to soils resources.

4.42.2 Past and Present Disturbances

Past and present disturbance within the vegetation CESA includes the following: mineral exploration and development (4,181 acres); sand and gravel operations (3,400 acres), utilities, infrastructure, and public purpose activities (4,779 acres); roads (4,438 acres); livestock grazing and agricultural cropping; limited urban development (36,856 acres); dispersed recreation; and wildland fires (13,765 acres).

Impacts to vegetation from mineral development and exploration activities and sand and gravel operations in the CESA include vegetation removal and the potential introduction or spread of noxious weeds and non-native invasive species. While some of these past projects have not been actively reclaimed, natural re-establishment of vegetation has occurred over time resulting in various levels of revegetation. Present mineral development and exploration actions are subject to reclamation requirements. Impacts from mineral development and exploration can be long-term. Re-establishment of vegetation would eventually occur on mining disturbances, whether through the revegetation measures required for specific projects or through natural revegetation. Noxious weeds and non-native invasive species are more likely to establish in disturbed areas; therefore, successful reclamation assists to limit the spread of these species.

Within the vegetation CESA, disturbance associated with utilities, infrastructure, public purpose activities included native vegetation removal during construction, which may have increased the likelihood of noxious weeds and non-native invasive species establishment. After construction of utility and infrastructure projects, access roads remain for maintenance, which creates a long-term impact to vegetation in the CESA. These roads may be used by those who would not have otherwise traveled to these locations (i.e., recreational use), which may lead to the spread and establishment of noxious weeds and non-native invasive species. In addition, the Eureka County Sewage Treatment Facility and the Eureka County Volunteer Fire Station likely permanently removed vegetation for the areas where the facilities are located.

Disturbance associated with roads in the CESA have affected vegetation since the road area includes vegetation removal, and areas disturbed by vehicles are often slower to re-establish because the soils have been compacted. Noxious weeds and non-native invasive species are often the first species to establish, especially along road corridors and where vehicles travel off-road. Vehicles that travel off-road spread seeds of noxious weeds and non-native invasive species, and roads create access into areas that might not otherwise have been accessible.

Urban development typically removes the native vegetation from the area, and replaces it with structures and impermeable surfaces, such as concrete or asphalt. In areas that are disturbed and not properly revegetated, it may allow for the establishment of noxious weeds and invasive, non-native species.

Other activities such as grazing and agriculture cropping, which are not quantified in **4.23-2,** also affect vegetation. Grazing results in habitat removal/conversion and affect wildland fire regimes. Proper rotation and stocking rates can minimize these impacts to vegetation. Agricultural cropping removes native vegetation and replaces it with crops.

All of these activities may have had impacts on special status plant species, including removal or habitat or destruction of individuals or populations of special status plant species. However, projects on federal land would be required to conduct biological baseline surveys, including special status plant surveys. If special status plants, or their habitat, are discovered during surveys, appropriate mitigation measures would need to be put in place prior to a project beginning construction activities.

4.42.3 Reasonably Foreseeable Future Disturbances

RFFAs within the vegetation CESA would include the following: mineral exploration and development (8,796 acres); sand and gravel operations (614 acres); utilities, infrastructure, and public purpose activities (90 acres); and a recreation facility [Perdiz Sport Shooting Range] (95 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. These activities would lead to similar impacts as stated for past and present actions.

In addition, future restoration projects could occur in this CESA. There are approximately 187,874 acres of proposed 3 Bars treatment areas within the vegetation CESA. Future treatment projects in the CESA could result in temporary loss of desirable and mature vegetation but are expected to increase the extent of native plant communities therefore having a beneficial impact in the CESA (BLM, 2016f). Treatments may also increase the potential spread of noxious and non-native invasive species if treatments are not successful. In addition to this restoration project, a proposed roadside fuels project would conduct mowing activities along roadsides within the CESA to reduce the risk of fire.

4.42.4 Cumulative Disturbances

Of the 1,120,249 acres covered by the vegetation CESA, approximately 77,014 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 78,143 acres, which is approximately seven percent of the CESA.

4.42.5 Cumulative Effects

Considering past, present, and RFFA disturbance in the vegetation CESA combined with the Proposed Action, cumulative effects would be minor since the vegetation community types are common and widespread throughout the CESA. Impacts from the Proposed Action on special status species would be negligible since no special status species were identified during Project baseline surveys, and habitat for special status species is either non-existent, or limited within the Plan boundary. Potential cumulative impacts to the known occurrence of the Monte Neva Indian paintbrush, a Nevada endemic species considered critically endangered, that occurs within 1.5 miles of Three Bars Road, may include the potential spread of noxious, non-native invasive weeds from past, present, and RFFAs when combined with the Proposed Action. However, the implementation of the Project's weed management plan, in addition to the fact that no new disturbance would occur on these roads, would reduce the potential spread of noxious, non-native, invasive weeds, so the cumulative impact to this species from the Project would be negligible. Impacts from the Project to vegetation are considered minor, since some features would be reclaimed following closure and other features would remain unreclaimed and not revegetated. Considering past, present, and RFFA disturbance in the vegetation CESA combined with the Proposed Action, cumulative effects would be minor.

4.43 Visual Resources

4.43.1 CESA Boundary

The CESA for visual resources includes the viewshed of the Project as represented by the Project's KOPs (**Figure 4.23-2**). The rationale for selecting this as the CESA was based on the results of the visual analysis of facilities within the Project area that would be visible from the KOPs. This CESA includes the area of potential cumulative impacts to visual resources. The total area of the CESA encompasses approximately 1,284,958 acres of both public and private land.

4.43.2 Past and Present Disturbances

Past and present disturbance within the visual CESA includes the following: mineral exploration and development (3,490 acres); sand and gravel operations (1,591 acres), utilities, infrastructure, and public purpose activities (4,123 acres); roads (3,975 acres); livestock grazing and agricultural cropping; limited urban development (3,740 acres); designated recreation areas (400 acres); dispersed recreations; and wildland fires (1,222 acres).

Past and present mineral exploration and development in the CESA, and sand and gravel operations have introduced line, form, color, and texture elements that contrast with the existing landscape. Past disturbances are in various stages of natural revegetation, which reduces the overall visual impact from past disturbances. Present disturbances would most likely require reclamation, which would help to reduce visual impacts within the CESA. However, these operations are currently impacting the visual landscape of the CESA.

Unless they are buried, utilities and other linear projects introduce form and line elements (i.e., poles and power lines) that contrast with the surrounding features of the existing landscape. These form and line elements result in long-term visual impacts to the existing landscape. Buried utility lines result in a short-term visual impact by removing vegetation, which would result in impacts to the texture and form of the landscape. However, after reclamation, the majority of surface disturbance resulting from utility and infrastructure (both buried and above-ground) blends in more with the existing landscape, and reclamation reduces the long-term visual impact from surface disturbance of utilities and infrastructure.

Roads have introduced form, line, and texture elements that contrast with the features of the existing landscape. Roads within the CESA create curvilinear, continuous lines with varying textures depending on the road surfacing.

Urban development introduces form, line, color, and texture elements that contrast with the features of the existing landscape. These impacts are often permanent modifications to the landscape. Agricultural cropping within the CESA (around Diamond Valley) would add different form, line, color, and texture elements to the existing landscape.

The designated recreation area within the visual CESA includes the Hickison Petroglyph Recreation Area. The visual impacts resulting from this area would include the informational

signs/monuments, which introduces form, line, color, and texture elements different from the existing landscape.

Wildfire impact form, line, color, and texture elements of the existing landscape.

4.43.3 Reasonably Foreseeable Future Disturbances

RFFAs within the visual CESA would include the following: mineral exploration and development (9,434 acres); sand and gravel operations (265 acres); and a public purpose site [Eureka County Landfill] (80 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. These activities would lead to similar impacts as stated for past and present actions.

In addition, future restoration projects could also occur in this CESA. There are approximately 123,653 acres of proposed 3 Bars treatment areas in the visual CESA as well as mowing associated with the roadside fuels project. Both of these project may modify the form, line, color, and texture of the treatment areas.

4.43.4 Cumulative Disturbances

Of the 1,284,958 acres covered by the visual CESA, approximately 28,320 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately two percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 29,449 acres, which is approximately two percent of the CESA.

4.43.5 Cumulative Effects

Considering past, present, and RFFAs within the CESA that may affect visual resources combined with the Proposed Action, cumulative effects to visual resources would include line, form, color, and texture elements that would contrast with the existing landscape. Past and present actions on BLM administered land would be subject to reclamation, which would reduce long-term impacts. However, there are likely unreclaimed features associated with past and present mining activities and utilities impacting the long-term visual landscape. The Proposed Action would have a moderate degree of contrast with the existing visual landscape during operations. Since reclamation would be completed on the majority of the Proposed Action, visual impacts would be reduced in the long term. However, the features not reclaimed would result in long-term visual impacts from the Proposed Action within the CESA. Potential restoration treatment projects in the CESA also have the potential to disturb surface features of the landscape and impact scenic values in the short term, however treatment projects are designed to restore the natural landscape and would improve the scenic quality of the landscape in the long term (BLM, 2016f). The cumulative effects from the Proposed Action in addition to the past, present and RFFAs on the visual resources CESA would be minor to moderate in the short-term (during operations), and negligible to minor in the long-term and would primarily be associated with the features that would not be reclaimed.

4.44 Water Quality and Quantity

Cumulative impacts to water resources are considered from impacts to surface water, ground water, and geochemistry.

4.44.1 CESA Boundary

The CESA for water quality and quantity includes the Kobeh Valley Hydrographic Basin (#139) and the Diamond Valley Hydrographic Basin (#153), and extends six miles (10 kilometers) north of the Kobeh Valley Hydrographic Basin (**Figure 4.23-1**). The total area of the CESA encompasses approximately 1,120,249 acres. This CESA was selected because it is the anticipated extent of cumulative impacts to water resources.

4.44.2 Past and Present Disturbances

Past and present disturbance within the water quality and quantity CESA includes the following: mineral exploration and development (4,181 acres); sand and gravel operations (3,400 acres), utilities, infrastructure, and public purpose activities (4,779 acres); roads (4,438 acres); livestock grazing and agricultural cropping; limited urban development (36,856 acres); dispersed recreation; and wildland fires (13,765 acres).

The past and present activities listed in **Table 4.23-2** that occur within the CESA likely affect the quantity or quality of surface water and/or groundwater to some extent. Mining activities (including sand and gravel operations) have used, or are currently using water (typically groundwater) as part of their operations, either for dust control, processing, or dewatering. General surface disturbance can cause the following impacts to water resources: sediment loading; channel rerouting can cause erosion/sedimentation; and inadvertent spills of process water, drilling fluids, or other hazardous substances can contaminate surface water or shallow groundwater. Management of groundwater in dewatering operations, both groundwater extraction and injection or infiltration, can affect the local groundwater availability and quality.

Previous construction associated with utilities and roads may have used water during construction, and the largest potential post-construction effect is likely related to erosion and sedimentation associated with access roads or reclaimed disturbances. All roads may result in water quality impacts due to inadvertent spills or releases from vehicles. Unpaved roads, such as those crossing public lands in the CESA, can also be a source of increased erosion and sedimentation. Paved roads may cause water quality issues resulting from increased stormwater run-off. Public purpose facilities such as the Eureka County Sewage Treatment Facility and the Eureka County Volunteer Fire Station may also increase stormwater run-off; however, the design of those facilities likely included appropriate stormwater control measures to prevent unnecessary degradation to surface waters.

Other activities such as grazing and irrigation for agriculture, that are not quantified in **Table 4.23-2** also have potential consequences to water quality and quantity because they use water and involve surface disturbance. In addition, there is the potential for water contamination

depending on whether fertilizers, or chemical herbicides/pesticides are used in association with agricultural cropping.

Urban development within the CESA is limited and includes the town of Eureka and Diamond Valley. Surface disturbance from urban development may result in cumulative surface run-off due to an increase in impermeable surfaces. Potential surface water contamination may occur from erosion, petroleum spills and fertilizer use (e.g., on lawns or landscaping), which may impact water quality. Urban development also increases water use within the basin. The largest user of municipal water within the Diamond Valley basin is likely the town of Eureka. However, the largest water user within the Diamond Valley Basin (Basin 153) is irrigation, which uses approximately 125,957 AFY, whereas the municipal water use is far less at 1,679 AFY (NDWR, 2016).

Finally, several previous wildland fires may have resulted in channel incision and potentially continue to provide elevated sediment loads to CESA area stream channels. In sum, all of these past and present activities have the potential to affect water resources.

4.44.3 Reasonably Foreseeable Future Disturbances

RFFAs within the water quality and quantity CESA would include the following: mineral exploration and development (8,796 acres); sand and gravel operations (614 acres); utilities, infrastructure, and public purpose activities (90 acres); and a recreation facility [Perdiz Sport Shooting Range] (95 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. These activities would lead to similar impacts as stated for past and present actions.

In addition, future restoration projects could also occur in this CESA. There are approximately 187,874 acres of proposed 3 Bars treatment areas in the water resources CESA, which may result in increased surface runoff and soil erosion from vegetation removal and soil compaction. This may reduce surface water quality. Restoration projects may also reduce water infiltration and groundwater recharge, and may decrease groundwater quality by an influx of nutrients that would otherwise be consumed by the vegetation that has been removed (BLM, 2016f). However, restoration projects typically focus on maintaining connections between streams and floodplains, increasing infiltration, decreasing overland flow, reducing discharge velocity, and encouraging riparian plant establishment (BLM, 2016f).

The Mount Hope Project is not currently operational. However, the Mount Hope Project would include dewatering, and is anticipated to have impacts to water quality and quantity. The ground water drawdown is predicted to be more than 10 feet, which would have long-term impacts (estimated at 100 years from post mining operations at Mount Hope) to approximately seven wells with active ground water rights, two perennial stream segments (Roberts Creek and South Fork of Henderson Creek), and 22 perennial or potentially perennial spring sites (BLM, 2012a). Mitigation is proposed for the Mount Hope Project to reduce impacts to water quality and quantity.

Oil and gas development within the water quality and quantity CESA typically uses water, and has the potential to degrade both surface water and groundwater if drilling fluids are not properly managed, or if wells are not properly developed. New roads are often built in association with oil and gas development, with the same potential consequences as mentioned above.

4.44.4 Cumulative Disturbances

Of the 1,120,249 acres covered by the CESA, approximately 77,014 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 78,143 acres, which is approximately seven percent of the CESA.

4.44.5 Cumulative Effects

Considering past, present, and RFFAs within the CESA that may affect water quality and quantity combined with the Proposed Action, cumulative effects would include increased water use within the CESA which may result in a reduction of base flow to perennial streams or springs, and may impact ground water wells and water rights within the CESA. Additional cumulative impacts may be increased erosion and sedimentation impacting surface water quality. The Proposed Action does not include dewatering, and impacts to surface water resources within or adjacent to the proposed mining operations are not expected. Under the maximum pumping scenario of 500 gpm for seven years, the Proposed Action may result in a 25-foot drawdown at the Roberts Creek Ranch well, which would return to pre-pumping levels within a few weeks of cessation of Project ground water pumping. The Project is not anticipated to impact surface water quantity in Roberts Creek.

Impacts to groundwater from past, present, and RFFAs, combined with the Proposed Action, would be moderate, particularly because of the cumulative impact from ground water pumping associated with the Mount Hope Project, which would result in an additional estimated 10-foot drawdown at the Roberts Creek Ranch well for approximately 100 years, affecting private wells (including those wells that are currently awaiting approval by the State Engineer). **Figure 4.44-1** details the Proposed Action maximum water drawdown relative to the Mount Hope maximum water drawdown Cumulative impacts from the Proposed Action on groundwater quality or surface water quality are not expected.

4.45 Wetlands and Riparian Zones

4.45.1 CESA Boundary

The CESA for wetlands and riparian zones includes the Kobeh Valley Hydrographic Basin (#139) and the Diamond Valley Hydrographic Basin (#153), and extends six miles (10 kilometers) north of the Kobeh Valley Hydrographic Basin (**Figure 4.23-1**). The total area of the CESA encompasses approximately 1,120,249 acres. This CESA was selected because it is the anticipated extent of cumulative impacts to wetland and riparian zones.

4.45.2 Past and Present Disturbances

Past and present disturbance within the wetlands and riparian zones CESA includes the following: mineral exploration and development (4,181 acres); sand and gravel operations (3,400 acres),

utilities, infrastructure, and public purpose activities (4,779 acres); roads (4,438 acres); livestock grazing and agricultural cropping; limited urban development (36,856 acres); dispersed recreation; and wildland fires (13,765 acres).

Impacts from all past and present actions include potential increase of run-off into wetlands, degradation or loss of wetlands and riparian areas, groundwater drawdown from groundwater pumping, and potential reduced flows to streams in the area. Additionally, livestock and wildlife grazing can impact wetland and riparian areas through trampling and shearing of streambanks, compaction of wetland soils, trampling of plants, and overuse of riparian plant species. Riparian and wetland areas that have been overgrazed are susceptible to invasion by noxious weeds and non-native invasive species, which can displace riparian and wetland species over time.

4.45.3 Reasonably Foreseeable Future Disturbances

RFFAs within the wetlands and riparian zones CESA would include the following: mineral exploration and development (8,796 acres); sand and gravel operations (614 acres); utilities, infrastructure, and public purpose activities (90 acres); and a recreation facility [Perdiz Sport Shooting Range] (95 acres) (**Table 4.23-2**). Wildland fires in this CESA would also be expected to occur in the future, as would livestock grazing and dispersed recreation. These activities would lead to similar impacts as stated for past and present actions.

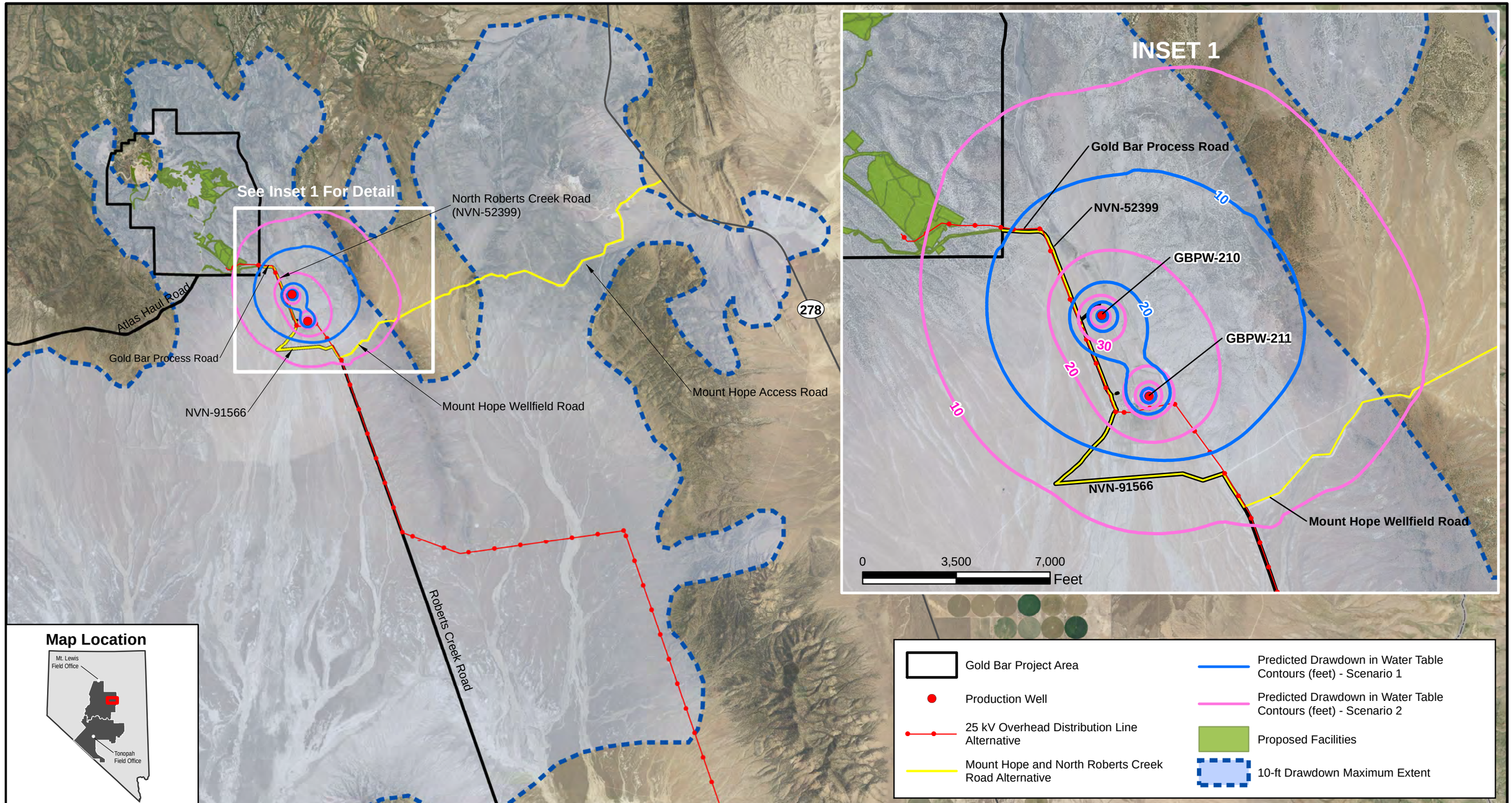
In addition, future restoration projects could also occur in this CESA. There are approximately 187,874 acres of proposed 3 Bars treatment areas in the wetlands and riparian zones CESA. The 3 Bars project could adversely affect nearby wetlands, floodplains, and riparian zones in the CESA, including through streambed and bank instability from vegetation removal and in-channel earthwork; increased runoff and sedimentation to surface waters and wetland/riparian areas affecting water quality; and potentially reducing water infiltration and groundwater recharge. However, treatments are typically used to help restore the functions of targeted wetlands and riparian zones causing a beneficial impact in the CESA (BLM, 2016f).

4.45.4 Cumulative Disturbances

Of the 1,120,249 acres covered by the wetlands and riparian zones CESA, approximately 77,014 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 78,143 acres, which is approximately seven percent of the CESA.

4.45.5 Cumulative Effects

The Proposed Action is not anticipated to result in direct impacts to wetland and riparian resources since there are none of these resources within the Plan boundary. There are no wetlands located within the 10-foot drawdown contour estimated for proposed groundwater pumping, and flow in Roberts Creek is not anticipated to be impacted by the Project. Since impacts on wetlands and riparian resources from the Proposed Action would not occur, or are negligible, there would be no cumulative impact from the Proposed Action, when combined with past, present, and RFFAs within the CESA.



Battle Mountain
BLM District
Mount Lewis Field Office

McEWEN MINING INC.
GOLD BAR EIS PROJECT

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1 in = 2 miles

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PROPOSED ACTION WATER DRAWDOWN RELATIVE TO THE MOUNT HOPE PROJECT

FIGURE 4.44-1

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

4.46 Wildlife (including Migratory Birds and Sensitive Wildlife Species)

4.46.1 CESA Boundary

The CESA boundary for wildlife includes four separate boundaries: 1) Pronghorn Antelope (**Figure 4.23-8**); 2) Mule Deer (**Figure 4.23-8**); 3) General Wildlife, Migratory Birds, and Raptors (**Figure 4.23-9**); and 4) Sensitive Wildlife Species (Greater Sage-Grouse) (**Figure 4.23-8**).

Pronghorn Antelope

The CESA for pronghorn antelope includes Management Units 141, 143, and 151-156. This CESA encompasses approximately 3,584,126 acres. This CESA boundary was chosen because these are the management units that pronghorn antelope are managed in, and the management units that pronghorn antelope are known to utilize within and surrounding the Project.

Mule Deer

The CESA for mule deer includes Management Units 141-145. This CESA encompasses approximately 1,927,453 acres. This CESA boundary was chosen because these are the management units that mule deer are managed in, and the management units that mule deer are known to utilize within and surrounding the Project.

General Wildlife, Migratory Birds, and Raptors

The CESA for general wildlife, migratory birds, and raptors includes the Kobeh Valley Hydrographic Basin (#139), the Pine Valley Hydrographic Basin (#53), a two-mile buffer (one mile on each side of center line) around the portion of the 25 kV Distribution Line Alternative that is outside of Hydrographic Basin #139, and a 10-mile buffer around the Plan area for migratory birds. The CESA includes all the Roberts Mountains within the Project area as well as the Kobeh Valley. This CESA encompasses approximately 1,217,559 acres. This CESA was chosen because it encompasses all the Proposed Action and action alternatives, including the areas where cumulative impacts are most likely to occur for these resources.

Sensitive Wildlife Species (Greater Sage-Grouse)

The CESA for greater sage-grouse includes the Diamond and Three Bar PMUs. The CESA encompasses approximately 1,631,044 acres. This CESA was chosen because these are the management units that greater sage-grouse are managed in, as well as the management units that greater sage-grouse utilize within and surrounding the Project area.

4.46.2 Past and Present Disturbances

Pronghorn Antelope

Past and present disturbance within the pronghorn antelope CESA includes the following: mineral exploration and development (53,257 acres); sand and gravel operations (8,567 acres); oil, gas, and geothermal development (376 acres); utilities, infrastructure, and public purpose activities (9,664 acres); roads and railroads (14,464 acres); livestock grazing and agricultural cropping;

limited urban development (5,593 acres); recreation facilities (797 acres); and wildland fires (236,229 acres).

Past and present disturbances from mineral development/exploration, oil, gas, and geothermal development, sand and gravel operations, utilities, infrastructure, and public purpose activities in the CESA have resulted in displacement of individuals and populations, loss and fragmentation of pronghorn antelope habitat, and potential reduction in quality of the habitat for forage.

Road construction and use, and railroads in the CESA have the potential to fragment pronghorn antelope habitat and may lead to increased mortalities within their habitats. In general, roads lead to increased direct mortality from vehicle collisions.

Pronghorn antelope may be affected by livestock grazing due to competition for forage, and habitat removal/conversion, and from agricultural cropping due to loss of habitat and forage area.

Urban development in the CESA often permanently removes habitat and may result in fragmentation and displacement. However, the limited amount of urban development within the CESA would likely have resulted in minor impacts to pronghorn antelope.

Past and present recreational uses in the CESA include hunting, fishing, ATV use, cycling, and camping, as well as designated recreation areas such as the Hickison Petroglyph Recreation Area, the Mill Creek Recreation Area, the Copper Basin Mountain Bike Trail, and the Shoshone Mountain Range OHV Trail System. Human disturbance during periods of the year when wildlife are otherwise stressed, due to a lack of forage and/or harsh weather (as occurs during the winter season), can further stress wildlife and may increase mortality. In general, human presence disturbs many species of wildlife throughout their habitats.

Wildland fires may have resulted in loss of forage area, establishment of invasive weeds, and displacement from loss of habitat for pronghorn antelope.

Mule Deer

Past and present disturbance within the mule deer CESA includes the following: mineral exploration and development (21,407 acres); sand and gravel operations (5,418); oil, gas, and geothermal development (seven acres); utilities, infrastructure, and public purpose activities (7,830 acres); roads and railroads (8,152 acres); livestock grazing and agricultural cropping; limited urban development (37,176 acres); and wildland fires (81,204 acres).

Impacts to mule deer from past and present actions are the same as the impacts described above for pronghorn antelope.

General Wildlife, Migratory Birds, and Raptors

Past and present disturbance within the general wildlife, migratory birds, and raptors CESA includes the following: mineral exploration and development (5,917 acres); sand and gravel operations (2,604 acres); utilities, infrastructure, and public purpose activities (5,161 acres); roads

(4,554 acres); livestock grazing and agricultural cropping; limited urban development (425 acres); recreation facilities (400 acres); and wildland fires (67,211 acres).

Past and present activities from mineral development and exploration activities, sand and gravel operations, and utility, infrastructure, and public purpose activities in the CESA have resulted in removal of vegetation, dispersal or displacement of local populations, and fragmentation of certain wildlife habitats and populations. Removal of vegetation understory may impact nesting success and predation. Power lines have potentially increased areas for predator perching, which may have impacts on prey species.

Road construction and use disturbs wildlife habitat by removing vegetation, compacting soils, displacing individuals, and long-term impacts resulting from habitat fragmentation and direct mortality from vehicle collisions.

Other activities such as grazing and agriculture cropping, which are not quantified in **Table 4.23-2,** also have potential consequences to wildlife. Wildlife is affected by livestock grazing due to competition for forage, trampling of smaller species by larger grazing animals, and habitat removal/conversion. Reduction to grass understory can also impact nesting success, increase predation, and affect wildland fire regimes. Proper rotation and stocking rates can minimize these impacts to wildlife. Agricultural cropping has impacts to wildlife by removing available habitat, increasing predation, and fragmenting populations.

Urban development often permanently removes wildlife habitat, displaces individuals and populations, and fragments habitat. However, the limited amount of urban development within the CESA would likely have resulted in minor impacts.

Human presence tends to disturb many species of wildlife throughout their habitats. Past and present recreational uses in the area include hunting, fishing, all-terrain vehicle (ATV) use, cycling, and camping. Human disturbance during periods of the year when wildlife are otherwise stressed, due to a lack of forage and/or harsh weather (as occurs during the winter season), can further stress wildlife and may increase mortality.

Wildland fires may have resulted in loss of forage area, establishment of invasive weeds, and displacement from loss of habitat for wildlife species.

Sensitive Wildlife Species (Greater Sage-Grouse)

Past and present disturbance within the sensitive wildlife species (greater sage-grouse) CESA includes the following: mineral exploration and development (8,047 acres); sand and gravel operations (5,278), oil, gas, and geothermal development (nine acres); utilities, infrastructure, and public purpose activities (6,489 acres); roads (6,861 acres); livestock grazing and agricultural cropping; limited urban development (36,856 acres); dispersed recreation; and wildland fires (30,668 acres).

Past and present disturbances from mineral development/exploration, sand and gravel operations, oil, gas, and geothermal development activities in the CESA may have resulted in fragmentation and displacement of greater sage-grouse populations and fragmentation of their habitats. Direct mortalities and further habitat fragmentation from roads associated with these activities may have also occurred.

Greater sage-grouse are thought to leave suitable habitat where anthropogenic noise is chronic and more so if it is intermittent (Blickley et al., 2012). Sounds are essential to greater sage-grouse courtship displays, and leks in particular are susceptible to impacts from noise since they are locales that are used annually over decades and are central to the bird's reproduction. Effects from past and present mineral development/exploration, sand and gravel operations, oil, gas, and geothermal development activities likely have resulted in increased ambient noise levels, which may disturb greater sage-grouse breeding, nesting, and brood rearing behavior.

Past and present disturbances from utilities, infrastructure, and public purpose activities in the CESA have resulted in disruption of greater sage-grouse populations and their habitats. In addition, past and present construction of power lines have potentially increased areas for predator perching which may have impacts on prey species such as greater sage-grouse.

Road construction and use in the CESA tends to fragment habitat and leads to increased mortalities for greater sage-grouse. Mortalities may be direct from vehicle collisions or indirect from habitat fragmentation effects or other repercussions such as increased ambient noise levels, which may lead to habitat avoidance.

Greater sage-grouse can be affected by livestock grazing due to competition for forage, water, and habitat removal/conversion. Proper rotation and stocking rates can minimize impacts to wildlife.

Although development of urban areas has resulted in removal of vegetation and loss of potential habitat and forage for greater sage-grouse, the limited area of urban development within the CESA is likely have had minor effects to greater sage-grouse.

Wildland fire destroys greater sage-grouse habitat and potentially leads to conversion from sagebrush dominant vegetation cover types to invasive annual grassland monocultures, which have little or no value to the species. Wildfire fragments greater sage-grouse habitats and leads to increased direct and indirect mortalities of greater sage-grouse within their habitats. Reseeding and reclamation activities after wildland fires occur may have positive results on greater sage-grouse habitats although the effects from these activities are often not realized for many years until desirable plants have had an opportunity to become established.

As stated for wildlife, migratory birds, and raptors above, human presence from dispersed recreation tends to disturb many species of wildlife, including greater sage-grouse, throughout their habitats.

4.46.3 Reasonably Foreseeable Future Disturbances

Pronghorn Antelope

RFFAs within the pronghorn antelope CESA would include the following: mineral exploration and development (21,946 acres); sand and gravel operations (283 acres); utilities, infrastructure, and public purpose sites (74 acres); oil, gas, and geothermal development (640 acres); and a proposed road (169 acres) (**Table 4.23-2**). These activities would lead to similar impacts as stated for past and present actions. In addition, future restoration projects could also occur in this CESA. There are approximately 199,010 acres of proposed 3 Bars treatment areas in the pronghorn antelope CESA, which may include impacts such as vehicle related mortalities, increased noise, loss of habitat, displacement, and fragmentation. However, restoration projects may improve the habitat quality, improve seasonal movements, as well as enhance water quality and quantity in the CESA (BLM, 2016f).

Mule Deer

RFFAs within the mule deer CESA would include the following: mineral exploration and development (9,533 acres); sand and gravel operations (1,029 acres); utilities, infrastructure, and public purpose sites (245 acres); and the proposed Perdiz Sport Shooting Range (95 acres) (**Table 4.23-2**). In addition, future restoration projects could also occur in this CESA. There are approximately 224,730 acres of proposed 3 Bars treatment areas in the mule deer CESA, which may include impacts such as vehicle related mortalities, increased noise, loss of habitat, displacement, and fragmentation. However, restoration projects may improve the habitat quality, improve seasonal movements, as well as enhance water quality and quantity in the CESA (BLM, 2016f). These activities would lead to similar impacts as stated for past and present actions.

General Wildlife, Migratory Birds, and Raptors

RFFAs within the general wildlife, migratory birds, and raptors CESA would include the following: mineral exploration and development (8,760 acres); sand and gravel operations (433 acres); and utilities, infrastructure, and public purpose sites (two acres) (**Table 4.23-2**). In addition, future restoration projects could also occur in this CESA. There are approximately 216,645 acres of proposed 3 Bars treatment areas in the general wildlife, migratory birds, and raptors CESA, which may include impacts such as vehicle related mortalities, increased noise, loss of habitat, displacement, and fragmentation. However, restoration projects may improve the habitat quality, improve seasonal movements, as well as enhance water quality and quantity in the CESA (BLM, 2016f). These activities would lead to similar impacts as stated for past and present actions.

Sensitive Wildlife Species (Greater Sage-Grouse)

RFFAs within the sensitive wildlife species (greater sage-grouse) CESA would include the following: mineral exploration and development (11,757 acres); sand and gravel operations (671 acres); utilities, infrastructure, and public purpose sites (246 acres); and the Perdiz Sport Shooting Range (95 acres) (**Table 4.23-2**). In addition, future restoration projects could also occur in this CESA. There are approximately 282,320 acres of proposed 3 Bars treatment areas in the greater

sage-grouse CESA, which may include impacts such as vehicle related mortalities, increased noise, loss of habitat, displacement, and fragmentation. However, restoration projects may improve the habitat quality, improve seasonal movements, as well as enhance water quality and quantity in the CESA (BLM, 2016f). These activities would lead to similar impacts as stated for past and present actions.

4.46.4 Cumulative Disturbances

Pronghorn Antelope

Of the 3,584,126 acres covered by the pronghorn antelope CESA, approximately 352,059 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately 10 percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 353,188 acres, which is approximately 10 percent of the CESA.

Mule Deer

Of the 1,927,453 acres covered by the mule deer CESA, approximately 172,096 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately nine percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 173,225 acres, which is approximately nine percent of the CESA.

General Wildlife, Migratory Birds, and Raptors

Of the 1,217,559 acres covered by the general wildlife, migratory birds, and raptors CESA, approximately 95,467 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately eight percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 96,596 acres, which is approximately eight percent of the CESA.

Sensitive Wildlife Species (Greater Sage-Grouse)

Of the 1,631,044 acres covered by the sensitive wildlife species (greater sage-grouse) CESA, approximately 106,977 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately seven percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 108,106 acres, which is approximately seven percent of the CESA.

4.46.5 Cumulative Effects

Pronghorn Antelope

Impacts from past, present, and RFFAs in combination with the Proposed Action would result in cumulative displacement and habitat fragmentation, as well as short-term to long-term disturbance and removal of habitat and forage area. Displacement and habitat fragmentation decreases survival rates of affected individuals to some degree and increases competition. The additional presence of roads may increase mortality from vehicle collisions. If disturbance areas are not reclaimed properly, invasive weeds may establish which would impact the available forage area and habitat for pronghorn antelope.

The Proposed Action may increase vehicle related mortalities as a result of Project access roads. However, the Proposed Action is located outside of pronghorn distribution, and migration corridors would likely not be impacted. As a result, the Proposed Action, in combination with past, present, and RFFAs, would result in negligible cumulative effects to pronghorn antelope.

Mule Deer

Impacts from past, present, and RFFAs in combination with the Proposed Action would result in the same cumulative impact as pronghorn antelope.

The Proposed Action would fragment seasonal mule deer habitat, and would result in the loss of crucial summer habitat. In addition, the Proposed Action may include increased vehicle related mortality from the access roads, and would increase the human presence within the CESA. Reclamation would occur to facilitate habitat recovery, but habitat type would change from woodland to grassland and sagebrush steppe habitat, which may have long-term impacts on mule deer habitat. The Proposed Action, in combination with past, present, and RFFAs, would result in minor cumulative effects to mule deer and mule deer migration within the CESA.

General Wildlife, Migratory Birds, and Raptors

Cumulative impacts on general wildlife from past, present, and RFFAs in combination with the Proposed Action would result in cumulative displacement and habitat fragmentation, as well as short-term to long-term disturbance and removal of habitat and forage area. Wildlife displacement and habitat fragmentation decreases survival rates of affected individuals to some degree and increases competition. The additional presence of roads may increase mortality from vehicle collisions. If disturbance areas are not properly reclaimed, invasive weeds may establish which would have additional long-term impacts on wildlife habitat.

Land clearing activities associated with the Proposed Action would disturb several types of wildlife habitat, which may result in mortality from trampling or crushing, habitat removal, habitat fragmentation and displacement. The Proposed Action would also increase noise levels due to heavy equipment operation, and would increase vehicular and human presence along roads and land clearing areas. Project EPMs would help reduce cumulative impacts to general wildlife resulting from the Proposed Action. The Proposed Action, in combination with past, present, and RFFAs, would result in negligible to minor cumulative impacts to wildlife, migratory birds, and raptors within the CESA.

Sensitive Wildlife Species (Greater Sage-Grouse)

Impacts from past, present, and RFFAs in combination with the Proposed Action would result in cumulative displacement and habitat fragmentation, as well as short-term to long-term disturbance and removal of habitat and forage area. Displacement and habitat fragmentation decreases survival rates (decreased breeding, nesting, and brood survival) of affected individuals. Cumulative impacts would result from increased ambient noise levels and direct mortalities associated with collisions with vehicles, fences, and transmission lines.

The Proposed Action would result in direct impacts by habitat removal and fragmentation and increased noise during construction and mining operations. Cumulative vehicle traffic may result in increased mortality due to collisions, and may result in the possibility that leks would be abandoned; however, seasonal timing restriction associated with the Proposed Action reduces the potential for lek abandonment. Direct impacts from disturbance associated with the Proposed Action as well as indirect impacts would be offset through the use of the state of Nevada's CCS, or a proponent driven mitigation plan. The Proposed Action, in combination with past, present, and RFFAs, would result in minor cumulative impacts to greater sage-grouse within the CESA, as a result of increased noise, habitat removal, and fragmentation.

4.47 Wild Horses and Burros

4.47.1 CESA Boundary

The CESA for wild horses and burros includes the Roberts Mountain, Whistler Mountain, and portions of the Fish Creek HMAs, as well as portions of the Kobeh Valley and Roberts Mountain HAs where wild horses exist based on past inventories, and where they could be potentially affected by the Project. The boundary also includes a 1,000-foot buffer of the 25 kV Distribution Line Alternative. (**Figure 4.23-11**). The total area of the CESA encompasses approximately 284,008 acres.

4.47.2 Past and Present Disturbances

Past and present disturbance within the wild horse and burro CESA includes the following: mineral exploration and development (1,944 acres); sand and gravel operations (1,242); utilities, infrastructure, and public purpose activities (2,850 acres); roads (884 acres); livestock grazing and agricultural land; dispersed recreation; and wildland fires (8,215 acres). Past activities that have affected wild horses also include wild horse gathers and removal operations in the Roberts Mountain and Fish Creek HMAs and Roberts Mountain and Kobeh Valley HAs. Gathers and removal of excess wild horses reduces the population size and changes, at least temporarily, use and distribution patterns, and can impact genetic variability. Four gather operations have been completed within the Roberts Mountain HMA, which have included the Roberts Mountain HAs. Numerous gathers of the Fish Creek HMA have been completed, with population growth suppression (fertility control) administered to mares released to the range in 1998 and 2015 (**Tables 4.47-1** and **4.47-2**).

Table 4.47-1 Roberts Mountain HMA Gather History

Year	Total Capture	Released Back to HMA	Removed from HMA
1987	120	0	120
1995	344	108	236
2001	580	131	449
2008	373	25	348

Table 4.47-2 Fish Creek HMA Gather History

HMA	Year	Total Capture	Released Back to HMA	Removed from HMA
Fish Creek	1980	413	0	413
	1986	99	0	99
	1987	303	0	303
	1994	889	246	643
	1998	622	144	478
	2000	600	0	600
	2004	55	0	55
	2005	200	34	165
	2006	131	17	114
	2015	424	162	262

In 2001, 28 water stressed wild horses were removed from the Whistler Mountain HMA and Kobeh Valley in conjunction with the Roberts Mountain HMA gather.

The Kobeh Valley area, outside of the Fish Creek HMA boundaries was gathered in 1994, and included the capture of 129 wild horses and release of 27 wild horses over the age of 10 years old back to the area.

The 2008 gather of Roberts Mountain also included the gather and removal of approximately 40 horses from Kobeh Valley HA which are included in the figures in the table above.

Mineral exploration and development, and sand and gravel operations remove vegetation from lands that may be used as cover and forage area for wild horses and burros. Surface disturbance can fragment areas of wild horse use. In addition, surface disturbance and vegetation clearing increases the likelihood of spreading noxious weeds and non-native invasive species, which may further reduce available forage area. Noise and increased human activity from these operations may displace herds to adjacent areas.

Impacts to wild horses and burros from utilities, infrastructure and public purpose activities is generally limited to the initial construction of the utilities and infrastructure. These impacts include vegetation removal which may reduce some forage area, and the potential spread of noxious weeds and non-native invasive species. During construction, the noise and increased human activity may displace herds to adjacent areas. However, after construction is completed, and once revegetation occurs on disturbed areas, impacts from utilities would be reduced substantially.

Impacts from roads on wild horses and burros includes the potential for increase vehicle related mortalities, and potential displacement from increased human presence. In addition, vegetation is cleared for the roads, which decreases forage area to a minor extent. Vehicles traveling on the roads may also spread noxious weeds and non-native invasive species, which would affect wild horse forage area.

Agricultural land occurs at the southern end of the CESA boundary, south of US 50. Agricultural land reduces and fragments forage area for wild horses. Livestock grazing impacts wild horses primarily due to competition for forage.

4.47.3 Reasonably Foreseeable Future Disturbances

RFFAs within the wild horse and burro CESA would include mineral exploration and development (8,753 acres) (**Table 4.23-2**). Dispersed recreation and livestock grazing are anticipated to continue into the future. In addition, future restoration projects could also occur in this CESA. There are approximately 113,989 acres of proposed 3 Bars treatment areas in the wild horse and burro CESA. Restoration activities could have short-term effects on wild horses by exposing them to treatments that could harm their health, interfere with their movements, cause changes in vegetation that could alter the carrying capacity of the HMAs, or limit their access to water, which could ultimately affect their genetic health. Long-term, vegetation management activities would improve the amount and quality of forage, and potentially increasing the carrying capacity of the HMAs (BLM, 2016f). These activities would lead to similar impacts as stated for past and present actions. Completion of gather operations to reduce population size, achieve the AML, remove excess wild horses from outside the HMA, and implement population growth suppression (fertility control) can be expected to occur. It is estimated that at least two to four gather operations could be completed within the project area within the next 10 years.

The Three Bars Landscape Restoration Project implementation would include vegetation enhancement projects and fuels reduction throughout the Roberts Mountain Complex which would improve habitat for wild horses and reduce risk of wildfire.

When the Mount Hope Mine initiates construction and mining operations, approximately 14,204 acres would be fenced of the Roberts Mountain and Whistler HMAs (BLM, 2012a), which will have long term, major effects to wild horses in the vicinity of the Mount Hope project through displacement and loss of habitat. Changes in distribution and use of the HMA would be expected and would be cumulative to those effects that occur due to the Project activity.

4.47.4 Cumulative Disturbances

Of the 284,008 acres covered by the wild horse and burro CESA, approximately 23,888 acres of disturbance are associated with past, present, and RFFAs, which is a disturbance of approximately eight percent of the CESA. The Proposed Action would increase the disturbance within the CESA by 1,129 acres to 25,017 acres, which is approximately nine percent of the CESA.

4.47.5 Cumulative Effects

Impacts from past, present, and RFFAs in combination with the Proposed Action would result in cumulative loss or fragmentation of wild horse forage area, potential increase in vehicle related mortalities, and displacement of wild horses to adjacent areas.

The Proposed Action would result in the loss of some potential wild horse forage area and may displace wild horses to other areas during operations. The Proposed Action, in combination with past, present, and RFFAs, could result in moderate to major cumulative impacts to wild horses, primarily from localized habitat fragmentation,, reduction in forage area, loss of habitat, and displacement of wild horses to adjacent areas. Some of this impact may be offset by habitat improvement projects, and improved range condition due to maintaining the wild horse population at AML and potential changes to livestock management systems.

4.48 Cumulative Effects Analysis for the 25 kV Overhead Distribution Line Alternative

Overall effects to air quality, cultural resources, historic trails, environmental justice, forest products, geology and minerals, grazing management, hazardous or solid waste, land use and transportation, Native American cultural concerns, noise, paleontological resources, recreation, social and economic values, soils, vegetation, visual resources, water resources, wetlands and riparian areas, wildlife, and wild horses would be similar to the Proposed Action; therefore, cumulative effects are expected to be the same as described for the Proposed Action relating to mining activities.

However, additional disturbance would occur with the construction of the distribution line, which would have additional impacts on numerous resources. These additional impacts would include:

- Additional vegetation removal, which may result in an increased potential to spread noxious weeds and non-native and invasive species would also increase;
- Additional loss of habitat and forage area for wildlife and wild horses (including an additional loss of greater sage-grouse GHMA and PHMA habitat);
- Additional wildlife and wild horse displacement due to increased human presence and increased noise during construction of the distribution line;
- Additional potential fragmentation for wildlife and wild horse habitat;
- Additional area for predator perching on power lines which may have impacts on prey species such as greater sage-grouse; however, anti-perching devices would be used within four miles of active or pending greater sage-grouse leks, which would reduce impacts to prey species;
- Increased potential for bird electrocutions and collisions associated with the power line;
- Increased vehicle related mortalities, or mortality through trampling or crushing with heavy machinery;
- The distribution line would result in a moderate to high degree of visual contrast, which would result in additional visual impacts to the form, line, color, and texture of the existing landscape;

- The distribution line would result in additional visual impacts to the setting of the Pony Express Trail;
- Additional soil disturbance would occur which may increase wind or water based erosion, and may result in increased degradation of soil function;
- Additional impacts to recreation and land use would occur because some recreationists may be displaced during construction; however, this would be a temporary impact, likely only occurring during construction;
- Additional impacts would occur to land use within the 40-foot permanent ROW for as long as the distribution line would be operational;
- Additional potential loss of forage area for livestock, as well as a further potential of reduction of AUMs;
- Additional loss of forest products;
- Additional loss of access to bedrock lithologies underlying the distribution facilities; and
- The construction of the power line may generate additional wages and salaries impacting the social and economic setting of Eureka County.

This alternative would add approximately 130 acres of disturbance to CESAs that are many thousands of acres. Therefore, cumulative impacts from past, present, and RFFAs when combined with this alternative would be minor.

4.49 Cumulative Effects Analysis for the Three Bars Road/Atlas Haul Road as Only Access Alternative

Overall effects to air quality, cultural resources, historic trails, environmental justice, forest products, geology and minerals, grazing management, hazardous or solid waste, land use and transportation, Native American cultural concerns, noise, paleontological resources, recreation, social and economic values, soils, vegetation, visual resources, water resources, wetlands and riparian areas, wildlife, and wild horses would be similar to the Proposed Action; therefore, cumulative effects are expected to be the same as described for the Proposed Action. There would be a reduction of vehicle traffic on Roberts Creek Road as compared to the Proposed Action, which may reduce the spread of noxious weeds and non-native and invasive species, may reduce noise impacts to wildlife and wild horses, and may reduce vehicle related mortality to wildlife and wild horses on Roberts Creek Road. However, as vehicle traffic on Roberts Creek Road associated with the Proposed Action is relatively low, and noise impacts are anticipated to be negligible to wildlife (including greater sage-grouse) and wild horses, this alternative does not result in a noticeable change in cumulative impacts from the Proposed Action. Cumulative impacts from past, present, and RFFAs when combined with this alternative are expected to remain minor.

4.50 Cumulative Effects Analysis for the Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative

Overall effects to air quality, cultural resources, historic trails, environmental justice, forest products, geology and minerals, grazing management, hazardous or solid waste, land use and transportation, Native American cultural concerns, noise, paleontological resources, recreation, social and economic values, soils, vegetation, visual resources, water resources, wetlands and riparian areas, wildlife, and wild horses would be similar to the Proposed Action; therefore, cumulative effects are expected to be the same as described for the Proposed Action in relation to mining activities. There would be a reduction of vehicle traffic on Roberts Creek Road as compared to the Proposed Action, which may reduce the spread of noxious weeds and non-native invasive species in that area, may reduce noise impacts to wildlife and wild horses along Roberts Creek Road (which is anticipated to be negligible under the Proposed Action), and may reduce vehicle related mortality to wildlife and wild horses on Roberts Creek Road.

However, light vehicle traffic would utilize the Mount Hope access road and wellfield road instead of Roberts Creek Road. This would generate the following additional impacts:

- Additional vehicular traffic on State Route 278 and the Mount Hope access road and wellfield road;
- Additional noise generation on the Mount Hope access road and wellfield road;
- The potential spread of noxious weeds and non-native invasive species along the Mount Hope access road and wellfield road;
- Vehicle related mortality to wildlife, livestock and wild horses on the Mount Hope access road and wellfield road; and
- Potential displacement of wildlife, livestock, and wild horses due to increased human presence and noise levels.

The Mount Hope Project is currently not operating. However, it is anticipated to start up in the reasonably foreseeable future. The Mount Hope Project, when operational, is expected to substantially increase traffic on State Route 278 during construction. Mount Hope construction related traffic is estimated to be 3,600 round-trips (trucks and commuting labor) from Eureka and Diamond Valley (BLM, 2012a). During operations, the traffic generation from Mount Hope is expected to reduce greatly, with an estimated 26 daily truck trips and 216 daily non-truck (commuting labor) trips consisting of 100 cars, six vans, and two buses for each shift (two shifts would occur). This would be a total of 242 trips per day along State Route 278. This alternative is expected to result in an additional 40 light vehicles per day above what would occur under the Proposed Action (approximately 10 heavy vehicle trips per day are expected on State Route 278 under the Proposed Action). This would result in a moderate to major cumulative impact to traffic generation if it occurs at the same time as construction of the Mount Hope Project. If the Mount Hope Project were not constructed during the operational life of this alternative, impacts to traffic generation would be minor.

In addition, the Henderson Pass lek is within 600 feet of the Mount Hope wellfield road. The cumulative impact from the Mount Hope Project mining operations when combined with this alternative, would result in major cumulative impacts to the Henderson Pass lek, resulting in the loss of this lek. This loss of the lek would likely occur even if the Mount Hope Project were not constructed during the operational life of this alternative.

Cumulative impacts from past, present, and RFFAs when combined with this alternative are expected to be moderate to major.

4.51 Cumulative Effects Analysis for the No Action Alternative

Under this alternative, the Project would not occur. Up to 16 acres of surface disturbance would continue within the Project area under authorized Notice-level activities, which would continue to result in cumulative impacts including: vegetation removal; noise generation; potential erosion and storm water runoff; displacement of wildlife, wild horses, livestock, and recreation users to adjacent areas; and visual impacts to the existing landscape. The Proposed Action would reclaim approximately 395 acres of the 654 acres of existing disturbance from the Atlas mining operations. However, since the Proposed Action would not occur, no reclamation would occur on this existing disturbance, so it would remain a cumulative impact to several resources including vegetation, visual, wildlife, grazing management, wild horses, lands and realty, recreation, soils and potentially water resources from erosion and sedimentation.

Cumulative impacts from past, present, and RFFAs when combined with this alternative are expected to be minor.

4.52 Mitigation

Where potential impacts to a resource are identified, potential mitigation measures are evaluated in this document. Mitigation measures are means to address environmental impacts that are applied in the impact analysis to reduce intensity of or eliminate the impacts. To be adequate and effective, CEQ rules (40 CFR 1508.20) require that mitigation measures fit into one of five categories:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
- Compensating for the impact by replacing or providing substitute resources or environments.

Mitigation measures, as determined applicable, are identified in this section by resource.

4.52.1 Greater Sage Grouse

Two compensatory mitigation options were reviewed to mitigate residual impacts to greater sage-grouse. This includes the use of the State of Nevada CCS as well as a Proponent Driven Mitigation Plan. Both methods are outlined below and in both cases would be applied to all alternatives.

The proposed project is a non-discretionary 43 CFR 3809 action, with discretion limited to preventing unnecessary and undue degradation to a resource. With the implementation of the applicant committed EPMs (Sections 2.2.23 and 2.3.27), as well as the Design Features and Management Decisions from the 2015 Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment (**Appendix A**), the direct and indirect impacts to greater sage-grouse were determined to be long-term and minor; therefore, additional mitigation was determined necessary to prevent undue degradation to the resource.

Mitigation Option 1 - Nevada Conservation Credit System

Under this mitigation option, if selected, direct impacts from disturbance associated with the Proposed Action and other action Alternatives as well as indirect impacts to greater sage-grouse would be offset using the State of Nevada's CCS. The use of the CCS would be in cooperation with the SETT, as outlined in the Memorandum of Understanding between the U.S. Department of the Interior, BLM Nevada State Office and California State Office, Nevada Department of Conservation and Natural Resources, and the USDA, Forest Service, Humboldt-Toiyabe National Forest.

The CCS quantifies benefits from preservation and enhancement of habitat and negative impacts to habitat from anthropogenic disturbances. The CCS measures habitat value in units of functional acres. The CCS' Habitat Quantification Tool (HQT) calculates debit obligation values based on the change in functional acres from the direct and indirect impacts from a project.

The HQT determines the number of credits necessary to off-set the impacts of a project and achieve a net conservation gain for greater sage-grouse. Within the CCS, credits and debits are evaluated using the same methods. Credits are purchased through an open market to meet the debit obligation of a project. To ensure net conservation gain, the CCS sets aside credits within a reserve account, which assures that there are enough credits in place should credits be invalidated due to force majeure (i.e., wildfire, drought, flood, etc.) or other factors. The conservative approach of the CCS, combined with the reserve account, ensures that a net conservation gain for sage-grouse impacts is realized for the Project.

MMI conducted the HQT to determine the potential debit obligation from the Proposed Action within the CCS. After review, BLM determined this option to not be a viable approach since there are currently no credits available for purchase within the CCS and MMI does not own private property where credits could be generated to off-set the debit obligation.

Mitigation Option 2 - Proponent Driven Mitigation Plan

MMI developed a proponent driven mitigation plan for impacts to greater sage-grouse habitat from the Project. A brief description of the plan follows, but the full plan is provided as **Appendix F**. This mitigation plan would be applied to any alternative selected.

To mitigate impacts to greater sage-grouse, MMI is proposing to conduct vegetation treatments analyzed in the 3 Bars Ecosystem and Landscape Restoration Project, FEIS (BLM, 2016f). MMI would contract with a third-party contractor to conduct treatments in one or more areas analyzed in the 3 Bars Ecosystem FEIS . MMI is proposing a 4:1 mitigation ratio for PHMA, 3:1 mitigation ratio for GHMA, and 2:1 mitigation ratio for OHMA. The mitigation of OHMA and GHMA acres could occur in areas mapped as GHMA or PHMA. Net conservation gain would be demonstrated using quantification of ecological attributes within the treatment areas and demonstrate an uplift of 10 percent over baseline conditions.

Table 4.52-1 Acres Mitigated for Greater Sage-grouse Habitat Disturbance Under the Proponent Driven Mitigation Plan

December 2015 SEP Habitat Category Mapping	Acres			
	Project/Proposed Action[1]	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative
PHMA (4:1)	768	224	0	0
GHMA (3:1)	1,626	99	0	0
OHMA (2:1)	0	26	0	0

Due to uncertainties described above with the Nevada CCS program, the preferred greater sage-grouse mitigation option is Mitigation Option 2 (Greater Sage-Grouse Proponent Driven Mitigation Plan). This proponent driven plan is preferred because the mitigation can be implemented upon signing of the ROD, whereas the timeframe of credits available for purchase in the CCS is currently unknown.

CHAPTER 5
CONSULTATION AND COORDINATION

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CHAPTER 5 CONSULTATION AND COORDINATION

This chapter describes specific actions taken by the BLM MLFO to consult and coordinate with Native American Tribes, government agencies, and interested groups, and to involve the interested general public during preparation of this EIS.

A NOI was published in the Federal Register on September 11, 2015, formally announcing the intent to prepare an EIS for the Gold Bar Mine Project. Publication of the NOI initiated the scoping process and invited participation of affected and interested agencies, organizations, and the public in helping the BLM determine the scope and issues to be addressed in the EIS.

Public involvement is an important part of the environmental analysis under the NEPA process. Federal agencies are required to make “diligent efforts” to involve the public early and often in preparing and implementing their NEPA procedures; to inform the public by providing public notice of NEPA-related hearings, public meetings, and availability of documents; and to solicit appropriate information from the public (40 CFR 1506.6).

The goal of the public involvement process is to foster public understanding of the project and allow participation in the analysis and decision-making process regarding the proposed Gold Bar Mine Project EIS.

5.1 Cooperating Agencies and Consultation

Cooperating agencies were invited to participate in the NEPA process including: review of analyses, contribution of technical expertise, and assisting in the response to public comments as required by their jurisdiction or regulatory authority. MOAs were developed between the cooperating agencies and the BLM. The purpose of the MOA is to:

- Confirm the formal designation of the BLM as lead agency in the EIS process with the responsibility for the conclusions of the DEIS and FEIS;
- Formally designate cooperating agencies in the EIS planning process;
- Formalize and provide a framework for cooperation and coordination between the BLM and a cooperating agency that is necessary in order to successfully complete the EIS in a timely, efficient, and thorough manner;
- Describe the respective roles, responsibilities and expertise of each entity in the planning process; and
- Ensure that the working relationship between the BLM and cooperating agency meets the purposes and intent of NEPA.

As part of the federal review process in response to MMI proposed Gold Bar Mine Project, the BLM sent letters to the agencies and cities below inviting their participation as cooperating agencies for the NEPA process and EIS documentation. Cooperating agencies include:

- Eureka County Board of Commissioners;
- NDOW;
- NPS; and
- USFWS

Eureka County is an official cooperating agency for preparation and review of the EIS, as outlined in the MOU (BLM-NV-MOU-LLNVB01000-2016-004). The BLM and the EPA have an agency-wide MOU for coordination on NEPA projects, and the EPA has actively coordinated with the BLM on this EIS. Although not under an MOU, the NDOW, the USFWS, and the NPS have also actively coordinated with the BLM on the preparation of this EIS.

Consultation with Native American tribes is an ongoing process throughout document preparation.

5.2 Scoping Process

Notice of Intent

The publication of the NOI initiated a formal 30-day scoping period and announced the locations and dates of the public scoping meetings.

Press Releases

A BLM press release was posted to the BLM State of Nevada website (www.blm.gov/nv/st/en.html) and the Battle Mountain District website (www.blm.gov/nv/st/en/fo/battle_mountain_field.html).

Project Website

A website for the project was launched concurrently with publication of the NOI under BLM Projects on the BLM Battle Mountain webpage.

Scoping Letter

A scoping letter was prepared and sent to 63 people, agencies, and groups on September 15, 2015. The letter provided information regarding participating in the public involvement process and attending the public scoping meetings was sent out that included a summary of the proposed Project as well as a description of how, when, and where to send comments. The mailing list of potentially interested parties was compiled by the BLM from those known or likely to be interested in the Project and previous NEPA project mailing lists.

Scoping Meetings

One public scoping meeting was held at the Eureka County Commissioners' Meeting Room, 10 South Main Street, Eureka, Nevada 89316 on October 6, 2015 from 6:00 PM to 8:00 PM.

The meeting was held in open house format. The attendees were provided handouts describing the Project and defining the purpose and need, a map showing the project, and the scoping comment form.

All attendees were asked to sign in and provide their contact information. Representatives from the BLM, MMI, and Stantec were present at the meeting to answer questions, discuss the project, and accept public comments. Attendees at the scoping meeting were provided with handouts describing the project as well as the NEPA process. Comment forms were also provided to all attendees to facilitate submission of written scoping comments. The public was given the option to provide comments during the meeting, using regular mail, fax, or e-mail. In addition, information regarding the project and the NEPA process was posted on the BLM's project website.

Scoping Response

The 30-day scoping period for the Gold Bar Mine Project, during which comments were received, was from September 11 through October 21, 2015. All responses received by BLM were logged, analyzed, and summarized to discern issues of concern. A total of 12 letters, emails, and faxes were received in response to the request for public comment regarding the project. Copies of all letters, comment forms, faxes, and e-mails received are available in the Gold Bar Mine Scoping Report (Stantec, 2015b).

Comments received in response to solicitations, including names and addresses of those who commented, are considered part of the public record on this EIS and are available for public inspection at the BLM Battle Mountain District Office.

5.3 EIS Mailing List

An EIS mailing list of interested persons was initially assembled from the scoping mailing list with the addition of persons who expressed interest in being added to the mailing list during and subsequent to scoping. The mailing list for the project was revised to add those persons who provided comments in response to scoping, requested to be on the mailing list, or signed a scoping meeting attendance list. Respondents that provided more than one comment letter were listed only once in the mailing list.

5.4 EIS Notification and Distribution

The Gold Bar Mine DEIS review period will open on publication of the Notice of Availability (NOA) for the DEIS in the Federal Register. This will begin a 45-day comment period. The BLM will also announce the availability of the DEIS by publishing notices of availability in local newspapers, on the project website, and through mailing. The notices will specify dates for the comment period and identify public meeting locations and dates. The DEIS will be widely distributed to interested parties identified in the updated mailing list, as described above, and also made available via the Internet.

5.5 Next Steps in the Planning Process

Comments received on the DEIS will be evaluated and modifications to the EIS will be made as needed. A second NOA will be published in the Federal Register to notify the public of the availability of the FEIS. A 30-day public availability period will follow, and a copy of the document will be filed with the EPA.

5.6 List of Preparers and Reviewers

Table 5.6-1 List of Preparers and Technical Specialists

BLM Battle Mountain District Office	
Field Manager	Jon Sherve
Assistant Field Manager – Renewable Resources	Joe Moskiewicz
Assistant Field Manager – Non-Renewable Resources	John G. Massey
Project Manager/Environmental Coordinator	Christine Gabriel
Cultural Resources, Paleontology	Steven Highland
Native American Consultation	Juan Martinez
Lands and Realty	Russell Webb Jon Kramer
Recreation/VRM, Wilderness/WSA, Wilderness Characteristics Inventory/Lands with Wilderness Characteristics	Paul Amar
Minerals	Joe Moskiewicz
Mining Engineer	David Djikine John Ames
Hazmat	Rick Singer
Fire Management, Forestry	Vaughn Cork
Range, Vegetation, Soils	Amanda Holmes
Noxious Weeds, Invasive, Non-native Species	Anna O'Brien
Air Quality	Craig Nicholls
Hydrology (Groundwater)	Jim Harris
Hydrology (Surface Water)	Justin Ferris
Floodplains/Wetlands/Riparian	Justin Ferris
Fish Habitat, Wildlife, Migratory Birds, Threatened and Endangered Species (Flora and Fauna)	Dave Davis
Wild Horse and Burros	Shawna Richardson
Environmental Justice/Socioeconomics	Julie Suhr Pierce
Public Outreach	Kyle Hendrix Christine Gabriel
NEPA Technician	Maggie Corbari
Graphics/GIS	Kathy Graham
McEwen Mining Inc.	
Environmental Director	Ron Espell
Director, U.S. Technical Services	Jeff Snyder
Vice President - Projects	Simon Quick

Eureka County Board of Commissioners (Cooperating Agency)	
Natural Resources Manager	Jake Tibbitts
NDOW (Cooperating Agency)	
Eastern Region Mining Biologist	Lindsey Lesmeister
NPS (Cooperating Agency)	
Cultural Resource Specialist	Jill Jensen
USFWS (Cooperating Agency)	
Fish and Wildlife Biologist	Genevieve Skora
EPA	
Environmental Reviewer	Jamey Watt
Environmental Reviewer	Pat Kelly
NDEP	
Environmental Scientist	Matthew Donaldson

Table 5.6-2 Third Party Contractor – Stantec Consulting Services Inc.

Role/Resource	Staff	Experience
Principal in Charge	Brian Buck	BS Geology MS Geological Engineering 40 years experience
Project Manager	Kristi Schaff	BS Land Rehabilitation Minor in Soils 15 years experience
Assistant Project Manager/Noise	Michele Lefebvre	BA Biology Ph.D. Biology 11 years experience
Lead Author/Land Use and Access/Transportation/Recreation/ Environmental Justice/Visual Resources	Steve Morton	BA General Studies Emphasis in Political Science and English 13 years experience
Project Administration/Cumulative	Kim Carter	BA Journalism 13 years experience
Geochemistry Rock Characterization/ Hydrology	Robert C. Berry	Ph.D. Geology/Geochemistry 37 years experience
Air Quality	Kathy Houed	BS Mechanical Engineering 32 years experience
Vegetation Resources (including noxious weeds and special status species vegetation)/Rangeland Ecology/Wild Horses	Erica Freese	BS Rangeland Ecology and Management MS Rangeland Ecology and Management 11 years experience
Wildlife (including migratory birds and special status species wildlife)	Dave Kikkert	BS Fisheries and Wildlife MS Aquatic Ecology 15 years experience
Geology/Minerals	Walter Martin	BS Geological Sciences MS Geology 32 years experience
Soils	Wendy Broadhead	BA Art BA Anthropology BS Plant Science 26 years experience

Role/Resource	Staff	Experience
QA/QC	Benjamin Veach	BS Forestry 30 years experience
Cultural Resources/Paleontology/Native American Religious Concerns	Jenni Prince-Mahoney	BA Anthropology 31 years experience
Wetland and Riparian Resources	Diana Eck	BS Wildlife Biology 8 years experience
Hazardous Materials	Nancy Lightfoot	BS Geology 25 years of experience
GIS/Drafting	Christine Johnson	BS Geology 33 years of experience

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6.2 Glossary

Acre: A unit of land measure equal to 43,560 square feet.

Affecting: Will or may have an effect on.

Allotment: A unit of public land suitable and available for livestock grazing managed as one unit.

Alluvium: A general term for clay, silt, sand, gravel, or similar unconsolidated detrital material, deposited during comparatively recent geologic time by a stream or other body of running water

Ambient Noise: The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. Used to describe existing or pre-project conditions.

Animal Unit Month (AUM): The amount of forage required by one cow and calf, or their equivalent, for one month.

Aquifer: A zone, stratum, or group of strata acting as a hydraulic unit that stores or transmits water in sufficient quantities for beneficial use.

Artifact: Any object showing human workmanship or modification, especially from a prehistoric or historic culture.

Barren Solution: In a metallurgical process, the solution left after the value has been removed.

Bedrock: Solid rock exposed at the surface of the earth or overlain by unconsolidated material, weathered rock, or soil.

Cooperating Agency: Any federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment. The selection and responsibilities of a cooperating agency are described in Section 1501.6. A State or local agency of similar qualifications or, when the effects are on a reservation, an Indian Tribe, may by agreement with the lead agency become a cooperating agency.

Cumulative Impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Decibel (dB): Fundamental unit of sound, A Bell is defined as the logarithm of the ration of sound pressure squared over the reference pressure squared. A decibel is one-tenth of a bell.

A-Weighed Decibel (dBA): The most commonly used frequency weighting measure; simulates human sound perception and correlates well with human perception of the annoying aspects of noise.

Deposit: A natural accumulation, such as precious metals, minerals, coal, gas, oil, etc., that may be pursued for its intrinsic value; gold deposit.

Direct Impacts: Impacts caused by the action and occur at the same time and places (40 Code of Federal Regulations 1508.7), synonymous with direct effects.

Downgradient: In relation to any fixed point with regard to the direction of drainage or flow, downgradient is at a lower point of elevation than the chosen observation point and thus downward in relation to the direction of flow.

Drainage: The natural channel through which water flows some time of the year.

Drawdown: Vertical distance that a water elevation is lowered or the pressure head is reduced due to the removal of water from the same system.

Drill Pad: An earthen platform/bench created to provide stable support for a drill rig during drilling activities.

Effects include:
(a) Direct effects, which are caused by the action and occur at the same time and place.

(b) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

Ephemeral Drainage: A channel or drainage that flows only in direct response to precipitation or snow melt. Such flow is usually of short duration.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geologic agents, including such processes as gravitation creep.

Exploration: The search for economic deposits of minerals, ore, gas, oil, or coal through the practices of geology, geochemistry, geophysics, drilling, shaft sinking and/or mapping.

Feasible: Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Federal Agency: All agencies of the Federal Government. It does not mean the Congress, the Judiciary, or the President, including the performance of staff functions for the President in his Executive Office. For the purposes of regulation, it includes States and units of general local government and Indian tribes assuming NEPA responsibilities under section 104(h) of the Housing and Community Development Act of 1974.

Forage: All browse and non-woody plants that are available to livestock or game animals for grazing or harvestable for feed.

Fugitive Dust: Dust particles suspended randomly in the air from road travel, excavation, and rock loading operations.

Geochemistry: The study of the distribution and amounts of the chemical elements in minerals, ores, rocks, soils, water, and the atmosphere, and their circulation in nature, on the basis of the properties of their atoms and ions. The geology and chemistry concerned with the chemical composition of, and chemical reactions taking place within, the earth's crust.

Geotechnical: A branch of engineering that is essentially concerned with the engineering design aspects of slope stability, settlement, earth pressures, bearing capacity, seepage control, and erosion.

Groundwater: Water found beneath the land surface in the zone of saturation below the water table.

Groundwater Recovery: The increase in groundwater levels following drawdown.

Groundwater Table: The surface between the zone of aeration; that surface of a body of unconfined ground water at which the pressure is equal to that of the atmosphere.

Growth Media: All materials, including topsoil, specified soil horizons, vegetative debris, and organic matter, which are classified as suitable for stockpiling and/or reclamation.

Haul Road: A road used by large (>50-ton capacity) trucks to haul ore and waste rock from an open pit mine to other locations.

Heap Leaching: An ore extraction method used for low to moderate grade ores, which involves placing the ore in a mound and then “leaching” by percolation of a solution which dissolves target metals from the rock.

HDPE (High Density Polyethylene): A plastic, impermeable material used for liners. This material deforms with a low probability of puncturing or splitting. Seams are heat welded instead of glued, thus preventing rupture.

Human Environment: Shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of “effects” (Sec. 1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.

Hydrographic Basin: An extent or an area of land where surface water from rain and melting snow or ice converges to a single point in the basin where the waters join another waterbody, such as a river, lake, reservoir, estuary, wetland, sea, or ocean.

Impact: A modification in the status of the environment brought about by the Proposed Action or alternatives.

Indirect Impacts: Impacts that are caused by the action and are later in time or farther removed in distance, bur are still reasonably foreseeable (40 Code of Federal Regulations 1508.8); synonymous with indirect effects.

Irreversible and Irretrievable Commitments of Resources: Irreversible commitments of resources occur when, once committed to the proposed project components, the resource would continue to be committed throughout the life of the proposed project. An irretrievable commitment of the resources refers to those resources that, once used, consumed, destroyed, or degraded during construction, operations, or decommissioning of the proposed project components, would cause the resource to be unavailable for use by future generations.

Key Observation Point (KOP): A specific place on a travel route or within an existing or potential use area where the view of a management activity or project would be most revealing for purposes of the contrast rating.

Kinetic Testing: A method of testing rock materials to simulate natural weather; used to test the acid-generating potential of rock.

$\mathbf{L_{eq}}$: Equivalent or energy-averaged sound level.

$\mathbf{L_{max}}$: The highest root-mean-square sound level measured over a given period of time.

$\mathbf{L_{(n)}}$: The sounds level exceeded a described percentile over a measurement period. For example, an hourly L_{50} is the sound level exceeded 50% of the time during the one-hour period.

Lead Agency: The agency or agencies preparing or having taken primary responsibility for preparing the environmental impact statement.

Leaching: The process of applying a chemical agent that bonds preferentially and dissolves into solution the target metal(s) in an ore. The metal complexes or binds to the solution, which is then called a “pregnant” solution. The pregnant solution is collected for processing to recover the metal(s).

Major Federal Action: Includes actions with effects that may be major and which are potentially subject to federal control and responsibility. Major reinforces but does not have a meaning independent of significantly (Sec. 1508.27). Actions include the circumstance where the responsible officials fail to act and that failure to act is reviewable by courts or administrative tribunals under the Administrative Procedure Act or other applicable law as agency action.

(a) Actions include new and continuing activities, including projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies; new or revised agency rules, regulations, plans, policies, or procedures; and legislative proposals (Secs. 1506.8, 1508.17). Actions do not include funding assistance solely in the form of general revenue sharing funds, distributed under the State and Local Fiscal Assistance Act of 1972, 31 U.S.C. 1221 et

seq., with no Federal agency control over the subsequent use of such funds. Actions do not include bringing judicial or administrative civil or criminal enforcement actions.

(b) Federal actions tend to fall within one of the following categories:

Adoption of official policy, such as rules, regulations, and interpretations adopted pursuant to the Administrative Procedure Act, 5 U.S.C. 551 et seq.; treaties and international conventions or agreements; formal documents establishing an agency's policies which will result in or substantially alter agency programs.

Adoption of formal plans, such as official documents prepared or approved by federal agencies which guide or prescribe alternative uses of Federal resources, upon which future agency actions will be based.

Adoption of programs, such as a group of concerted actions to implement a specific policy or plan; systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive.

Approval of specific projects, such as construction or management activities located in a defined geographic area. Projects include actions approved by permit or other regulatory decision as well as federal and federally-assisted activities.

Pit: Excavation area from which ore and waste rock are removed.

Mining Claim: A portion of the Public Domain or related lands which a miner, for mining purposes, takes and holds in accordance with mining laws.

Mitigation includes:
(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

Monitor: To watch systematically and repeatedly, observe, or measure environmental conditions to rack changes.

National Environmental Policy Act: The National Environmental Policy Act (NEPA) of 1969; the national charger for protection the environment. NEPA establishes policy, sets goas, and provides means for carrying out the policy. Regulations from 40 Code of Federal Regulations 1500-1508 implement the act.

NEPA Process: All measures necessary for compliance with the requirements of section 2 and Title I of the National Environmental Policy Act (NEPA).

National Pollution Discharge Elimination System: A part of the Clean Water Act that requires point source discharges to obtain permits. These permits are referred to as National Pollutant Discharge Elimination System (NPDES) permits and are administered by the U.S. Environmental Protection Agency (EPA).

National Register of Historic Places: A list, maintained by the National Park Service, of areas that have been designated as being of historical significance.

Noise: Unwanted sound; one that interferes with ones' hearing of something; a sound that lacks agreeable musical quality or is noticeable unpleasant.

Notice of Intent: A notice that an environmental impact statement will be prepared and considered. The notice shall briefly:
(a) Describe the proposed action and possible alternatives.
(b) Describe the agency's proposed scoping process including whether, when, and where any scoping meeting will be held.
(c) State the name and address of a person within the agency who can answer questions about the proposed action and the environmental impact statement.

"Proposal" exists at that stage in the development of an action when an agency subject to the Act has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated. Preparation of an environmental impact statement on a proposal should be timed (Sec. 1502.5) so that the final statement may be completed in time for the statement to be included in any recommendation or report on the proposal. A proposal may exist in fact as well as by agency declaration that one exists.

Open Pit Mining: A type of mining that involves excavation of ore by digging downwards from the ground surface, removing the overburden and extracting the ore beneath. The result of the mining operation is an "open pit."

Ore: An earth material containing target metal(s) or mineral(s) in sufficient concentration and quantity which may be mined and processed at an economic profit.

Perennial Stream: A stream or reach of a stream that flows throughout the year.

pH: Symbol for the negative common logarithm of the hydrogen ion concentration (acidity) of a solution. The pH value of 7 is considered neutral. A pH value below 7 indicates acidity, and a pH value above 7 indicates alkalinity or a base.

Plan of Operations: A detailed description presenting the methods, timing, and contingencies to be used during the operation of the project. A document required from any person proposing to conduct mineral related activities which utilize earth moving equipment and which will cause disturbance to surface resources.

PM_{10}: Particulate matter less than 10 microns in aerodynamic diameter.

Pregnant Solution: The resulting metal-laden solution collected from the leaching of ore which contains dissolved metal values. The metal values are recovered from this pregnant solution, which then becomes the barren solution that is typically refortified with necessary reagents and reintroduced into the leaching circuit.

Reclamation: Returning disturbed land to a form and productivity in conformity with a predetermined land management plan or a government approved plan or permit.

Record of Decision: A document separate from but associated with an Environmental Impact Statement which states the decision; identifies all alternatives, specifying which were

environmentally preferable; and states whether all practicable means to avoid environmental harm from the alternative have been adopted, and if not, why not (40 CFR 1505.2).

Relationships Between Short-Term Use and Long-Term Productivity: Those relationships which tie short-term use to the long-term condition and viability of a given resource value (an example would be the long-term effects of overgrazing on range productivity and condition).

Right-of-Way: Strip of public land or corridor over which a utility corridor or access road passes.

Riparian: Pertaining to or situated on the bank of a body of water, especially of a watercourse such as a river.

Scope: Consists of the range of actions, alternatives, and impacts to be considered in an environmental impact statement. The scope of an individual statement may depend on its relationships to other statements (Secs.1502.20 and 1508.28). To determine the scope of environmental impact statements, agencies shall consider three types of actions, three types of alternatives, and three types of impacts. They include:

(a) Actions (other than unconnected single actions) which may be:
Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:
(i) Automatically trigger other actions which may require environmental impact statements.
(ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
(iii) Are interdependent parts of a larger action and depend on the larger action for their justification.

Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.

Similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement.

(b) Alternatives, which include:
No action alternative.
Other reasonable courses of actions.
Mitigation measures (not in the proposed action).

(c) Impacts, which may be: (1) Direct; (2) indirect; (3) cumulative.

Significantly: As used in NEPA requires considerations of both context and intensity:
(a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

2) The degree to which the proposed action affects public health or safety.

3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

4) The degree to which the effects on the quality of the human environment are likely to be controversial.

5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

10) Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

Surface Water: Water found in ponds, lakes, inland seas, streams, and rivers or above the ground surface.

Third-Party Contractor: An independent firm contracted by a government agency to perform work related to a proposed action or another organization; due to the financial and contractual arrangements governing such relationships, the third-party contractor has no financial or other interest in the decision to be reached on the project.

Upgradient: In relation to any fixed point with regard to the direction of drainage or flow, upgradient is at a higher point of elevation than the chosen observation point and thus upward in relation to the direction of flow.

Visual Resources: The composite of basic terrain, geologic features, water features, vegetation patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for viewers.

Visual Resource Management Classes: A classification of landscapes according to the kinds of structures and changes that are acceptable to meet established visual goals (BLM).

Waste Rock: A non-ore rock that is removed to access the ore zone. It contains target metal(s) or mineral(s) below the economic cutoff level, and must be removed to gain access to the ore zone.

Waste Rock Disposal Areas (WRDA): Also called waste rock facilities or stockpile area; an area where waste rock (loose or consolidated rock material that overlies a mineral deposit) is placed during mining either temporarily or permanently.

Watershed: The entire land area that contributes water to a particular drainage system or stream.

Water Table: The level in the saturated zone at which the pressure is equal to the atmospheric pressure.

Waters of the United States: A jurisdictional term from Section 404 of the Clean Water Act referring to water bodies such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. The use, degradation, or destruction of these waters could affect interstate or foreign commerce.

Wetland: “For CWA regulatory purposes, the Corps (33 CFR 328.3) and EPA (40 CFR 230.3) jointly define wetlands as: ... those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” (USACE, 2002). Other definitions include hydric soils as a component.

Wilderness Areas: Wilderness areas are designated by Congress under the authority of the Wilderness Act of 1964 and comprise the National Wilderness Preservation System.

6.3 Index

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APPENDIX A
GREATER SAGE-GROUSE REQUIRED DESIGN FEATURES

Table 1 Minerals Resources Management Decisions for Locatable Minerals

MDMR #	MDMR Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
15	Review **Objective SSS 4**, and to the extent allowed by law, apply **MDs SSS 1 through SSS 4** when reviewing and analyzing projects and activities proposed in GRSG habitat. (Note: SSS 1 through SSS 4 are addressed below in **Table 2**).	Yes	Yes	No	Yes	Yes	Yes	Objective SSS 4: In PHMAs and GHMAs, apply the concept of "avoid, minimize, and compensatory mitigation" for all human disturbance in areas not already excluded or closed, so as to avoid adverse effects on GRSG and its habitat. The first priority will be to avoid new disturbances (GRSG Amendment, Appendices F and I). The proposed Project is a non-discretionary 43 CFR 3809 action, therefore implementing this management decision is limited to preventing unnecessary and undue degradation. The BLM is coordinating with MMI to determine appropriate mitigation to offset residual impacts using either the State of Nevada's Conservation Credit System (CCS) or a proponent driven plan.
16	Recommend for withdrawal SFA under the General Mining Act of 1872, as amended, subject to valid existing rights (see Appendix A; Figures 2-1 and 2-4).	No	-	-	-	-	-	No Sagebrush Focal Areas (SFAs) are located within or in proximity to the Project boundary.
17	On public lands, manage disturbances associated with notice-level activity in GRSG habitat on a landscape basis to avoid segmenting a project. Do this by encouraging operators and claimants to consolidate exploration into a plan of operations to reduce the proliferation of mining notices, in accordance with 43 CFR, Part 3809.21(b).	Yes	Yes	Yes	Yes	Yes	No	Exploration is proposed for this Project; therefore, the exploration in the Project area would be associated with the Plan.
18	Subject to valid existing rights and applicable law, authorize locatable mineral development activity, by approving plans of operation and apply mitigation and best management practices that minimize the loss of PHMAs and GHMAs or that enhance GRSG habitat by applying the "avoid, minimize and compensatory mitigation" process through an applicable mitigation system, such as the Nevada Conservation Credit System.	Yes	Yes	Yes	Yes	Yes	Yes	The proposed Project is a non-discretionary 43 CFR 3809 action, therefore implementing this management decision is limited to preventing unnecessary and undue degradation. Avoidance and minimization measures are discussed in **Section 2.2.20**. The BLM is coordinating with MMI to determine appropriate mitigation to offset residual impacts using either the State of Nevada's Conservation Credit System (CCS) or a proponent driven plan.
19	Close or mitigate abandoned mine sites in PHMAs and GHMAs to reduce GRSG predation by eliminating physical structures that could provide nesting opportunities and perching sites for predators.	No	-	-	-	-	-	This would be an active Project area therefore this MD does not apply to this Project. Site reclamation is described in **Section 2.2.19**.

Table 2 Management Decision(s) SSS 1 through SSS 4

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 1	In PHMAs and GHMAs, work with the proponent/applicant, whether in accordance with a valid existing right or not, and use the following screening criteria to avoid effects of the proposed human activity on GRSG habitat: A. First priority – locate project/activity outside PHMAs and GHMAs B. Second priority – If the project/activity cannot be placed outside PHMAs and GHMAs, locate the surface-disturbing activities in non-habitat areas first, then in the least suitable habitat for GRSG C. Third priority – collocate the project/activity next to or in the footprint of existing infrastructure	Yes	Yes	Yes	Yes	Yes	Yes	The Project cannot be located outside of PHMA or GHMA; however, the proposed Project is located at the site of the previous Atlas Mine. Therefore, this project would be collocated with the existing footprint of the previous mine. The 25 kV overhead distribution line would be collocated with existing power line features where possible.
SSS 2 (PHMA)	In PHMAs, the following conditions will be met in order to avoid, minimize, and mitigate any effects on GRSG and its habitat from the project/activity:							
SSS 2A (PHMA)	Manage discrete anthropogenic disturbances, whether temporary or permanent, so they cover less than 3 percent of 1) biologically significant units (BSUs; total PHMA area associated with a GRSG population area (see Appendix A; Figure 2-2) and 2) in a proposed project analysis area. See Appendix E (Disturbance Cap Guidance) for additional information on implementing the disturbance cap, including what is and is not considered disturbance and how to calculate the proposed project analysis area, as follows: 1. If the 3 percent human disturbance cap is exceeded on all lands (regardless of ownership) in PHMAs in any given BSU, then no further discrete human disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, as amended, and valid existing rights) will be permitted, by BLM within GRSG PHMA in any given BSU until the disturbance has been reduced to less than the cap (see Nevada exception under MD SSS 2 a. 3. Appendix E). 2. If the 3 percent disturbance cap is exceeded on all lands (regardless of land ownership) within a proposed project analysis area in a PHMA, then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as the 1872 Mining Law, as amended, valid existing rights; see Nevada exception under MD SSS 2 a. 3. Appendix E).	No	-	-	-	-	-	GRSG Amendment Appendix E directs that the disturbance cap analysis should be conducted and results provided in NEPA analyses, but any exceedances of the cap (at both the BSU and project levels scales) do not apply to locatable mineral resources project with existing valid rights from BLM approval.
SSS 2B (PHMA)	In PHMA, in undertaking BLM management actions, and consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. The project/activity with associated mitigation (such as the use of the State of Nevada Conservation Credit System) will result in an overall net conservation gain to GRSG (Appendix F).	Yes	Yes	Yes	Yes	Yes	Yes	The BLM is coordinating with MMI to determine appropriate mitigation to offset residual impacts in PHMA using either the State of Nevada's Conservation Credit System (CCS) or a proponent driven plan.

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 2C (PHMA)	Authorized/permitted activities are implemented by adhering to the RDFs described in Appendix C, consistent with applicable law. At the site-specific scale, if an RDF is not implemented, at least one of the following must be demonstrated in the NEPA analysis associated with the project/activity: 1. A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to the site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. 2. An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. 3. A specific RDF will provide no additional protection to GRSG or its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. MMI has committed to the EPMs presented in **Section 2.2.20**.
SSS 2D (PHMA)	In management actions, and consistent with valid and existing rights and applicable law in authorizing third- party actions, the BLM will apply the lek buffer-distances identified in the USGS report, Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review Open File-Report 2014-1239 (Manier et al., 2014), in accordance with Appendix B.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. The Project holds valid existing rights and therefore is not subject to lek buffer distances identified in Appendix B of the GRSG Amendment.
SSS 2E (PHMA)	Seasonal restrictions will be applied during the period specified below to manage discretionary surface- disturbing activities and uses on public lands to prevent disturbances to GRSG during seasonal life-cycle periods: 1. In breeding habitat within 4 miles of active and pending GRSG leks from March 1 through June 30 a. Lek—March 1 to May 15 b. Lek hourly restrictions—6 p.m. to 9 a.m. c. Nesting—April 1 to June 30 2. Brood-rearing habitat from May 15 to September 15 a. Early—May 15 to June 15 b. Late—June 15 to September 15 3. Winter habitat from November 1 to February 28 The seasonal dates may be modified due to documented local variations (e.g., higher/lower elevations) or annual climatic fluctuations (e.g., early/late spring, long/heavy winter), in coordination with NDOW, in order to better protect GRSG and its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. MMI has committed to the following measures: • Travel timing restrictions would be implemented during lekking season (March 1 – May 15) on Three Bars Road and Roberts Creek Road, from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM. Emergency and local traffic would be exempt from these restrictions. • Access road work, road maintenance-related work, gravel pit work conducted by MMI within four miles of an active or pending lek are subject to timing restrictions during lekking season (March 1 – May 15) from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM.

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 2F (PHMA)	Authorizations and permits will limit noise from discretionary activities (during construction, operation, and maintenance) to not exceed 10 decibels above ambient sound levels at least 0.25 mile from active and pending leks, from 2 hours before to 2 hours after sunrise and sunset during the breeding season. See Appendix M, Greater Sage-Grouse Noise Protocol.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and therefore this MD is not applicable. However, the project is not expected to increase noise levels more than 10 dBA above ambient levels at near-by lek locations. This is discussed is detail in **Section 4.21.2**. Additionally, MMI has committed to the following EPMs: • Noise from generators could be shielded by a combination of a sound enclosure at the generator with an additional sound wall constructed adjacent to and between the generators and the leks, if required. Should a sound wall be necessary, it would be approximately 14 feet tall to attenuate the generator noise at the leks. • Noise would also be reduced through installation of an enhanced generator silencing package on the generators. • Berms would be constructed along the haul roads in conformance with MSHA requirements that would also assist in the attenuation of noise along the haul roads.
SSS 3 (GHMA)	In GHMAs, the following conditions will be met in order to avoid, minimize, and mitigate any effects on GRSG or its habitat from the project/activity:							
SSS 3A (GHMA)	In GHMAs, in undertaking BLM management actions, and consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. The project/activity with associated mitigation (such as the use of the State of Nevada Conservation Credit System) in GHMAs will result in an overall net conservation gain to GRSG (Appendix F, Regional Mitigation Strategy).	Yes	Yes	Yes	Yes	Yes	Yes	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. The BLM is coordinating with MMI to determine appropriate mitigation to offset residual impacts using either the State of Nevada's Conservation Credit System (CCS) or a proponent driven plan.

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 3B (GHMA)	Authorized/permitted activities are implemented adhering to the RDFs described in Appendix C, consistent with applicable law. At the site-specific scale, if an RDF is not implemented, at least one of the following must be demonstrated in the NEPA analysis associated with the project/activity: 1. A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to the site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. 2. An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. 3. A specific RDF will provide no additional protection to GRSG or its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. MMI has committed to the EPMs presented in **Section 2.2.20**.
SSS 3C (GHMA)	In undertaking BLM management actions, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will apply the lek buffer-distances identified in the USGS report, Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review Open File Report 2014-1239 (Manier et al., 2014), in accordance with Appendix B.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation.
SSS 3D (GHMA)	Seasonal restrictions will be applied during the period specified below to manage discretionary surface- disturbing activities and uses on public lands to prevent disturbing GRSG during seasonal life cycle periods, as follows: 1. In breeding habitat within 4 miles of active and pending GRSG leks from March 1 through June 30 a. Lek—March 1 to May 15 b. Lek hourly restrictions—6 p.m. to 9 a.m. c. Nesting—April 1 to June 30 2. Brood-rearing habitat from May 15 to September 15 a. Early—May 15 to June 15 b. Late—June 15 to September 15 3. Winter habitat from November 1 to February 28 The seasonal dates may be modified due to documented local variations (e.g., higher/lower elevations) or annual climatic fluctuations (e.g., early/late spring, long/heavy winter), in coordination with NDOW, in order to better protect GRSG and its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. MMI has committed to the following EPMs: • Travel timing restrictions would be implemented during lekking season (March 1 – May 15) on Three Bars Road and Roberts Creek Road, from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM. Emergency and local traffic would be exempt from these restrictions. • Access road work, road maintenance-related work, gravel pit work conducted by MMI within four miles of an active or pending lek are subject to timing restrictions during lekking season (March 1 – May 15) from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM.

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 3E (GHMA)	Authorizations and permits will limit noise from discretionary activities (during construction, operation, and maintenance) to not exceed 10 decibels above ambient sound levels at least 0.25 mile from active and pending leks, from 2 hours before to 2 hours after sunrise and sunset during the breeding season. See Appendix M, Greater Sage-Grouse Noise Protocol.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and therefore this MD is not applicable. However, MMI has committed to the following EPMs: • Noise from generators could be shielded by a combination of a sound enclosure at the generator with an additional sound wall constructed adjacent to and between the generators and the leks, if required. Should a sound wall be necessary, it would be approximately 14 feet tall to attenuate the generator noise at the leks. • Noise would also be reduced through installation of an enhanced generator silencing package on the generators. • Berms would be constructed along the haul roads in conformance with MSHA requirements that would also assist in the attenuation of noise along the haul roads.
SSS 4 (OHMA)	In OHMAs, authorized/permitted activities are implemented adhering to the RDFs described in Appendix C, consistent with applicable law. At the site-specific scale, if an RDF is not implemented, at least one of the following must be demonstrated in the NEPA analysis associated with the project/activity: 1. A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to the site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. 2. An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. 3. A specific RDF will provide no additional protection to GRSG or its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. There is no OHMA present within the Project boundary. There is OHMA present along the 25 kV overhead distribution line alternative alignment.

Table 3 General Required Design Features

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
Gen 1	Locate new roads outside of GRSG habitat to the extent practical.	No	Most roads associated with this project are existing and would only be improved for safety and to allow for heavy-haul traffic. Access to the mine would be on existing roads. Roads are described in **Section 2.2.2**.
Gen 2	Avoid constructing roads within riparian areas and ephemeral drainages. Construct low-water crossings at right angles to ephemeral drainages and stream crossings (note that such construction may require permitting under Sections 401 and 404 of the Clean Water Act).	No	No riparian areas are present within the Project boundary.
Gen 3	Limit construction of new roads where roads are already in existence and could be used or upgraded to meet the needs of the project or operation. Design roads to an appropriate standard, no higher than necessary, to accommodate intended purpose and level of use.	No	Most roads associated with this project are existing and would only be improved for safety and to allow for heavy-haul traffic. Access to the mine would be on existing roads. Roads are described in **Section 2.2.2**.
Gen 4	Coordinate road construction and use with ROW holders to minimize disturbance to the extent possible.	No	The Project is not anticipated to impact any ROWs (**Section 4.10.2**).
Gen 5	During project construction and operation, establish and post speed limits in GRSG habitat to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.	No	MMI has committed to the following EPM: • Speed limits would be posted at 35 miles per hour (mph) on haul roads and 45 mph on access roads.
Gen 6	Newly constructed project roads that access valid existing rights would not be managed as public access roads. Proponents will restrict access by employing traffic control devices such as signage, gates, and fencing.	No	Site access is described in **Section 2.2.7**, and would include fencing and gates.
Gen 7	Require dust abatement practices when authorizing use on roads.	No	MMI has committed to the following EPMs: • A fugitive dust control program would provide for water application on haul roads and other disturbed areas; chemical dust suppressant application (such as Lignin sulfate or magnesium chloride) where appropriate; and other dust control measures. • Dust generated from the use of roads and excavation activities would be minimized to the extent reasonable and practicable by using BMPs such as minimizing vehicular traffic, and using prudent vehicle speeds. Fugitive emissions in the process area would be controlled at the crusher, and conveyor drop points through the use of bag houses and/or water sprays, where necessary. Other process areas requiring dust and/or emission controls would include the cement/lime silos, ADR Plant, the various ancillary screening and sizing processes, agglomerator, refinery, generators, and the laboratory. Appropriate emission control equipment would be installed and operated in accordance with an NDEP-issued Air Quality Operating Permit.
Gen 8	There is no Gen 8 RDF.	No	-
Gen 9	Upon project completion, reclaim roads developed for project access on public lands unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.	No	Road closure is described in **Section 2.2.19**.
Gen 10	Design or site permanent structures that create movement (e.g., pump jack/ windmill) to minimize impacts on GRSG habitat.	No	These types of structures are not proposed for this Project.
Gen 11	Equip temporary and permanent aboveground facilities with structures or devices that discourage nesting and perching of raptors, corvids, and other predators.	No	MMI has committed to the following EPMs: • Any overhead power lines within four miles of active and pending active leks would be constructed with anti-perching devices, where applicable. Actions would be completed in consideration of the latest Avian Power Line Interaction Committee guidelines with assistance of BLM and NDOW for the appropriate predatory bird anti-perching devices. • Fences in the process area would be continuous, with no breaks, except for gates, that would be kept closed; and smooth or barbed wire would be used above the top horizontal portion of fencing to discourage perching. • MMI would consider obtaining a Raven Depredation Permit from United States Fish and Wildlife Service (USFWS) or submit for coverage under an NDOW permit.

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
Gen 12	Control the spread and effects of nonnative, invasive plant species (e.g., by washing vehicles and equipment, minimize unnecessary surface disturbance; Evangelista et al. 2011). All projects would be required to have a noxious weed management plan in place prior to construction and operations.	No	The *Noxious Weed Plan for the Gold Bar Mine Project, Eureka County, Nevada* (GBE, 2013) was provided as Appendix D of the Plan of Operations. MMI has also committed to the following EPMs: • All vehicle and heavy equipment that may have been exposed to noxious weeds would be cleaned with a power or high-pressure washer prior to entering or leaving the Project mine boundary. Vehicle cleaning would minimize the transport of vehicle-borne weed seed, roots, or rhizomes. • To minimize the transport of soil-borne noxious weed seeds, roots or rhizomes infested soils or material would be stockpiled adjacent to the areas from which they were stripped. Appropriate measures would be taken to avoid wind or water erosion of the affected stockpile. • All interim and final seed mixes, hay, and straw products would be certified weed-free.
Gen 13	Implement project site-cleaning practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of GRSG.	No	The Class III-waivered landfill is described in **Section 2.2.7**. MMI has committed to the following EPM: • During all phases of the Project, all food, waste, and other trash would be placed in closed containers.
Gen 14	Locate project related temporary housing sites outside of GRSG habitat.	No	No temporary housing is proposed for this Project.
Gen 15	When interim reclamation is required, irrigate site to establish seedlings more quickly if the site requires it.	No	Reclamation is described in **Section 2.2.19**.
Gen 16	Utilize mulching techniques to expedite reclamation and to protect soils if the site requires it.	No	The use of mulch in the reclamation is discussed in **Section 2.2.19** and further detailed in the *Conceptual Reclamation/Revegetation Plan for the Gold Bar Project Waste Rock Dumps* (Cedar Creek, 2016), which was provided as Appendix O of the Plan of Operations.
Gen 17	Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.	No	Reclamation is described in **Section 2.2.19**.
Gen 18	When authorizing ground-disturbing activities, require the use of vegetation and soil reclamation standards suitable for the site type prior to construction.	No	Reclamation of disturbed areas resulting from the Project would be completed in accordance with BLM and NDEP regulations.
Gen 19	Instruct all construction employees to avoid harassment and disturbance of wildlife, especially during the GRSG breeding (e.g., courtship and nesting) season. In addition, pets shall not be permitted on site during construction (BLM 2005b).	No	MMI has committed to the following EPM: • New hire and annual refresher training for all employees and contractors would include greater sage-grouse specific protection training that specifically addresses the commitment of MMI to implement the protection program and the need for all employees to avoid harassment and disturbance of greater sage-grouse, especially during the breeding season. MMI would work with NDOW in the development of training materials.
Gen 20	To reduce predator perching in GRSG habitat, limit the construction of vertical facilities and fences to the minimum number and amount needed and install anti-perch devices where applicable.	No	See description for Gen RDF 11.
Gen 21	Outfit all reservoirs, pits, tanks, troughs or similar features with appropriate type and number of wildlife escape ramps (BLM 1990; Taylor and Tuttle 2007).	No	MMI has committed to the following EPM: • All lined ponds would be constructed with escape ramps consisting of textured liner to assist in a safe footing during egress, should any wildlife manage to gain access and inadvertently fall into one of the ponds.
Gen 22	Load and unload all equipment on existing roads to minimize disturbance to vegetation and soil.	No	Equipment would be loaded and unloaded in previously disturbed areas, when practicable.

[1] The proposed Project is a non-discretionary 43 CFR 3809 action; therefore, these RDF's are considered recommendations.

Table 4 Lands and Realty Required Design Features

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
LR 1	Where new ROWs associated with valid existing rights are required, co-locate new ROWs with existing ROWs or where it best to minimizes impacts in GRSG habitat. Use existing roads to access valid existing rights that are not yet developed.	No	Most roads associated with this project are existing and would only be improved for safety and to allow for heavy-haul traffic. Access to the mine would be on existing roads. Roads are described in **Section 2.2.2**.
LR 2	Don not issue ROWs to counties on newly constructed energy/mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.	No	There would be no ROWs issues to counties for this project.
LR 3	Where necessary, fit transmission towers with anti-perch devices (Lammers and Collopy 2007) in GRSG habitat.	No	MMI has committed to the following EPM: • Any overhead power lines within four miles of active and pending active leks would be constructed with anti-perching devices, where applicable. Actions would be completed in consideration of the latest Avian Power Line Interaction Committee guidelines with assistance of BLM and NDOW for the appropriate predatory bird anti-perching devices.

[1] The proposed Project is a non-discretionary 43 CFR 3809 action; therefore, these RDF's are considered recommendations.

Table 5 Fuels and Fire Management Required Design Features

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
WFM 1	Power-wash all fire fighting vehicles, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATVs), prior to deploying in or near GRSG habitat to minimize the introduction and spread of undesirable and invasive plan species.	No	The *Noxious Weed Plan for the Gold Bar Mine Project, Eureka County, Nevada* (GBE, 2013) was provided as Appendix D of the Plan of Operations. MMI has also committed to the following EPMs: • All vehicle and heavy equipment that may have been exposed to noxious weeds would be cleaned with a power or high-pressure washer prior to entering or leaving the Project mine boundary. Vehicle cleaning would minimize the transport of vehicle-borne weed seed, roots, or rhizomes. • To minimize the transport of soil-borne noxious weed seeds, roots or rhizomes infested soils or material would be stockpiled adjacent to the areas from which they were stripped. Appropriate measures would be taken to avoid wind or water erosion of the affected stockpile. All interim and final seed mixes, hay, and straw products would be certified weed-free.
WFM 2	Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.	No	MMI has committed to the following fire protection EPMs: • As specified by MSHA, MMI would institute a fire protection training program and would have a rehearsed fire suppression plan. A fire protection system would be installed that would incorporate Eureka County and State of Nevada code requirements in the administration and warehouse complexes, truck shop, crushing plant, and process plant. A 250,000-gallon fresh water/fire water tank would be located above the ADR plant, on the south side of the HLP to provide adequate water pressure for the operations and fire suppression system. A rangeland fuel break would be constructed around the facilities. Water trucks, used for dust suppression, would be available in the event of a fire. MMI would promptly comply with any emergency directives and requirements of Eureka County and the BLM pertaining to industrial operations during the fire season. • Light vehicles traveling outside of the main mining areas and along roads that traverse vegetated rangeland during fire season would carry a small water supply in order to control sparks that may be generated by exhaust. Vehicle catalytic converters would be inspected often and cleaned of all brush and grass debris. • When conducting welding operations, they would be conducted in an area free of or mostly free of vegetation. A minimum of 10 gallons of water and a shovel would be on hand to extinguish any fires created from the sparks. Extra personnel would be at the welding site to watch for fires created by welding sparks.
WFM 3	Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planning perennial vegetation (e.g. green-strips) paralleling road right-of-way	No	Reclamation is described in **Section 2.2.19**.

[1] The proposed Project is a non-discretionary 43 CFR 3809 action; therefore, these RDF's are considered recommendations.

Table 6 Locatable Minerals Required Design Features

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
LOC 1	Install noise shields to comply with noise restrictions (see Action SSS 7) when drilling during the breeding, nesting, brood-rearing, and/or wintering season. Apply GRSG seasonal timing restrictions when noise restrictions cannot be met (See Action SSS 6).	No	Noise modeling completed as part of the analysis does not anticipate noise levels from mining operations (including drilling) to exceed 10 decibels above ambient (**Section 4.21.2**). Additionally, MMI has committed to the following EPMs: • Travel timing restrictions would be implemented during lekking season (March 1 – May 15) on Three Bars Road and Roberts Creek Road, from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM. Emergency and local traffic would be exempt from these restrictions. • Access road work, road maintenance-related work, gravel pit work conducted by MMI within four miles of an active or pending lek are subject to timing restrictions during lekking season (March 1 – May 15) from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM.
LOC 2	Cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.	No	Proposed Project facilities are clustered around the existing Atlas Mine.
LOC 3	Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus.	No	Pits are not anticipated to produce pit lakes; therefore, this RDF would not be applicable to this project.
LOC 4	Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat: • Overbuild size of ponds for muddy and non-vegetated shorelines. • Build steep shorelines to decrease vegetation and increase wave actions. • Avoid flooding terrestrial vegetation in flat terrain or low lying areas. • Construct dams or impoundments that restrict down slope seepage or overflow. • Line the channel where discharge water flows into the pond with crushed rock. • Construct spillway with steep sides and line it with crushed rock. • Treat waters with larvicides to reduce mosquito production where water occurs on the surface.	No	Project is not expected to produce any additional water from mining operations. The process solution and event ponds are described in **Section 2.2.6**.
LOC 5	Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.	No	The reclamation plan is described in **Section 2.2.19**.
LOC 6	Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling, and revegetating cut and fill slopes.	No	The reclamation plan is described in **Section 2.2.19**.
LOC 7	Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.	No	Pits are too large for this RDF to be feasible; however, sage-grouse would be able to escape by flight or walking if ever present within the pits.

[1] The proposed Project is a non-discretionary 43 CFR 3809 action; therefore, these RDF's are considered recommendations.

APPENDIX B
EUREKA COUNTY MASTER PLAN CONSIDERATION

Eureka County Master Plan Consideration

The National Environmental Policy Act (NEPA) requires an Environmental Impact Statement (EIS) to discuss certain factors. See 42 United States Code § 4332(2) (C)(i-v). As set forth by NEPA's implementing regulations, one of these factors is potential conflicts between a proposed action and the objectives of federal, regional, state, and local land use plans, policies and controls for the area concerned. 40 Code of Federal Regulations (C.F.R.) § 1502.16. Where an inconsistency exists between the proposed and any approved state or local plan or law, the EIS should describe the extent to which the agency would reconcile its proposed action with the plan or law.

Also related to state and local planning, 40 C.F.R. § 1506.2(d) requires that the EIS "discuss any inconsistency of a proposed action with any approved state or local plan and laws," and if an inconsistency exists, describe "the extent to which the agency would reconcile its proposed action with the plan or law."

The Council on Environmental Quality (CEQ) regulations at 40 CFR 1502.16(c) require the Environmental Consequences section of an EIS to disclose "possible conflicts between the proposed action and the objectives of federal, regional, state, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned."

The CEQ has also provided guidance for situations where a proposed action conflicts with local plans, policies, and controls through their publication: *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations (46 Fed. Reg. 18026 (1981)).* Question 23c asks, "What options are available for the decisionmaker when **conflicts with such plans** or policies are identified?" CEQ's answer states, "After identifying any potential land use conflicts, the decisionmaker must weigh the significance of the conflicts, among all the other environmental and non-environmental factors that must be considered in reaching a rational and balanced decision. Unless precluded by other law from causing or contributing to any inconsistency with the land use plans, policies or controls, the decisionmaker retains the authority to go forward with the proposal, despite the potential conflict…"

The Eureka County 1973 Master Plan, updated in 2010, contains a description of the county, and its history, articulates various goals, objectives, policies, and restrictions, to seek to maintain and enhance local economic viability and development, and the rural quality of life in Eureka (Eureka County, 2010). It outlines recommendations for future land use planning and includes goals and policies for economic stability, security and growth, social stability, private property rights, local and private management of resources, recreational opportunities, transportation and utility infrastructure, easements and right-of-way's (ROWs), and public access to federal and state lands (Eureka County, 2010). It is divided into sections that focus on specific planning issues identified during the development of the Master Plan. Each section is referred to as an element. There are seven elements: Growth Management Element, Public Facilities and Services Element, Economic Development Element, Natural Resources & Federal or State Land Use Element, Land Use Element, Housing Element, and Water Resources Element. Titles are reserved for Transportation, Conservation, Historic Preservation, Open Space Elements, and Public Finance Elements.

The Natural Resources and Federal and State Land Use Element (referred to as the Natural Resource and Land Use Plan) was originally developed and included into the Master Plan in response to Nevada Senate Bill 40 (1983) which directs counties to develop plans and strategies for resources that occur within lands managed by federal and state agencies. The Natural Resource and Federal or State Land Use element is an executable policy for natural resource management and land use on federal and state administered lands in Eureka County (Eureka County, 2010).

This appendix is referenced in the EIS and provides an overview of the relevant goals, objectives, and policies of the Eureka County Master Plan for the resources discussed in the Environmental Consequences section in compliance with the CEQ regulations. The discussion of the Eureka County Master Plan goals, objectives, and policies is organized by resource type. Goals, objectives, and policies from the Eureka County Master Plan are in italics.

Air Quality

Air Quality is included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element. For Air Quality, the Eureka County Master Plan the defined goal is *to prevent significant deterioration of the superior air quality found in Eureka County*. Relevant objectives to this project associated with this goal focus on working with the State of Nevada and federal agencies air quality permitting process for developments that could diminish air quality, and developing best management practices for limiting unnecessary emissions from existing and new point and nonpoint sources. Additionally, Eureka County supports mining that *uses the best available science and technology to ensure adequate protection of land, air, and water resources*.

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: The Gold Bar Mine Project (Project) would not result in a significant deterioration of air quality. McEwen Mining Inc. (MMI) has committed to several environmental protection measures (EPMs) which would reduce fugitive dust from Project related disturbance. MMI would comply with all applicable State of Nevada air quality permits and regulations. Impacts from the Project are anticipated to be short-term and localized, with no substantial adverse effects to air quality.

Cultural Resources

Cultural resources are included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element as a topic along with historic and paleontological resources. For these resources, the defined goal is that *in coordination with federal state and local government planning agencies, tribal leadership and interested members of the public, determine the significance of cultural resource sites according to condition, content and relevance and increase the opportunity for educational, recreational, socio-cultural, and scientific uses of cultural and Paleontological resources.*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Any adverse impacts to National Register of Historic Places (NRHP) eligible cultural sites would be avoided. If avoidance is not feasible, measures to minimize or mitigate effects would be proposed

in accordance with a memorandum of agreement (MOA) and detailed in a Historic Properties Treatment Plan (HPTP) developed in coordination with the State Historic Preservation Office (SHPO). With implementation of the MOA, impacts from the Project are anticipated to be localized, short-term, and would result in no adverse effect.

Forest Products

Vegetation and Woodland Resources are included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element as two different topics. Vegetation is included as a primary resource with soil and watersheds. The defined goal for the primary resources of soil, vegetation, and watersheds, is *to maintain or improve the soil, vegetation and watershed resources in a manner that perpetuates and sustains a diversity of uses while fully supporting the custom, culture, economic stability, and viability of Eureka County and its individual citizens*. Relative to forest products, an objective associated with this goal is *to develop and implement an aggressive pinyon pine, juniper, and shrub abatement and control plan for all sites where invasion and/or senescence due to age of a stand is adversely affecting desirable vegetation and/or wildlife. Development of such plans will include technical references to Woodland or Rangeland Ecological Sites and other appropriate interpretations of specific soil series within a Soil Survey. Whenever possible, plans to reduce the density of pinyon or juniper will emphasize removal and use of the material for firewood, posts, or commercial products including chips for energy production. This item depends on continued access to all areas that are subject to future woodland manipulations.*

The defined goal for woodland resources is *to maintain or improve aspen and conifer tree health, vegetation diversity, wildlife and watershed values through active management of sites with the ecological potential for aspen, pinyon, or juniper woodlands and initiate thinning, removal, or other management measures.*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: The Project would remove approximately 482 acres of pinyon-juniper woodland, which would be reclaimed to a grass and forb dominated community, and eventually to a shrub dominated community. This would assist with habitat improvement for certain wildlife species. The Project is anticipated to have localized, long-term, minor adverse impacts on forest products, including pine nut harvesting, fuel wood cutting, and Christmas tree cutting on public land.

Geology and Minerals

For the resource, geology and minerals, the associated topic in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element is Locatable Minerals, Fluid Minerals, and Mineral Materials. For this topic, the defined goal is to *facilitate environmentally responsible exploration, development and reclamation of oil, gas, geothermal, locatable minerals, aggregate and similar resources on federal lands*. A relevant objective for this topic is for the County to *actively engage in NEPA analysis of environmental and community impacts related to proposed mineral, oil and gas development, including social, economic, and fiscal impacts*. Mining is the top employer in Eureka County and historically has been an important part of the county economy.

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: The Proposed Action would entail mining approximately 72.5 million tons of waste rock and 13 million tons of ore, and ship offsite approximately 325,000 ounces of gold over the life of the Project. The disturbances constitute a fraction of a percent in the study area of the acreage containing the geologic and mineral resources. MMI would reclaim approximately 975 acres of Project related disturbance (approximately 86 percent of the total Project related disturbance), as well as an additional approximately 25 acres of non-MMI disturbance (1,000 acres of total reclamation). This would include 395 acres of the existing disturbance within the Plan boundary, which constitutes an environmentally responsible approach to mining and exploration. The Proposed Action involves a permanent but minor to negligible adverse effect on the regional geologic and mineral resource.

Grazing Management

Forage and Livestock Grazing included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element as a topic. Open space agriculture is the single greatest land use (2.4 million acres) in Eureka County, which includes livestock grazing and crops (Eureka County, 2010). The defined goal for forage and livestock grazing is to *provide for landscape vegetation maintenance and improvement that will:*

1) *Support restoration of suspended AUMs;*
2) *Support allocation of continuously available temporary non-renewable use as active preference;*
3) *Support allocation of forage produced in excess of the original adjudicated amounts where greater amounts of forage are demonstrated to be present;*
4) *Restore livestock numbers of individual ranches to at least the full levels at the time of grazing allotment adjudications; and*
5) *Restore wildlife populations to those peak levels of the mid-19*90's.

Relevant objectives for this goal include: *identify and implement all economically and technically feasible livestock distribution, forage production enhancement, and weed control programs before seeking changes in livestock stocking rates* and a*ssure that all grazing management actions and strategies fully consider impact on property rights of inholders and adjacent private land owners and consider the potential impacts of such actions on grazing animal health and productivity.* Additionally, Eureka County supports mining that *uses the best available science and technology to ensure adequate protection of land, air, and water resources*.

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Adverse impacts to livestock grazing from the Proposed Action are anticipated to be temporary, regional, and minor. Less than one percent of animal unit months (AUMs) within allotments and pastures affected by the Proposed Action would be lost temporarily or permanently. Indirect impacts from the Project include economic impacts from the potential reduction in AUMs from the Proposed

Action. These impacts would be long-term, regional, and minor to the ranching community and agricultural or grazing sector of Nevada's or Eureka County's economy, but the economic impact to the affected permittees could be long-term, regional, and moderate. However, approximately 4,518 acres (approximately 81 percent) of the Project area consists of woodland communities, and approximately 942 acres (approximately 17 percent) consists of prior mining-related disturbance or existing roads. Neither the woodland communities or the existing disturbance within the Plan boundary, both of which make up 98 percent of the Plan boundary, would be considered prime forage area for livestock. In addition, any adjustment to permitted AUMs would be based on forage lost, removed, or otherwise inaccessible due to mining operation. AUMs can be reinstated once reclamation has been successfully completed, and successful reclamation may also increase the forage quality and quantity because much of the disturbed area is currently pinyon-juniper woodland that would be reseeded with grasses, forbs, and shrubs

Hazardous or Solid Waste

Hazardous, or Solid Waste are discussed in Element 4, Public Facilities and Services. The section discusses solid waste and materials as a separate header. The defined goal for Solid Waste and Materials is *to provide solid waste and hazardous waste management to meet the needs of planned land uses, with systems that are cost-effective and environmentally sound.*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Small quantities of hazardous waste would be temporarily stored per federal, state, and local regulations. Most of the hazardous materials used on site would be spent or consumed during operations. Materials that were not spent or consumed, such as used antifreeze and oil, would be recycled or disposed off-site in accordance with applicable federal, state, and local regulations. Based upon the small quantities of hazardous waste that would be generated by the Proposed Action, an accident resulting in a release of hazardous waste to the environment during transportation from the Proposed Action is not anticipated. Sanitary liquid wastes would be handled and disposed of through septic tanks/leach fields permitted by the NDEP. Impacts from hazardous and solid waste from the Project are not expected to be long-term and would be regional and minor.

Historic Trails

There are no specific goals identified related to historic trails in the Eureka County Master Plan. Cultural resources are included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element as a topic along with historic and paleontological resources. For these resources, the defined goal is that *in coordination with federal state and local government planning agencies, tribal leadership and interested members of the public, determine the significance of cultural resource sites according to condition, content and relevance and increase the opportunity for educational, recreational, socio-cultural, and scientific uses of cultural and Paleontological resources.*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: During construction and operation of the Project, impacts may occur to the intended setting of the Pony

Express National Historic Trail (NHT), which would include visual impacts from Project disturbance, construction equipment, vehicle traffic, and personnel, as well as additional noise generated from Project operations. However, based on the viewshed analysis completed for the Project, existing mining-related disturbance is already visible from the NHT, so impacts from the Proposed Action would be a continuation of current conditions. The degree of visual contrast and impacts to the Pony Express NHT's setting associated with the Project would be reduced following reclamation. Noise impacts from Project operations are anticipated to be short-term, localized, and moderate. However, the project is using an enhanced silencing package which would reduce impacts from generator noise. All other impacts are anticipated to be negligible to minor.

Land Use, Access, Realty, and Transportation

Land use, access, realty, and transportation are discussed in several Elements of the Eureka County Master Plan, specifically, Growth Management, Public Facilities and Services, and Economic Development Elements. Goals, objectives, and policies related to these resources seek to maintain and enhance local economic viability and rural quality of life in Eureka County.

Goals in the Growth Management Element include:

- *Encourage new development in Eureka County in a planned and orderly manner consistent with the maintenance of existing quality of life, environmental attributes, and fiscal resource limits of the County;*

- *Encourage new development in areas in or proximate to existing communities where public infrastructure can be efficiently provided and a sense of community can be established or improved;*

- *Accommodate new development at a rate which can be adequately served by available community facilities and services;*

- *Ensure that development and use of land occurs in a manner which promotes the health, safety, and welfare of Eureka County residents;*

Goals in the Public Facilities and Services Element include:

- *To provide for the organized planning, funding, construction, and maintenance of infrastructure at locations consistent with planned land uses and with capacities which are adequate to meet the needs of these planned land uses;*

- *To build and maintain a transportation system which combines a mix of transportation modes and transportation system management techniques, and which is designed to meet the needs of the County's Land Use plan while minimizing the transportation systems' impacts on air quality, the environment, and adjacent development.*

- *To plan, build, and maintain a system of major roadways which provides adequate service to the County's planned land uses, integrates automobile use and the other modes of transportation, and minimizes environmental impacts.*

Goals in the Economic Development Element include:

- *Retain and expand existing business and industry; and*
- *Diversify and expand the Eureka County economy.*

Policies and objectives relative to these goals and the project include:

- *Eureka County encourages development which minimizes impacts to sensitive environmental areas*
- *Eureka County may identify and pursue mining industry induced industrial development opportunities; and*
- *Eureka County may encourage the productivity of existing "Building Blocks" beginning with such assets of a work force and natural resources including water, minerals, livestock forage, and wildlife.*

As the Natural Resource and Federal or State Land Use element is an executable policy for natural resource management and land use on federal and state administered lands in Eureka County, some of the goals of this element pertain to lands and realty in addition to other resources listed here. These include the following:

- *To maintain and improve the soil, vegetation and watershed resources in a manner that perpetuates and sustains a diversity of uses while fully supporting the custom, culture, and economic stability and viability of Eureka County and its individual citizens;*
- *Facilitate environmentally responsible exploration, development and reclamation of oil, gas, geothermal, locatable minerals, aggregate and similar resources on federal lands;*
- *Prevent significant deterioration of the superior air quality found in Eureka County; and*
- *Maintain, improve or mitigate wildlife impacts to habitat in order to sustain viable and harvestable populations of big game and upland game species as well a wetland/riparian habitat for waterfowl, fur bearers and a diversity of other game and non-game species.*

Primary planning guidance of the Natural Resource and Land Use Plan is found in Eureka County Code Title 9, Chapters 30, 40 and 50. Eureka County Code 9.30.060(E) states, *It is critical to the welfare of the citizens of Eureka County and the nation that mining on state and federal lands remains an open and free enterprise. Eureka County upholds the tenet that mining claims are compensable property belonging to individuals or groups of individuals* (Eureka County, 2010). The primary guidance for mining activities within Chapter 30 that pertain to lands and realty includes (Eureka County, 2010):

- *Retention of and compliance with the 1872 Mining Law as amended;*
- *Compliance with mine reclamation activities as per NRS Chapter 519A;*
- *Use of best available science and technology to ensure adequate protection of land, air, and water resources;*

- *Mitigation of mining activities that may impair the economic future of Eureka County citizens through bilateral or multi-lateral consultations with the Board of Eureka County Commissioners; and*

- *Disposal of mine dewatering water in a manner that returns water to the ground in the same basin it is withdrawn with minimal evaporation and transpiration loss.*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Project related disturbance from mining and processing facilities would result in the direct loss of public land for multiple use authorizations for the seven-year life of the mine. However, there is adequate public land adjacent to the Project boundary for multiple use authorizations during the life of the Project, so impacts to multiple land use authorizations from the loss of this area for multiple use authorizations would be short-term, localized, and minor. MMI would reclaim approximately 975 acres of Project related disturbance (approximately 86 percent of the total Project related disturbance), as well as an additional approximately 25 acres of non-MMI disturbance (1,000 acres of total reclamation including previously disturbed area), which would provide a post-mining surface condition that would be consistent with the expected long-term land uses, including wildlife habitat, livestock grazing, and possible future mining-related activities. In addition, there may be opportunities to utilize infrastructure at the Project for future industrial use. The Proposed Action would not result in impacts or changes to land ownership within the area of analysis, and the Project would not result in conflicts, substantial modifications or termination of the ROWs or land use authorizations within the area. MMI is proposing to substantially reduce overall traffic generation from the Project by utilizing passenger vans to transport personnel to the mine site. Impacts from traffic generations associated with the Project is anticipated to be short-term, regional, and minor, and is not anticipated to degrade the integrity of the road network utilized for access to the Project. MMI would maintain Three Bars Road and Roberts Creek Road in coordination with Eureka County. No dewatering is anticipated.

Native American Cultural Concerns

There are no specific goals identified related to specifically to Native American Cultural Concerns, in the Eureka County Master Plan, however, cultural resources are included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element as a topic along with historic and paleontological resources. For these resources, the defined goal is that *in coordination with federal state and local government planning agencies, tribal leadership and interested members of the public, determine the significance of cultural resource sites according to condition, content and relevance and increase the opportunity for educational, recreational, socio-cultural, and scientific uses of cultural and Paleontological resources.*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Any adverse impacts to NRHP eligible cultural sites would be avoided. If avoidance is not feasible, measures to minimize or mitigate effects would be proposed in accordance with a MOA and detailed in a HPTP developed in coordination with the SHPO. With implementation of the MOA, impacts from the Project are anticipated to be localized, short-term, and would result in no adverse effect. To date, no Traditional Cultural Property, property of traditional religious cultural

importance, or sacred site has been identified by the tribe or bands participating in the government-to-government consultation process or through cultural resources inventories.

Paleontological Resources

Paleontological resources are included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element as a topic along with historic and cultural resources. For these resources, the defined goal is that *in coordination with federal state and local government planning agencies, tribal leadership and interested members of the public, determine the significance of cultural resource sites according to condition, content and relevance and increase the opportunity for educational, recreational, socio-cultural, and scientific uses of cultural and Paleontological resources.*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Mining conducted in the Proposed Action would blast, remove, and crush the host formations for vertebrate and invertebrate fossils. Project EPMs for Paleontological Resources provide protection of the resource in the event of discovery during the Proposed Action, and thereby minimizes impacts to the resource through cessation of work until notice to proceed is issued by an Authorized Officer. Impacts would be permanent, localized, and negligible to minor.

Recreation

Hunting, Fishing, and Outdoor Recreation is included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element as a topic. Outdoor recreation, along with mining and agriculture is a key component of Eureka County's economy. The Eureka County Master Plan includes goals and policies for recreational opportunities (including hunting, fishing, and outdoor recreation), wilderness and wilderness study areas (WSAs). The primary goal relating to recreation within the Eureka County Master Plan is:

- *Provide for multiple recreation uses on Eureka County federal and state administered lands located within its boundaries for residents and visitors to the County. Provide recreational uses including high quality recreational opportunities and experiences at developed and dispersed/undeveloped recreation sites by allowing historic uses and access while maintaining existing amenities and by providing new recreation sites for public enjoyment. Pursue increased public access opportunities in both motorized and non-motorized settings through the acquisition of rights-of-way or easements across federal administered lands and private lands at the invitation of the property owner. Recognize that multiple recreation uses are mandated by the multiple use concepts and that adequate outdoor recreation resources must be provided on the federal administered areas; keeping open all existing access roads and the ability to maintain those same roads or accesses.*

The primary goal for wilderness areas and WSAs is:

- *Seek immediate Congressional designation action on all WSAs and other restrictive land classifications based on Eureka County policy to release these areas for multiple use management and in the interim prevent, minimize or mitigate impairment or degradation of such areas to the extent that Congressional actions are not pre-empted. Provide the*

amenities promised by wilderness designation through multiple use management that includes dispersed recreation where appropriate and opportunities for solitude

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Implementation of the Proposed Action mining and processing facilities would result in the loss of recreation opportunities within the 127 acres that would be fenced within the Project area for the life of mining operations. However, there would be no perimeter fencing around the Plan boundary that would preclude recreation use in other areas within the Plan boundary that are not actively being mined. Areas of active mining would restrict access for recreation activities for the life of mining operations, but the Proposed Action would reclaim approximately 420 acres of existing disturbance within the Plan boundary, which would be a positive impact in the long-term on recreation in the area. Adverse impacts from the Project on recreation in the area is anticipated to be short-term, localized, and minor.

Social and Economic Values

Social and economic values are addressed in several Elements in the Eureka Master Plan. Defined goals and objectives related to economic values are covered above under the key resources that compose the majority of Eureka County's economy: Livestock Grazing, Mining (Geology and Minerals), and Recreation, as well as Land Use, Access, Realty, and Transportation.

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Operation of the Project would result in employment levels of approximately 135 workers for the life of mining operations, and 101 jobs from indirect and induced employment. It is anticipated that the rental vacancy rate in the Eureka vicinity would be sufficient to accommodate the expected Project-related demand. Construction of the mine would have a short-term, localized, moderate, positive short-term fiscal effect for Eureka County, and operation and maintenance of the mine would have a long-term, minor positive fiscal effect for the life of the Project for Eureka County. These effects would effectively cease at the time the Project is completed and reclaimed.

Soils

Soils are included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element. Soils are included as a primary resource with vegetation and watersheds. The defined goal for the primary resources of soil, vegetation, and watersheds, is *to maintain or improve the soil, vegetation and watershed resources in a manner that perpetuates and sustains a diversity of uses while fully supporting the custom, culture, economic stability, and viability of Eureka County and its individual citizens*. Additionally, Eureka County supports mining that *uses the best available science and technology to ensure adequate protection of land, air, and water resources*.

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Disturbed areas would be subject to wind and water erosion until stabilizing vegetation becomes established. Project EPMs and concurrent reclamation, where practicable, would help reduce

wind and water erosion impacts. Mining and construction activities would impact the productivity and fertility of newly disturbed soils by mixing and compaction of the soils during salvage operations. However, there is nearly 654 acres of existing mine related disturbance within the Plan boundary from previous operators that is already impacting soil quality. The Proposed Project would reclaim approximately 420 acres of this existing disturbance, which may help overall soil productivity. Overall, adverse impacts to soils are expected to be long-term, localized, and minor to moderate over the life of the mine and after life of the mine.

Vegetation

Vegetation Resources are included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element. Vegetation is included as a primary resource with soil and watersheds. The defined goal for the primary resources of soil, vegetation, and watersheds, is *to maintain or improve the soil, vegetation and watershed resources in a manner that perpetuates and sustains a diversity of uses while fully supporting the custom, culture, economic stability, and viability of Eureka County and its individual citizens*.

Specifically, objectives relative to vegetation resources for this topic is to *prevent the introduction, invasion or expansion of undesirable plants and noxious weeds into native rangelands and improve the ecological status of sites that are currently invaded by undesirable plants or noxious weeds by integrating, through consultation with the Eureka County Weed District and Eureka County Department of Natural Resources, appropriate control methods into all planning efforts. Prescriptions for control of undesirable plants and noxious weeds may include, but are not limited to burning, grazing, mechanical, manual, biological and chemical methods* and *include with fire line and site rehabilitation plans, identification, utility and limitations of native or exotic vegetation capable of supporting watershed function and habitat for wildlife and livestock*.

In addition, an objective associated with goals for Growth Management indicates that *Eureka County encourages development which minimizes impacts to sensitive environmental areas.* Eureka County supports mining that *uses the best available science and technology to ensure adequate protection of land, air, and water resources*.

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: The Proposed Action would disturb 718 acres of previously undisturbed vegetation communities. Fourteen percent of the total disturbance from the Proposed Action would remain after mine closure; the remaining 86 percent would be reclaimed which would re-establish vegetation communities to a productive level, including for livestock grazing. Indirect impacts to vegetation communities would include the potential for the spread and introduction of noxious weeds and non-native invasive species; however, concurrent reclamation would occur, where practicable, and Project EPMs and MMI's Noxious Weed Plan would help reduce impacts from the spread and introduction of noxious and non-native invasive species. Overall impacts to vegetation communities would be long-term, localized, and minor.

Water Quality and Quantity

The Water Resources Element describes Eureka County's goals and planning guidance for water resources within Eureka County. Eureka County Code 9.30.060(C) states that *Eureka County would continue to work to maintain its water resources in a condition that will render it useable by future generations for the full range of beneficial uses that further a viable and stable economic and social base for its citizens* (Eureka County, 2010). Defined goals include meeting *the requirements for water quality contained in the Nevada Administrative Code (NAC) Section 445, to the extent they can be met while complying with constitutional and statutory law as to vested water rights, maintain or improve riparian areas and aquatic habitat that represents a range of variability for functioning condition.* Additionally, Eureka County supports mining that *uses the best available science and technology to ensure adequate protection of land, air, and water resources*.

Eureka County Commissioners have also adopted the 2016 Eureka County Water Resources Master Plan (Eureka County, 2016). The primary purpose of the Eureka County Water Resources Master Plan is to provide more details of guidance to implement the Eureka County Master Plan Water Resources Element. The goal of the Water Resource Master Plan arises from this guidance of the Water Resources Element of the Master Plan and is*, tempered by input from its residents, and is, quite simply, to provide sufficient information to its residents to help them develop the County's water resources in a manner that the resource can be used in perpetuity.* The document is organized to provide detailed information of water resources related issues facing Eureka County, including water rights, groundwater resources, surface water resources, current water usage, water quality, ability for growth within Eureka County communities, floodplain management, and provides potential management alternatives. Objectives include:

1) *Quantify the water resources available for use in the 16 hydrographic areas which comprise the County's Water Resource Master Plan planning area.*

2) *Estimate the amount of water which is currently being consumed within the planning area.*

3) *Identify areas where water use currently exceeds the supply or may someday outstrip supply if all approved water rights were to be put to beneficial use.*

4) *Estimate how much water may be available for future growth and provide insight as to where these supplies might be developed.*

5) *Identify the issues that might affect water supplies within the County and help residents recognize how these issues might affect them. These concerns may be related either to water quantity or water quality.*

6) *Raise residents' awareness of the potential threat from flooding within the County.*

7) *Ensure that water and water resource related management actions are consistent with Eureka County plans, policies, and desires through local, grass-roots planning and management of the water resources within Eureka County.*

8) *Help stakeholders identify, evaluate and implement management strategies to address water resource issues.*

9) *Coordinate with the Nevada Division of Water Resources, other federal, state and local agencies (e.g., Eureka Conservation District), the Central Nevada Regional Water Authority, and the Humboldt River Basin Water Authority, to efficiently manage the resource to the benefit of all stakeholders in a manner consistent with County plans and policies and the letter of the applicable laws.*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Project-related impacts may occur from erosion and sedimentation; however, the Project's stormwater control design, erosion specific EPMs and Best Management Practices would reduce impacts to surface waters from erosion. Under the maximum pumping scenario, the 10-foot drawdown isopleth would extend up to two miles from the pumping wells and drawdown at the Roberts Creek Ranch well would be around 25 feet. A 99 percent recovery of groundwater levels are anticipated within two years after cessation of pumping. The Non-Designated waste rock would be placed in one of the nine waste rock disposal areas developed for this type of waste, and all Designated waste would be placed in the Designated Waste Cell in the Pick East Lower Dump. The heap leach pad would be designed as a zero discharge facility in accordance with NAC guidelines. Impacts to surface water, groundwater, and geochemistry are anticipated to be long-term, regional, and negligible.

Wildlife

Wildlife is included in the Eureka County Master Plan Natural Resources & Federal or State Land Use Element. The Eureka County Master Plan identifies the following goal for wildlife and wildlife habitat: *Maintain, improve or mitigate wildlife impacts to habitat in order to sustain viable and harvestable populations of big game and upland game species as well as wetland/riparian habitat for waterfowl, fur bearers and a diversity of other game and nongame species.* A relevant objective is to *include considerations of wildlife habitat requirements in the design and reclamation of mineral development projects through approved Plan(s) of Operations*.

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: The Proposed Action would disturb three types of wildlife habitat; curl-leaf mountain mahogany, pinyon-juniper woodland, and sagebrush steppe. This would reduce habitat and forage area for various wildlife species, migratory birds and raptors. However, the Proposed Action would reclaim over 86 percent of the total disturbance associated with the Project, which includes approximately 395 acres of existing mine related disturbance from previous operators, which would be a benefit for wildlife habitat in the area. Impacts from the Proposed Action on wildlife, and their habitat from is anticipated to be long-term, localized, and minor.

Wild Horses

Wild Horses are not a specific topic in the Eureka County Master Plan but are considered under livestock grazing, water quality, soils, vegetation, and wildlife and wildlife habitat topics. Specific goals that may be relevant to this resource include: *to maintain or improve the soil, vegetation*

and watershed resources in a manner that perpetuates and sustains a diversity of uses while fully supporting the custom, culture, economic stability and viability of Eureka County and its individual citizens.

Specific objectives related to wild horses include: *manage wild horse and burro populations within HMAs at levels that preclude adverse impacts to soil, water and vegetation until monitoring studies and allotment evaluations demonstrate that population adjustments are warranted by changing resource conditions; develop and implement a management plan for wild horses, livestock and wildlife to minimize surface disturbance and erosion adversely affecting riparian areas;* and *provide for the development and maintenance of water conveyance systems (i.e. provide for livestock watering systems, irrigation diversions, and domestic or municipal uses).*

Proposed Action Implications on Eureka County Goals, Objectives, and Policies: Direct impacts of the Proposed Action to wild horses include loss of habitat, a reduction in forage availability, and possible mortality or injury from vehicle collisions. Changes to wild horse distribution and use patterns may occur. Project impacts are anticipated to be moderate and localized within the immediate Project area, but minor on the regional herd management area scale. The habitat is not highly valuable to wild horses due to pinyon and juniper cover, terrain and the existing disturbance from previous mining, and though wild horses move through the area, there is likely little reliance on the area for forage.

APPENDIX C
KEY OBSERVATION POINTS (KOPS)

KOP 1 NNW - Existing Conditions

KOP 1 NNW - Final Buildout

KOP 1 NNW – Post Reclamation

KOP 1 NNE - Existing Conditions

KOP 1 NNE – Final Buildout

KOP 1 NNE – Post Reclamation

KOP 2 NNW - Existing Conditions

KOP 2 NNW – Final Buildout

KOP 2 NNW – Post Reclamation

KOP 2 NNE - Existing Conditions

KOP 2 NNE – Final Buildout (No Change)

KOP 2 NNE – Post Reclamation (No Change)

KOP 3 NNW - Existing Conditions

KOP 3 NNW – Final Buildout

KOP 3 NNW – Post Reclamation (No Change)

KOP 3 NNE - Existing Conditions

KOP 3 NNE – Final Buildout

KOP 3 NNE – Post Reclamation

KOP 4 SW - Existing Conditions

KOP 4 SW – Final Buildout (No Change)

KOP 4 SW – Post Reclamation (No Change)

APPENDIX D
BLM FORM 8400-4 FOR EACH KEY OBSERVATION POINT

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: November 20, 2015
District: Battle Mountain
Resource Area:
Activity (program): Minerals

SECTION A. PROJECT INFORMATION

1. Project Name: Gold Bar EIS
2. Key Observation Point: KOP 1: Northeasterly Viewing Angle
3. VRM Class: Class IV
4. Location
   Township: 22N
   Range: 50E
   Section: 25
5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Wide flat valley; Roberts Mtns have a jagged & rugged form with weak triangular forms; bold flat road form	Small, globular shrubs; flat large block form farther in FM zone; large masses & irregular forms in background	Building with rectangular form; fence posts w/ thin vertical forms
LINE	No distinct lines in the FM zone; strong silhouette line of mtns against sky; strong curvilinear road	Subtle horizontal lines by variation in color of vegetation.	Building with short straight lines; fence posts with vertical short lines
COLOR	Light tan in the FM zone; rich brown and gray road	Gray & very pale green shrubs; dark green & olive forest. Ash gray low chroma in distant background	Buildings are brown and pale colors with silver roofs; fence posts that are dark brown
TEXTURE	Clumped soil between shrubs; finely stippled road surface	Coarse dense shrubs; Uniform and finely stippled shrubs.	No discernible texture

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Very thin; nearly rectangular	None	None
LINE	None		
COLOR	Dark gray and brown		
TEXTURE	Coarse		

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			X					X				X
Line				X				X				X
Color			X					X				X
Texture			X					X				X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: George Dix, Stantec
Date: Feb. 2, 2017

Rel. 8-30
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: November 20, 2015
District: Battle Mountain
Resource Area:
Activity (program):

SECTION A. PROJECT INFORMATION

1. Project Name: Gold Bar EIS
2. Key Observation Point: KOP 1: Northwesterly Viewing Angle
3. VRM Class:
4. Location
   Township: 22N
   Range: 50E
   Section: 25
5. Location Sketch:

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Wide, flat valley floor. Weak conical and triangular forms of descending ridge lines; thin long road; irregular mine	Small globular shrubs; large, flat block form of more distant shrubs; large masses and irregular forms on mountains	No structures
LINE	Smooth rolling silhouette line of mtns and sky. Thin diagonal line from road	Subtle horizontal lines from color variation in shrub vegetation	No structures
COLOR	Brown soils between shrubs; white snow on high peaks; light tan road; light tan, gray & orange mine	Gray and very pale green shrubs; very dark green and olive on mountains - ash gray farthest from KOP	No structures
TEXTURE	Coarse soils close to KOP	Coarse dense shrubs; uniform, finely stippled shrubs,	No structures

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Trapezoidal shape; somewhat rounded; very thin & low	Somewhat retaining trapezoidal shapes	None
LINE	Curving, nearly straight & horizontal; short diagonal lines; irregular silhouette	None	
COLOR	Gray; brown; dark brown	Green and tan (post-reclamation)	
TEXTURE	Coarse	Coarse	

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form		X				X						X
Line		X				X						X
Color	X						X					X
Texture			X				X					X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: George Dix, Stantec
Date: Feb 2, 2017

Rel. 8-30
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: November 20, 2015
District: Battle Mountain
Resource Area:
Activity (program):

SECTION A. PROJECT INFORMATION

1. Project Name: Gold Bar EIS
2. Key Observation Point: KOP 2: Northeasterly Viewing Angle
3. VRM Class: Class IV
4. Location
   Township: 20 N
   Range: 51 E
   Section: 35
5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently rolling hills; wide flat valley floor; large triangular to conical mountains; thin horizontal form on valley floor	Bold spherical trees; small globular shrubs; sparse spiked grass; flat block shrub masses; irregular form on mountains	Simple, short fence posts
LINE	Sharp prominent lines along crests of low rolling hills; sharp straight line in valley, strong and weak flowing silhouette lines	Sharp straight line where vegetation meets bare soils in valley.	Straight & vertical
COLOR	Dark grey and brown road surface; gray and white snow; light tan to off-white bare soil	Dark green; brown and dark gray; dark green to very dark gray; light tan	Dark brown
TEXTURE	Coarse & uniform road surface	Uniform and finely stippled	No discernible texture

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	None visible	None visible	None visible
LINE			
COLOR			
TEXTURE			

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS: Form				X				X				X
Line				X				X				X
Color				X				X				X
Texture				X				X				X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: George Dix, Stantec
Date: Feb. 2, 2017

Rel. 8-30
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: November 20, 2015
District: Battle Mountain
Resource Area:
Activity (program): Minerals

SECTION A. PROJECT INFORMATION

1. Project Name: Gold Bar EIS
2. Key Observation Point: KOP 2: Northwesterly Viewing Angle
3. VRM Class: Class IV
4. Location
   Township: 20 N
   Range: 51 E
   Section: 35
5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Prominent, large and irregular; wide and flat; contrasting linear form; jagged and irregular forms; weak triangle	Bold spherical form; very small circular forms; irregular shaped patches; low sparse and spiked; large flat block form	Thin & vertical
LINE	Strong curvilinear; strong irregular silhouette line	Subtle horizontal lines	Straight lines; bold horizontal and vertical lines
COLOR	Light tan to nearly white; gray and pale brown	Dark green; very dark gray; light tan; pale green to gray; low chroma	Brighter red; yellow
TEXTURE	Distinct finely stippled	Random and even; uniform and finely stippled	No texture

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	None discernible	None discernible	None discernible
LINE			
COLOR			
TEXTURE			

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form				X				X				X
Line				X				X				X
Color				X				X				X
Texture				X				X				X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: George Dix, Stantec
Date: Feb 2, 2017

Rel. 8-30
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: November 20, 2015
District: Battle Mountain
Resource Area:
Activity (program): Minerals

SECTION A. PROJECT INFORMATION

1. Project Name: Gold Bar EIS
2. Key Observation Point: KOP 3: Northeasterly Viewing Angle
3. VRM Class: Class IV
4. Location
   Township: 21 N
   Range: 50 E
   Section: 3
5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat & regular (valley); rolling and rounded (foothills); bold, rough and steep (peaks)	Small and round (shrubs); complex and irregular (shrubs); large strip shaped form; spherical (trees); irregular	No structures
LINE	Curving and somewhat smooth silhouette; strong flowing silhouette; strong jagged silhouette	No discernible lines	No structures
COLOR	Orange-brown to brown	Pale green to blue-green; green and olive green; dark green to very dark gray; light tan; white snow	No structures
TEXTURE	No discernible textures	Coarse dense; uneven and random	No structures

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Thin & irregular; trapezoidal	None	None
LINE	Straight horizontal		
COLOR	Dark gray & brown; light brown		
TEXTURE	Indistinguishable		

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			X					X				X
Line			X					X				X
Color				X				X				X
Texture				X				X				X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: George Dix, Stantec
Date: Feb 2, 2017

Ref: 8-30
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: November 20, 2015
District: Battle Mountain
Resource Area:
Activity (program): Minerals

SECTION A. PROJECT INFORMATION

1. Project Name: Gold Bar EIS
2. Key Observation Point: KOP 3: Northwesterly Viewing Angle
3. VRM Class: Class IV
4. Location
   Township: 21 N
   Range: 50 E
   Section: 3
5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat and regular (valley); rolling and round (hills); jagged and irregular; weak triangular	Small and round (shrubs); complex and irregular (shrubs); large strip (shrubs); spherical (trees); irregular	No structures
LINE	Curving and smooth silhouette; strong irregular silhouette	No discernible line elements	No structures
COLOR	Orange-brown to brown	Pale green to blue-green; green and olive-green; low-chroma green and olive; light tan	No structures
TEXTURE	Fine (soils)	Coarse dense texture; uneven and random	No structures

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Thin and irregular	None	None
LINE	Irregular silhouette		
COLOR	Dark grey and brown		
TEXTURE	Indistinguishable		

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			X					X				X
Line			X					X				X
Color			X					X				X
Texture				X				X				X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names	Date
George Dix	Feb 2, 2017
Stantec	

Rel. 8-30
1/17/86

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: November 20, 2015
District: Battle Mountain
Resource Area:
Activity (program): Minerals

SECTION A. PROJECT INFORMATION

1. Project Name: Gold Bar EIS
2. Key Observation Point: KOP 4
3. VRM Class: Class IV
4. Location
   Township: 23N
   Range: 50E
   Section: 35
5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Triangular peaks that are dominant and large. Block form flat area. Rock outcrops with irregular form	'Cone' shaped trees; strip form of willows & of sagebrush. Irregular forms from patches of grass	No structures
LINE	Zig-zag silhouette along top of peaks	Irregular & Jagged line along top of willow strip & along top of sagebrush strip	No structures
COLOR	Light gray & light brown rock outcrops; gray road surface	Dark green conifers with black shadows; bright green aspens; brilliant green & pale green shrubs; gray-green shrubs; Green grasses	No structures
TEXTURE	Rough and uneven rocks; very finely stippled road surface	Coarse & uniform willows & sagebrush; Coarse and rough conifers	No structures

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	None visible	None visible	None visible
LINE			
COLOR			
TEXTURE			

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS: Form				X				X				X
Line				X				X				X
Color				X				X				X
Texture				X				X				X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: George Dix, Stantec
Date: Feb 2, 2017

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APPENDIX E
BLM SENSITIVE SPECIES LIST

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)
		PLANTS	
Eastwood milkweed	*Asclepias eastwoodiana*	NS	Open areas on a wide variety of basic soils (usually pH 8 or higher), including calcareous clay knolls, sand, carbonate, or basaltic gravels, or shale outcrops, generally barren and lacking competition, frequently in small washes or other moisture-accumulating microsites, in the shadscale, sagebrush, and low pinyon-juniper zones. Elevation range is between 4,680 feet and 7,080 feet (NNHP, 2001).
Cima milkvetch	*Astragalus cimae* var. *cimae*	NS	Dry, open, relatively barren calcareous gravel slopes or clay hills at elevations of 5,100 to 6,420 feet. Known from northwestern Mineral County and central Nye County, and in California (NNHP, 2001).
Tonopah milkvetch	*Astragalus pseudiodanthus*	NS	Deep loose sandy soils of stabilized and active dune margins, old beaches, valley floors, or drainages, with greasewood (Sarcobatus vermiculatus) and other salt desert shrub taxa. Dependent on sand dunes or deep sand in Nevada, 4,320-5,920 feet (NNHP, 2001; Barneby et at., 1989).
Toquima milkvetch	*Astragalus toquimanus*	NS	Dry, stiff, sandy to gravelly, generally somewhat basic or calcareous soils in single-leaf pinyon(*Pinus monophylla), Utah* juniper (*Juniperus osteosperma*), and/or Artemisa communities, mostly on flats or gentle slopes, frequently growing under or up through shrubs. Central Nye County. Elevation range 6,480 to 7,520 feet (NNHP, 2001).
Currant milkvetch	*Astragalus uncialis*	NS	Dry, open, sparsely vegetated, calcareous sandy-clay soils on flats and gentle slopes of hillsides and alluvial fans. Northeastern Nye County. Elevation range 4,800 to 6,050 feet (NNHP, 2001).
Elko rockcress	*Boechera falcifructa*	NS	Dry, densely vegetated, relatively undisturbed, light-colored silty soils with a high cover of moss and other soil crust componensts on moderate to steep north-facing slopes in the sagebrush zone, dominated by moss, Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis* , yellow rabbitbrush (*Chrysothamnus viscidiflorus* var. *puberulus)* , and Sandberg bluegrass (*Poa secunda* var. *secunda*). Also reported but not confirmed from rock crevices. Elko and Lander counties. Elevation range 4,800 to 6,050 feet (NNHP, 2001). Lander County occurrence is a disjunct population in the Shoshone Mountains (Holmgren et al., 2005).
Monte Nevada paintbrush	*Castilleja salsuginosa*	NS	Damp, open, alkaline to saline clay soils of hummocks and drainages on travertine hot spring mounts with greasewood (*Sarcobatus vermiculatus)* , rubber rabbitbrush (*Chrysothamnus nauseosus)* , alkali sacaton (*Sporobolus airoides)* , etc. Aquatic or wetland dependant. Eureka and White Pine counties. Elevation range 5,965 to 6,130 feet. (NNHP, 2001).
Tecopa birdbeak	*Cordylanthus tecopensis*	NS	Open, moist to saturated, alkali-crusted clay soils of seeps, springs, outflow drainages, and meadows, with desert saltgrass (*Distichlis spicata)* , baltic rush (*Juncus balticus)* , *Eleocharis* , Ash Meadows lady's tresses (*Spiranthes infernalis)* , spring-loving centaury (*Centaurium namophilum)* , *Typha* , *Cirsium* , Ash Meadows ivesia (*Ivesia kingii var. eremica*), white flowered rabbitbrush (*Ericameria albida)* , etc. Dependant on wetland margin areas in Nevada. In Nevada, known only from the Ash Meadows area and Fish Lake Valley. Elevation range 2,100 to 4,900 feet (NNHP, 2001)
Goodrich biscuitroot	*Cymopterus goodrichii*	NS	Moderate to steep scree and talus slopes of dark angular slate or limestone in the upper subalpine zone and lower alpine zone. Lander, Nye and Pershing counties. Elevation range 7,300 to 11,100 feet (NNHP, 2001). Toiyabe Range in Lander County and Humboldt Range in Pershing County (Cronquist et al., 1997).
Nevada willowherb	*Epilobium nevadense*	NS	Slopes with limestone outcrops or talus at 6,000 to 8,930 feet elevation. Associated with *Pinus monophylla* and *Pinus ponderosa* (NNHP, 2001). Clarka, Esmeralda and Lincoln counites. Also in Utah.
Windloving buckwheat	*Eriogonum anemophilum*	NS	Generally high elevation dry, exposed, relatively barren ridges and knolls on shallow soils over bedrock from 4,750 to 9,840 feet (NNHP, 2001; Reveal, 2005).Volcanic greenstone, tuffaceous clayey or gravelly to rocky (often limestone) outcrops in saltbrush and sagebrush communities and in pinyon-juniper woodlands (Holmgren et al. 2012).
Beatley buckwheat	*Eriogonum beatleyae*	NS	Dry volcanic outcrops at elevations between 5,600 and 8,745 feet (NNHP, 2001). Granitic or volcanic slopes and ridges in sagebrush communities, and in pinyon-juniper, montane and alpine conifer woodlands (Holmgren et al., 2012) Note: Holmgren et al. (2012) treat E. beatlleyae as a variety of E. rosense.
Tiehm buckwheat	*Eriogonum tiehmii*	FC; SE; NS	Dry, open, relatively barren, light-colorerd rocky clay soils derived from a formation of interbedded claystones. Shales, tuffaceous sandstones and limestones, on all aspects with slopes up to about 50 percent, in pure stands or with a sparse cover of Atriplex confertifolia, Pleuraphis jamesii, Sporobolis aeroides, and a few other species. Endemic to a very small area of the Silver Peak Range. Elevation range 5,960 to 6,300 feet (NNHP, 2001).
Sand cholla	*Grusonia pulchella*	SP, NS	Sandy to rocky flats, often in sandy areas from 3,800 to 5,000 feet ; throughout most of Nevada (NNHP, 2001; Pinkava, 2003). Sandy to rocky flats or slopes, often at edges of dry washes and lakes (Holmgren et al., 2012)

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)
Lunar Crater buckwheat	*Johanneshowellia crateriorum*	NS	Local and usually common on sandy, pumice flats in saltbrush communities. Endemic, Lunar Crater area, Nye County. Elevation Range 5,580 to 6,000 feet. (Holmgren et al. 2012; Reveal, 2004).
Holmgren lupine	*Lupinus holmgrenanus*	NS	There is question of whether *Lupinus holmgrenanus* should be considered part of large leaf lupine (*Lupinus polyphyllus* var. *humicola*) (as in Cronquist et al., 1989), while the Jepson Manual (Hickman, 1993; Balwin, 2012) and Kartesz (1999) treatments maintain it as a distinct species. Cronquist et al. (1989) state the range of *L. holmgrenanus* is the north edge of the Mojave Desert near Silver Peak in Esmeralda County.
Low feverfew	*Parthenium ligulatum*	NS	Barren clay or sandy-clay slopes and flats in the pinyon-juniper community. Elevation Range 5,580 to 7,050 feet (Cronquist et al., 1994). Known from two counties in Colorado, six counties in Utah (Welsh et al. 1993) and Eureka County, Nevada. This species has been falsely reported from Wyoming (WYNHP, 1998)
Pahute Mesa beardtongue	*Penstemon pahutensis*	NS	"In loose soil and rock crevices among boulders in pinyon-juniper woodlands and sagebrush shrublands" (NNHP 2001). Esmeralda and Nye counties. Elevation range 5360 to 8240 feet (NNHP, 2001).
Lahontan beardtongue	*Penstemon palmeri* var. *macranthus*	NS	Along washes, roadsides and canyon floors, particularly on carbonate-containing substrates, usually where subsurface moisture is available throughout most of the summer. Unknown if restricted to carbonate substrates. Elevation range 3,430 to 4,550 feet. (Cronquist et al., 1984; NNHP, 2001).
Bashful beardtongue	*Penstemon pudicus*	NS	Crevices, soil pockets, and coasrse rocky soils of felsic volcanic outcrops, boulder piles, steep protected slopes, and draiange bottoms, mostly onnorth and east aspects, in the subalpine sagebrush, mountain manhogany and upper pinyon juniper zones. Nevada Endemic, central Nye County. Elevation range 7,500 to 9,000 feet (NNHP, 2001).
Tiehm beardtongue	*Penstemon tiehmii*	NS	Neutral sandy-loam pockets on steep, southerly-facing volcanic talus and scree slopes. Narrow endemic, known only from one mountain peak, Shohone Mountains, Lander County, Nevada. Elevation range 7,500 to 9600 feet (NNHP, 2001).
Clarke phacelia	*Phacelia filiae*	NS	Mostly barren outcrops and silty to clay, often gypsiferous soils derived from white to pinkish volcanic tuff in the creosote-burr sage, shadscale, mixed-shrub, and blackbrush zones, often associated with shadscale saltbush (*Atriplex confertifolia*). Nevada endemis, Clarfk, Nye and possibly Lincoln counties. Elevation range 3,40 to 5,820 feet (NNHP, 2001).
Williams combleaf	*Polyctenium williamsiae*	SE; NS	Relatively barren sandy to sandy-clay or mud margins and bottoms of non-alkaline seasonal lakes perched over volcanic bedrock in the sagebrush, pinyon-juniper, and mountain sagebrush zones, with Douglas' sedge (*Carex douglasii*), Mat muhly (*Muhlenbergia richardsonis*), tansyleaf evening primrose (*Camissonia tanacetifolia*), povertyweed (*Iva axillaris*), tiny mousetail (*Myosurus minimus*), Newberry's cinquefoil (*Potentilla newberryi*), short woollyheads (*Psilocarphus brevissimus*), *Downingia* sp., *Eleocharis*, Baltic rush (*Juncus balticus*), big sagebrush (*Artemisia tridentata*), *A. cana*, etc. Aquatic or wetland-dependent in Nevada. Elevation range reported is 5,670 to 8,930 feet (NNHP, 2001).
Blaine pincushion	*Sclerocactus blainei*	NS	Alkaline calcareous and volcanic gravelly-clay soils in open valley bottom ares in the shadacale and lower sagebrush zones with greasewood (*Sarcobatus vermiculatus*), James; galleta (*Pleuraphis jamseii)*, shadscale saltbush (*Atriplex confertifolia)*, big sagebrush (*Artemisia tridentata)*, rubber rabbitbrush (*Ericameria nauseosa*), etc. Nye county, Nevada. Possibly Nevada endemic. Elevation ragne 5,100 to 5,300 feet (NNHP, 2001).
Tonopah pincusion	*Sclerocactus nyensis*	NS	Dry rocky soils and low outcrops of rhyolite, tuff, and possibly other rock types, on gentle slopes in open areas or under shrubs in the upper salt desert and lower sagebrush zones. Nevada endemic, Esmeralda and Nye counties. Elevation range 5,760 to 5800 feet (NNHP, 2001).
Railroad Valley globemallow	*Sphaeralcea caespitosa* var. *williamsiae*	NS	Known from at least six occurrences covering fairly extensive acreage in Nye County, Nevada. It occurs on federal, state, and private lands (NNHP, 2001).
Lone Mountain goldenhead	*Tonestus graniticus*	NS	Crevices of granitic cliffs and outcrops on protected exposures (north to east aspects, deep canyons, etc. in the pinyin-juniper zone. Esmeralda County. Elevation 7,800 feet (NNHP, 2001)
AMPHIBIANS			
Amargosa toad	*Bufo nelsoni*	NS	Endemic to Oasis Valley in Nye County, Nevada, specifically along a 10-mile stretch of the Amargosa River and nearby upland springs. The toads forage along the water's edge and upland areas during the night (AmphiaWeb, 2015).

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)
Columbia spotted frog	*Rana luteiventris*	FC, NS	Widely distributed throughout southwest Idaho, southeast Oregon, northeast and central Nevada, but most populations within this range appear to be small and isolated from each other (USFWS, 2012). Highly aquatic; rarely found far from permanent quiet water; usually occurs at the grassy/sedge margins of streams, lakes, ponds, springs, and marshes. May disperse into forest, grassland, and brushland during wet weather, and may traverse uplands to reach wintering sites. Uses stream-side small mammal burrows as shelter. Overwintering sites in the Great Basin include undercut stream banks and spring heads. Wintering sites in central Idaho included deep lakes. In general, they use the shallows of lentic habitats for breeding and egg deposition. These habitats are usually permanent, although naturally ephemeral pools are used successfully by some populations. Springs are often nearby. Floating and/or emergent vegetation is usually present. Percent sun exposure is typically high (AmphiaWeb, 2015).
		BIRDS	
Northern goshawk	*Accipiter gentilis* [1]	SS, NS	Nests in various forest types with a preference for taller, mature stands with significant canopy cover. Some pairs may remain near nests year-round. In Nevada, northern goshawks commonly nest in aspen "stringers" that border mountain streams and ephemeral drainages. Foraging habitat includes open sage-steppes to dense forests and riparian areas (Squires and Reynolds, 1997).
Western burrowing owl	*Athene cunicularia hypugaea* [1]	SP, NS	Uses a variety of habitats that are open, arid, and treeless with low vegetation. Most common where mammal burrows are available for nesting. Unlike breeding owls, wintering owls are not as dedicated to a single burrow or group of burrows. Will often breed near agricultural lands, golf courses, and roadsides, but will not tolerate highly disturbed areas.
Ferruginous hawk	*Buteo regalis* [1]	SP, NS	Inhabits open country including grasslands and shrublands, while avoiding forests, steep terrain, and high elevations. Most likely to be found in sagebrush scrub, but may also occur in salt desert scrub and sagebrush steppe. May also be associated with pinyon-juniper blocks. In Nevada, often nests in juniper edge habitat bordering open valleys. Ferruginous hawks prey heavily on ground squirrels. Because their principal prey (ground squirrels) enters aestivation by late July or early August, ferruginous hawks typically fledge young and leave the area by early August (Montana, 2012; GBBO, 2010).
Swainson's hawk	*Buteo swainsoni* [1]	SP, NS	Uses open grasslands and shrublands, and is well adapted to agricultural areas. Typically nests in scattered trees near open areas that are used for foraging (Bechard, 2010). Usually nests in junipers in the Great Basin.
Greater sage-grouse	*Centrocercus urophasianus* [1]	FC, GS, NS	Associated with sagebrush steppe habitats that include bunchgrass and forb components. During the breeding season sage-grouse congregate on historic open sites known as leks where males display and attempt to attract females. Nesting habitat is generally adjacent to lek sites and is comprised of denser brush canopy for concealment of nests, while brood-rearing and summer habitat encompasses sagebrush and meadow interfaces or other habitats, which supply a diversity of forbs and insects consumed by growing chicks. The majority of the year sage-grouse feed on sagebrush (Schroeder et al., 1999; GBBO, 2010). Will move substantial distances to use seasonally appropriate microhabitats.
Western snowy plover	*Charadrius alexandrinus nivosus*	SP, NS	Nests on the ground on broad open beaches or salt or dry mud flats, where vegetation is sparse or absent (Page, 2009). In Nevada, they generally require hypersaline playas with minimum vegetation (GBBO, 2010).
Peregrine falcon	*Falco peregrinus* [1]	SE, NS	May be found in a variety of habitat types. Known nest sites in Nevada have been located on cliff ledges or high buildings. Nests in Nevada generally near lakes, wetlands, or river systems. These birds of prey are not commonly found in Nevada. They feed primarily on medium sized birds, but are known to sometimes forage on small mammals, lizards, fish, and insects (White et al., 2002; GBBO 2010).
Pinyon jay	*Gymnorhinus cyanocephalus* [1]	SP, NS	Nests and forages in pinyon-juniper woodland and may forage in other habitats such as sagebrush shrublands. Strongly associated with occurrence of pinyon pine. Pinyon jays are highly social, cooperative-breeding, seed-caching birds. Pinyon jays inhabit higher elevations of the Great Basin, commonly within pinyon-juniper woodlands with diverse age class distribution. They are the earliest of the passerines to breed, synchronously nesting in winter, depending on seed caches from the fall crop of pine seeds (Balda, 2002).
Bald eagle	*Haliaeetus leucocephalus* [1]	SE, NS	Usually nests in forests or tall trees near large water bodies. The bald eagle inhabits areas near water and feeds on fish and waterfowl, but also inhabits areas where other food such as rabbits and road kill is available (NatureServe, 2014). Bald eagle nests are most commonly built in trees. During winter months, eastern Nevada bald eagles roost in trees at ranches or on sagebrush in the valley bottoms (GBB0, 2010).

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)
Black rosy-finch	*Leucosticte atrata* [1]	SP, NS	Barren, rocky or grassy areas and cliffs in alpine tundra atop high mountains. Black rosy-finches are found in alpine settings (Alpine-scree ecotone in high elevation meadow, [WAPT, 2012]), breeding/nesting in cliffs overlooking glaciers and snowfields (Baicich and Harrison, 2005). Within Nevada they have been found nesting in the Ruby, Snake and Santa Rosa Mountain Ranges (Floyd et al., 2007). They are more commonly seen in the winter, when they may be found in open fields and cultivated lands in relatively large flocks feeding on seeds and insects. During the winter rosy-finches are known to roost in mine shafts, caves, barns and old cliff swallow nests (Johnson, 2002).
Lewis' woodpecker	*Melanerpes lewis*	SP, NS	Nests in open forest and woodland, often logged or burned, including oak, coniferous forest, riparian woodland, orchards, and pinyon-juniper. Primary habitat consists of burned coniferous woodlands and open riparian woodlands with a relatively intact grass or shrub understory. Lewis's woodpecker favors open forests, ranging in altitude from low-elevation riparian areas to higher-elevation burns and pine forests. Like all other woodpeckers, it requires snags (standing, dead or partly dead trees) for nesting, although it is not anatomically specialized for excavating in wood and the trees it selects for nesting are generally well decayed (Vierling et al., 2013). Northeastern Nevada Breeding Bird Atlas records for the species are concentrated in the Ruby, East Humboldt and Jarbidge mountain ranges (Floyd et al., 2007).
Sage thrasher	*Oreoscoptes montanus* [1]	SS, NS	Considered a sagebrush obligate and is commonly found in habitats of intact, fairly dense stands of sagebrush. Sage thrashers may also occur in greasewood or bitterbrush (Floyd et al., 2007). Sage thrashers situate their nests within dense brush or on the ground. They primarily feed on insects but occasionally eat berries (Reynolds et al., 1999).
Brewer's sparrow	*Spizella breweri* [1]	SS, NS	Strongly associated with sagebrush habitat including sagebrush scrub and sagebrush steppe. Also commonly found in salt desert scrub. May occur in most habitat types in Nevada. Brewer's sparrows nest in brush communities with low shrubs and grasses, and primarily feed on insects and seeds (Floyd, et al., 2007).
		FISH	
Railroad Valley springfish	*Crenichthys nevadae*	FT, SE	Thermal isolated springs and associated outflows. Their historic range was isolated to six thermal springs in Railroad Valley. They have since been intoduced outisde of this range into private ponds at Sodaville, Chimney Spring, and Warm Spring. Today, the species is presumed to only exist at six of these sites (USFWS, 2014)
Hot Creek Valley tui chub	*Gila bicolor ssp. 5*	NS	Tui chub species is widely distributed throughout the Great Basin Region, in much of the area of the historical Lake Lahontan and other pluvial lakes. The disappearance of these lakes isolated populations and now 13 subspecies have been recognized (Lovich).
Railroad Valley tui chub	*Gila bicolor ssp. 7*	NS	Tui chub species is widely distributed throughout the Great Basin Region, in much of the area of the historical Lake Lahontan and other pluvial lakes. The disappearance of these lakes isolated populations and now 13 subspecies have been recognized (Lovich).
Fish Lake Valley tui chub	*Gila bicolor ssp. 4*	NS	Tui chub species is widely distributed throughout the Great Basin Region, in much of the area of the historical Lake Lahontan and other pluvial lakes. The disappearance of these lakes isolated populations and now 13 subspecies have been recognized (Lovich).
Monitor Valley speckled dace	*Rhinichthys osculus spp. 5*	NS	Well oxygenated water with abundant cover of woody debris or overhanging banks along with moving water or wave action is essential for continued persistence. Prefers shallow riffle and channelized streams with some flow (WAPT, 2012). Only found in Monitor Valley.

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)
MAMMALS			
Pallid bat	*Antrozous pallidus* [1]	SP, NS	Arid deserts and grasslands, often near rocky outcrops and water. Less abundant in evergreen and mixed conifer woodland. Usually roosts in rock crevice or building, less often in cave, tree hollow, mine, etc. Prefer narrow crevices in caves as hibernation sites. Their primary food sources are arthropods such as crickets, grasshoppers, beetles, scorpions, and spiders. This species has been found between 1,380 to 8,465 feet (Bradley et al., 2006).
Pygmy rabbit	*Brachylagus idahoensis* [1]	GS, NS	Generally use burrows dug in the taller and denser big sagebrush in an area. May be found in broad valley floors, drainage bottoms, alluvial fans, and other areas with friable soils. May also occur in areas of large dense rabbitbrush and greasewood. Understory can vary from none to dense grasses and forbs. pygmy rabbit burrows are typically found in relatively deep, loose soils of wind- or water-born origin suitable for burrowing (USFWS, 2012; Utah DWR, 2003). Pygmy rabbits may occur in areas of shallower or more compact soils with sufficient shrub cover because abandoned burrows of other species may be utilized (USFWS, 2012).
Townsend's big-eared bat	*Corynorhinus townsendii* [1]	SS, NS	Maternity and hibernation colonies typically are in caves and mine tunnels. Prefers relatively cold places for hibernation, often near cave or mine entrances and in well ventilated areas. Uses caves, buildings, and tree cavities for night roosts. Throughout much of the known range, commonly occurs in mesic habitats characterized by coniferous and deciduous forests, but occupies a broad range of habitats. Habitats in the vicinity of roosts include pine forests, pinyon-juniper woodland, and cottonwood bottomland. The Townsend's big-eared bat is a moth specialist, the majority of its diet composed of Lepidopterans (BCI, 2015; Bradley et al., 2006).
Big brown bat	*Eptesicus fuscus*	NS	Various wooded and semi-open habitats, including cities. Much more abundant in regions dominated by deciduous forest than in coniferous forest areas. This species occurs in a variety of habitats, including pinyon-juniper, sagebrush, and agriculture (BCI, 2015; Bradley et al., 2006). Summer roosts generally are in buildings; also hollow trees, rock crevices, tunnels, and cliff swallow nests; prefers sites that do not get hot. Typically roosts in twilight part of cave. Maternity colonies form in attics, barns and occasionally tree cavities. Caves, mines, and especially buildings and man-made structures are used for hibernation. The big brown bat is considered a generalist in their foraging behavior and habitat selections, showing little preference for feeding over water, land, forests, or clearings (BCI, 2015). Their primary diet includes beetles and they usually forage within a few kilometers of their roost. This bat can be locally common in some urbanized environments (Bradley et al., 2006).
Spotted bat	*Euderma maculatum*	ST, NS	Found in various habitats from desert to montane coniferous stands, including open ponderosa pine, pinyon-juniper woodland, canyon bottoms, open pasture, and hayfields. Roosts in caves and in cracks and crevices in cliffs and canyons. Winter habits poorly known. Distribution is linked to availability of cliff roosting habitat (Bradley et al., 2006). Their primary diet consists of moths, with foraging occurring in canyons, in the open, or over riparian vegetation.
Western red bat	*Lasiurus blossevillii*	SS	Restricted to riparian habitats along the western and southern edges of Nevada. Found in wooded habitats, including mesquite bosque and cottonwood/willow riparian area (NDOW, 2015).
Silver-haired bat	*Lasionycteris noctivagans*	NS	Prefers forested (frequently coniferous) areas adjacent to lakes, ponds, and streams. During migration, sometimes occurs in xeric areas. Summer roosts and nursery sites are in tree foliage, cavities, or under loose bark, sometimes in buildings. Silver-haired bats typically roost in trees along forest borders (BCI, 2015). This species primarily feeds on small, soft-bodied insects (BCI, 2015).
Hoary bat	*Lasiurus cinereus*	NS	Prefers deciduous and coniferous forests and woodlands. Roosts usually in tree foliage 3-5 meters above ground, with dense foliage above and open flying room below, often at the edge of a clearing and commonly in hedgerow trees. Sometimes roosts in rock crevices, rarely uses caves in most of range. Hibernating individuals have been found on tree trunks, in a tree cavity, in a squirrel's nest, and in a clump of Spanish-moss. Solitary females with young roost among tree foliage. Primary food sources include beetles, moths, grasshoppers, dragonflies, and wasps (Bradley, 2006).
Dark kangaroo mouse	*Microdipodops megacephalus*	SP, NS	Inhabits stabilized sand dunes and other sandy soils in valley bottoms and alluvial fans dominated by big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus* spp.), and horsebrush (*Tetradymia* spp.) (WAPT, 2012). The species also occurs on fine gravelly soils (O'Farrell and Blaustein, 1974), or sandy soils with varying amounts of gravel (Hall, 1995; WAPT, 2012). This species typically occurs in sandy habitats below the elevation where pinyon-juniper occurs and above where greasewood and saltbush predominate (WAPT, 2012). Underground when inactive.

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)
Pale kangaroo mouse	*Microdipodops pallidus*	SP, NS	Habitat is nearly restricted to fine sands in alkali sink and desert scrub dominated by *Atriplex confertifolia* (shadscale) or *Artemisia tridentata* (big sagebrush). This mouse often burrows in areas of soft, windblown sand piled at the bases of shrubs. generally occurring within the west-central portion of the state (Hafner et al., 2008). Restricted to fine, loose, wind-blown sand (Hall, 1995) and sandy soils with little or no gravel overlay (WAPT, 2012).
California myotis	*Myotis californicus*	NS	Western lowlands; sea coast to desert, oak-juniper, canyons, riparian woodlands, desert scrub, and grasslands. Often uses man-made structures for night roosts. Uses crevices of various kinds, including those in buildings, for summer day roosts. May also roost on small desert shrubs or on the ground. Hibernates in caves, mines, tunnels, or buildings. May form small maternity colonies in rock crevices, under bark, or under eaves of buildings. These bats feed on moths, flies, and beetles, generally foraging in the open, along margins of tree clumps, and over water (Bradley et al., 2006; NatureServe, 2014).
Western small-footed myotis	*Myotis ciliolabrum* [1]	NS	This species of bat occurs west of the Rockies in varied habitats, most common in pinyon-juniper communities (Bogen, Valdez and Navo, 1998). Generally inhabits desert, badland, and semiarid habitats; more mesic habitats in southern part of range. Roosts in summer in rock crevices, caves, tunnels, under boulders, beneath loose bark, or in buildings. Hibernates in caves and mines. Maternity colonies often are in abandoned houses, barns, or similar structures.
Long-eared myotis	*Myotis evotis*	NS	This species is primarily found at higher elevations and is associated with coniferous forest (Bradley et al., 2006). In Northern Nevada, this species is common in pinyon-juniper communities and above, but has also been found in sagebrush and desert scrub habitats (Bradley et al., 2006). Roosting sites include beneath bark or within cavities, crevices in cliffs, hollow trees, and buildings. Foraging occurs along rivers and streams, over ponds, and within forests (Bradley et al., 2006).
Little brown myotis	*Myotis lucifugus*	NS	This species is found primarily at higher elevations and is associated with coniferous forests (Bradley et al., 2006). The species has adapted to using human-made structures for resting and maternity sites; also uses caves and hollow trees. Foraging habitat requirements are generalized; usually forages in woodlands near water. In winter, a relatively constant temperature of about 40 degrees Fahrenheit and 80% relative humidity is required; uses caves, tunnels, abandoned mines, and similar sites. Maternity colonies commonly are in warm sites in buildings and other structures; also infrequently in hollow trees. Narrow microclimate is suitable for raising young, and availability of suitable maternity sites may limit abundance and distribution. Foraging occurs in open areas among vegetation, over water, cliff faces, meadows, farmland, and along water margins (BCI, 2015; WAPT, 2012).
Fringed myotis	*Myotis thysanodes*	SP, NS	Primarily at middle elevations of 3900 to 7000 feet in desert, grassland, and woodland habitats (Bradley, 2006). Roosts in caves, mines, rock crevices, buildings, and other protected sites. Nursery colonies occur in caves, mines, and sometimes buildings.
Long-legged myotis	*Myotis volans* [1]	NS	Primarily in montane coniferous forests, in the south most often at 6500 to 9800 feet (Bradley, 2006); also riparian and desert habitats. May change habitats seasonally. Uses caves and mines as hibernacula, but winter habits are poorly known. Roosts in abandoned buildings, rock crevices, under bark, etc. In summer, apparently does not use caves as daytime roost site. In some areas hollow trees are the most common nursery sites, but buildings and rock crevices are also used.
Fish Spring pocket gopher	*Thomomys bottae abstrusus*	NS	Endemic to Nevada. Known only from northern Fish Spring Valley, Nye County (Hall1946; 1995).
San Antonio pocket gopher	*Thomomys bottae curatus*	NS	Endemic to Nevada. Known only from San Antonio area, Nye County (Hall1946; 1995).
Pika	*Ochotona princeps*	SP, NS	Restricted to rocky talus slopes, primarily the talus-meadow interface. Often above treeline up to limit of vegetation. Also found at lower elevations in rocky areas within forests or near lakes. Occasionally on mine tailings, or piles of lumber or scrap metal. Does not dig burrows but may enlarge den or nest site under rock. Elevations between 5,994 to 12,752 feet (WAPT, 2012). A key characteristic of the American pika is its temperature sensitivity; death can occur after brief exposures to ambient temperatures greater than 77.9 °F (USFWS, 2010). Therefore, the range of the species progressively increases with elevation in the southern extents of its distribution. In Canada, populations occur from sea level to 9,840 feet, but in New Mexico, Nevada, and southern California, populations rarely exist below 8,202 feet.
Bighorn sheep	*Ovis canadensis*	GS, NS	Occur in mesic to xeric, alpine to desert grasslands or shrub-steppe in mountains, foothills, or river canyons. Many of these grasslands are fire-maintained . Suitable escape terrain (cliffs, talus slopes, etc.) is an important feature of the habitat. Require access to surface water in the desert (Shackleton, 1985).

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)
Western pipistrelle (Canyon bat)	*Parastrellus (* Formerly *Pipistrellus) hesperus*	NS	Now classified as *Parastrellus hesperus* (canyon bat), this species is common to deserts, woodlands, and shrublands. These bats roost among boulders, or in cracks and crevices of rock faces (BCI, 2015). Day and night roosts include rock crevices, under rocks, burrows and sometimes buildings or mines. May hibernate in cave, mine, or rock crevice. Typically visits water and drinks immediately after emergence each evening. Young are born in rock crevices or in buildings.
Brazilian free-tailed bat	*Tadarida brasiliensis*	SP, NS	Roosts primarily in caves in the southwestern U.S. May use rock crevice, bridge, sign, or cliff swallow nest as roost during migration. Generally roosts high (at least 10 feet) above ground to allow free fall required to attain flight. Large maternity colonies inhabit buildings and caves; also uses culverts and bridges. The diet is dominated by moths, but includes other insects as well (BCI, 2015; Bradley et al., 2006). Foraging occurs in the open (Bradley et al., 2006). Considered migratory in northern Nevada (Bradley et al., 2006).
INSECTS			
Crescent Dunes aegialian scarab	*Aegialia crrescenta*	NS	Dependent on dune or deep sand habitats. This species is only known from the sand dunes north of Tonopah, Nevada (NatureServe, 2014). Sand dunes are the only habitat known for this species. Sand dunes provide an easily penetrable substrate for access to levels of increased moisture and protection from temperature extremes (NatureServe, 2014: NNHP, 2015).
Aegialian scarab beetle	*Aegialia knighti*	NS	Resides in low, red sand hills and sand blow-outs in an area that extends South of Mormon Mesa Ridge and North and east of the Meadow Valley Wash, Weiser Wash, Muddy River drainage system fom the Longandale, Overton exchangeon Interstate 90 southward, Nevada.Mojave desert vegetation (NatureServe, 2014).
Crescent Dunes aphodius scarab	*Aphodius sp. 2*	NS	Endemic to Crescent Dunes, Nye County, Nevada (BLM, 2010).
Big Smoky wood nymph	*Cercyonis oetus alkalorum*	NS	Found locally in Big Smoky Valley in Lander County, between Northumberland Mine Road and Moore's Road. The host plant for the larvae is believed to be a grass (Austin et al, 2001).
White River wood nymph	*Cercyonis pegala pluvialis*	NS	Found along the White River in White River Valley in southern White Pine and northern Nye County, and in Lake Valley in Linoln County. Occurs on local colonies in wet meadows and near seeps. The host plant for larvae is believed to be a grass or a sedge (Austin et al, 2001).
White Mountains skipper	*Hesperia miriamae longaevicola*	NS	High elevations, above 13,100 feet, White Mountains. Found only in the White Mountains mostly in Mono County, California, but extending to Boundary Peak, Esmeralda County, Nveada (NatureServe, 2015).
Railroad Valley skipper	*Hesperia uncas fulvapalla*	NS	Found only in Railroad Valley, Nye County, Nevada (NatureServe, 2015). Habitat includes alkaline meadows and saltgrass flats on the floor of Railroad Valley (Austin et al., 2001; WildEarth Guardians, 2010).
White River Valley skipper	*Hesperia uncas grandiosa*	NS	Restricted to White River Valley, from Sunnyside north to the type locatlity, and possible Big Smokey Valley, White Pine County, Nevada (NatureServe, 2015). Habitat includes alkaline meadows and saltgrass flats in the White River Valley, also documented using its apparent hostplant, *Juncus mexicanus* in Big Smoky Valley (WildEarth Guardians, 2010). .
Great Basin small blue	*Philotiella speciosa septentrionalis*	NS	Deserts, edges of dry desert lakes, stream edges in foothills, associated with buckwheat species. The Great Basin small blue is a type locality from Fort Churchill Road, approximately 12.3 road miles south of U.S. Highway 50 in Lyon County, Nevada (Warren et al., 2012). The type locality elevation is approximately 4,400 feet (Warren et al., 2012). The Great Basin small blue is subspecies of the small blue (Philotiella speciosa). Habitat for the small blue is desert flats and dry washes (Opler and Wright, 1999). Adults are sedentary and stay close to their larval food plant (Brock and Kaufman, 2003). According to Opler and Wright (1999), the larval food plant of the small blue are Oxytheca spp. and kidney-leaf buckwheat (Eriogonum reniforme). The food plant associated with the type locality holotype is round-leaf puncturebract (Oxytheca perfoliata), which is a species of plant in the buckwheat family. Within Nevada, round-leaf puncturebract is widespread along the entire western and southwestern portions of the state, and is associated with sandy or gravelly soils (Kartesz, 1987). Kartesz (1987) indicates that the species has made its way into western Nevada by following the Lahontan Trough. Kidney-leaf buckwheat is known to occur throughout the Mojave Desert area in southern and southwestern Nevada, and extend north up the Lahontan Trough to Brady's Hot Springs in Churchill County (Kartesz, 1987). According to Kartesz (1987), within its range the kidney-leaf buckwheat is found along dry roadsides, gravelly and sandy hillsides, and gravelly washes.
Crescent Dunes serican scarab	*Serica ammomenisco*	NS	Endemic to the Crescent Dunes (Hardy and Andrews, 2010; WildEarth Guardians, 2010).

Common Name	Scientific Name	Status	Preferred Habitat (include elevation and soil type for plants)
Sand Mountain serican scarab	*Serica psammobunus*	NS	Endemic to Churchill County, Nevada (NatureServe, 2015). Found from Sand Mountain and Blow Sand Mountain, Churchill County (Hardy and Andrews, 2010; WildEarth Guardians, 2010).
MOLLUSCS			
Southern Duckwater pyrg	*Pyrgulopsis anatina*	NS	Found in freshwater in Hot Creek and Railroad Valleys, Nye County, Nevada (NatureServe, 2015). Have adapted to hot springs.
Large-gland Carico pyrg	*Pyrgulopsis basiglans*	NS	Have be located in Lander County in the Middle Humboldt Watershed (NatureServe, 2015), but locally endemic to Carico Lake Basin Hershler, 1998)
Carinate Duckwater pyrg	*Pyrgulopsis carinata*	NS	Endemic to one spring in Duckwater Valley, Nye County, Nevada. Restoration of Little Warm Spring may have contributed to habitat conditions that increased taxon's abundance (NatureServe, 2015).
Dixie Valley pyrg	*Pyrgulopsis dixensis*	NS	Endemic to springs near Hot Springs, Dixie Valley, Pershing County, NV. Pyrgulopsis are aquatic obligate snails, which encompass a diverse group with some 80 species in the Great Basin alone, many of which are locally endemic. Their presence in springs is a sign of permanent water sources, many of which have persisted for thousands of years, having become isolated as Pleistocene lakes receded. The Dixie Valley pyrg resides in thermal aquatic habitat associated with spring systems in Dixie Valley, Nevada (Hershler and Sada, 2002).
Oasis Valley pyrg	*Pyrgulopsis micrococcus*	NS	Known to exist in the Amargosa River drainage and in the Death, Panamint, and Saline Valleys in Nevada and California. Records also indicate that this species might be found in the San Bernardino Mountains in California (NaturesServe, 2015).
Wongs pyrg	*Pyrgulopsis wongi*	NS	Found in springs in CA - Mono County; NV - Douglas, Esmeralda, and Mineral County. Thermal aquatic habitat below spring systems in Owens Valley and Deep Springs Valley, California, and Fish Lake Valley and Huntoon Valley, Nevada (Hershler, 1994).

*Habitat Use: List type of use (i.e., year round, breeding, migration, foraging, etc.) and dates species would most likely be present for that activity. Breeding activities include dates of arrival through post-fledging dependency for birds. Denote probable nesting/parturition dates in parenthesis for all animals. For plants, list dates of emergence through senescence with optimal flowering times in parenthesis.

Last Updated: 1December2015
Status Codes
FE = Federally listed endangered
FT = Federally listed threatenend
FC = Federally listed candidate
SE = State listed endangered
ST = State listed threatened
SP = State protected
SS = State sensitive
GS = Game species
NS = Nevada BLM sensitive species
1: Species identified to occur near or within the project area during agency consultation

APPENDIX F
GREATER SAGE-GROUSE MITIGATION PLAN FOR THE GOLD BAR MINE PROJECT

GREATER SAGE-GROUSE MITIGATION PLAN
GOLD BAR MINE PROJECT
EUREKA COUNTY, NEVADA

McEwen Mining Inc.
2215 5th Street
Elko, Nevada 89801

January 27, 2017

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ATTACHMENTS

Attachment A ARMPA Required Design Features and Management Decisions

ACRONYMS

AMSL	Above Mean Sea Level
ARMPA	Approved Resource Management Plan Amendment
BLM	Bureau of Land Management
DEIS	Draft Environmental Impact Statement
EPM	Environmental Protection Measure
FEIS	Final Environmental Impact Statement
GHMA	General Habitat Management Area
kV	Kilovolt
LUPA/FEIS	Nevada and Northeastern California Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement
MMI	McEwen Mining Inc.
mph	Miles Per Hour
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
OHMA	Other Habitat Management Area
PHMA	Priority Habitat Management Area
PMU	Population Management Unit
Plan	Plan of Operations
Project	Proposed Action and Alternatives
ROD	Record of Decision
RDF	Required Design Feature
STM	State and Transition Model

1.0 INTRODUCTION

McEwen Mining Inc. (MMI) is proposing to construct and operate the Gold Bar Mine in Eureka County, Nevada at the southern end of the Roberts Mountain (**Figure 1**). The Gold Bar Project Draft Environmental Impact Statement (DEIS) analyzed the impacts of the Proposed Action and Alternatives (Project) to greater sage-grouse (*Centrocercus urophasianus*). This plan follows guidance set forth in the Bureau of Land Management's (BLM) *Mitigation Handbook H-1794-1* (BLM, 2016b). The mitigation hierarchy described in the policy instructs proposed projects to avoid, minimize, rectify, reduce/eliminate, and compensate for potential impacts to resources. Several aspects of the Project were designed and environmental protection measures (EPMs) were developed to avoid, minimize, rectify, and reduce/eliminate potential impacts to greater sage-grouse. After these measures were applied, the analysis determined the need for compensatory mitigation. MMI is proposing this proponent-driven mitigation plan to meet the compensatory mitigation requirements for the Project/Proposed Action and any selected Alternative(s).

1.1 Goals

The Project's DEIS determined that there would be impacts to greater sage-grouse from the implementation of the Project. Impacts are discussed in further detail in **Section 2.0**. MMI has prepared this mitigation plan with the following goals:

- To off-set the impacts to greater sage-grouse and their habitat from the Project; and
- Achieve a net conservation gain for greater sage-grouse.

1.2 Project Description

The Project/Proposed Action consists of an open pit gold mine, a water pipeline, and access roads and includes the construction and operation of the following features:

- Open pits;
- Waste rock disposal areas;
- Crushing, screening, and agglomeration facilities;
- Heap leach pad, associated process solution pond, and an event pond;
- An adsorption, desorption, and recovery plant including barren and pregnant solution tanks;
- Ancillary and other facilities including an explosives storage area, prill silos, liquid natural gas cryostorage, or compressed natural gas generators and switch station, truck shop and wash bay, ready line, landfill, laydown areas, water and power infrastructure, buildings, yards, parking, storage, growth media stockpiles, production water wells and associated

water supply pipeline, groundwater monitoring wells, communication facilities, potable water and fire water facilities, septic systems, and fencing; and

- Mine access roads (Three Bars Road, Atlas Haul Road, North Roberts Creek Road [NVN-052399], Bypass Road [NVN-91566], and Roberts Creek Road). (*Note: These roads are existing, and only North Roberts Creek Road would have any improvements*)

Construction and operation of the proposed mining facilities would result in approximately 1,129 acres of surface disturbance, which includes areas of existing disturbance and areas of proposed new disturbance. Approximately 25 acres of existing non-MMI disturbance would be reclaimed as part of the Project, which is classified as disturbance but would not be directly disturbed by Project operations. Total Project disturbance associated with the proposed mine facilities, including the 25 acres of existing non-MMI disturbance to be reclaimed and exploration disturbance authorized under previous Notices of Intent would be 1,154 acres. The Project is anticipated to have a seven-year mine life (i.e., five years of active mining and heap leaching and two years of residual heap leaching). Traffic under the Project/Proposed Action would be subject to seasonal timing restrictions from 6:00 AM to 10:00 AM and 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks.

A 25 kilovolt (kV) power distribution line was considered as an alternative means to supply power to the Project, as opposed to the on-site natural gas generators proposed in the Plan of Operations (Plan). The proposed distribution line would consist of the construction and operation of approximately 24.5 miles of new 25 kV overhead distribution line and the use of five miles of existing distribution line to supply the needed power for Project operations. The power would be supplied by Mt. Wheeler Power, Inc. to whom the necessary BLM right-of-way would be granted. The new overhead distribution line would extend from the existing Machacek Substation located on BLM-managed lands west, then north adjacent to the existing Falcon-Gonder 345 kV transmission line to the existing Atlas 25 kV overhead distribution line. At this intersection, the proposed new 25 kV overhead distribution line would tap the existing Atlas 25 kV overhead line. From there, the existing line would be utilized for approximately 4.75 miles west to a tap point on Roberts Creek Road. At this location, a new segment of 25 kV overhead distribution line would extend northwest along North Roberts Creek Road approximately 7.5 miles to the mine site.

An alternative to the Plan was considered to use Three Bars Road and Atlas Haul Road as the only means of access for both heavy and light vehicle traffic to the Plan boundary. Under this alternative, Three Bars Road and Atlas Haul Road would be the only route used to access the Project area and mine facilities. There would be no other access to the mine facilities. Traffic under this alternative would be subject to the same seasonal restrictions as the Project/Proposed Action, which would be from 6:00 AM to 10:00 AM and 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. This alternative was considered to reduce environmental impacts resulting from using two access routes, particularly impacts to greater sage-grouse leks within four miles of the proposed Roberts Creek Road access route even though the travel distance for light vehicle traffic would increase by 20 miles. There is no change in the amount of surface disturbance compared to the Project/Proposed Action.

An alternative to accessing the mine facilities was considered for light vehicle traffic to use the authorized Mount Hope access road and well field road as access to the Plan boundary instead

of Roberts Creek Road. This alternative would require light vehicle traffic to use State Route 278 to the Mount Hope access road, and then use the Mount Hope well field road to access Roberts Creek Road. The Bypass Road [NVN-91566] and North Roberts Creek Road would be used from that point to access the Plan boundary. Seasonal timing restrictions for the use of the Mount Hope access road and well field road would be the same as the Project/Proposed Action, which would be from 6:00 AM to 10:00 AM and 6:00 PM to 4:30 AM from March 1 to May 15 to reduce impacts to nearby greater sage-grouse leks. Heavy vehicle traffic would use Three Bars Road and Atlas Haul Road to access the Plan boundary, and would be subject to the same seasonal timing restrictions. Proposed disturbance for this alternative would be the same as the Project/Proposed Action. All improvements to the Mount Hope Access Road would be within the previously permitted disturbance area for the Mount Hope project. This alternative was considered to reduce environmental impacts resulting from using a longer stretch of Roberts Creek Road for light vehicle traffic, particularly impacts to greater sage-grouse leks within four miles of the proposed Roberts Creek Road access route. However, the Nevada Department of Wildlife (NDOW) identified potential adverse impacts from this alternative to the Henderson Pass Lek, which is an active lek approximately 0.12 mile from the Mount Hope well field road.

1.3 Habitat Description

The Project is located in the southern portion of the Roberts Mountain, approximately 30 miles northwest of Eureka and 13 miles north of United States Highway 50. Elevation ranges from just over 9,000 feet above mean seal level (AMSL) on the northern part of the Project area and extends through the foothill zone to the east and south to the Kobeh Valley at approximately 6,500 feet AMSL. Slopes range from nearly level along the valley (gradient less than 0.5 percent) to vertical along portions of the limestone and quartzite outcrops in the higher elevation zones. There are areas of disturbance from previous mining activities, including three pits and associated haul roads.

The Project area lies within the Roberts Creek watershed, but does not include Roberts Creek itself. There are, however, several ephemeral drainages within the Project area draining east out of the Roberts Mountain and dissecting the foothill region, eventually draining into Roberts Creek.

Vegetation communities within the Project area include curl-leaf mountain mahogany, limber pine, pinyon/juniper woodland, and sagebrush steppe. The distribution and composition of these plant communities varies throughout the study area and is influenced by soils, topography, and disturbance history. There is approximately 660 acres of existing disturbance within the Project area where vegetation has already been disturbed. **Table 1** shows the acreages of vegetation communities and existing disturbance within the Project area. More than half of the Project area is mapped as pinyon-juniper woodland, with only two percent mapped as sagebrush steppe.

Table 1 Vegetation Community Type, Existing Disturbance, and Road Acreage within the Mine Plan Boundary

Cover Type	Acres	Percent of Total
Curl-leaf Mountain Mahogany Woodland	1,189	21
Limber Pine	8	0

Cover Type	Acres	Percent of Total
Pinyon/Juniper Woodland	3,321	60
Sagebrush Steppe	101	2
Existing Disturbance[1]	660	12
Mine Access Roads[2]	282	5
Total	**5,561**	**100**

Source: GBE, 2013

[1] Existing disturbance was mapped from aerial imagery and was a combined file produced by SRK Consulting, Stantec, and MMI. Existing disturbance acreage consists of 654 acres of existing Atlas mining disturbance and approximately six acres of existing North Roberts Creek Road disturbance.

[2] Mine Access Roads acreage includes Atlas Haul Road, Three Bars Road, Bypass Road, and Roberts Creek Road. This category does not include the North Roberts Creek Road, which would be improved under the Proposed Action.

1.4 Mitigation Hierarchy

This section describes the efforts by the applicant to avoid, minimize, rectify, and reduce/eliminate potential impacts to greater sage-grouse from the Project. To achieve this, MMI has committed to EPMs. MMI has also committed to Required Design Features (RDFs), as shown in **Attachment A**, and Management Decisions from the Approved Resource Management Plan Amendment (ARMPA) (BLM, 2015a and 2015b). However, it should be noted that most of the RDFs are not "required" for non-discretionary projects and that any commitments by MMI have been done so as a good-faith effort to avoid, minimize, rectify, reduce, and eliminate impacts to greater sage-grouse.

1.4.1 AVOIDANCE MEASURES

- MMI proposes to use on-site generators in lieu of constructing a 30-mile long distribution power line through greater sage-grouse habitat. (*Note: Construction of the power line is being analyzed as an alternative to the Proposed Action in the DEIS.*)
    - This measure would avoid the potential for predator perching sites, the potential for mortality from collision, avoidance of habitat from the presence of the power line, and corvid foraging.
- MMI proposes using existing access roads instead of constructing new roads.
    - This would avoid new disturbance in greater sage-grouse habitat.

1.4.2 MINIMIZATION MEASURES

- MMI has designed the mine facilities to limit the total disturbance footprint.
    - This minimizes the total disturbance footprint from the Project/Proposed Action and avoids unnecessary disturbance in Priority Habitat Management Areas (PHMA) and General Habitat Management Areas (GHMA).
- Speed limits would be posted at 35 miles per hour (mph) on haul roads and 45 mph on access roads;

- This EPM would reduce direct impacts to greater sage-grouse by minimizing the risk of vehicle related mortality from mine traffic

- Flight diverters would be installed on any fencing within 3.1 miles of a lek using the Natural Resources Conservation Service Fence Collision Risk Tool, or other appropriate analysis, to determine best locations for diverters;

  - This EPM would reduce direct impacts to greater sage-grouse by minimizing risks of collision with fence lines near leks.

- Generators would include enhanced generator silencing packages which includes high ambient and sound-attenuated enclosures, use of noise absorbent materials, and an internal exhaust silencer system.

  - This EPM would reduce mining-related noise disturbance to below the 10 decibel threshold for noise related impacts to greater sage-grouse.

- Berms would be constructed along the haul roads in conformance with Mine Safety and Health Administration requirements that would also assist in the attenuation of noise along the haul roads;

  - This EPM would reduce direct impacts to greater sage-grouse by reducing the risk of collision along haul roads and reduce indirect impacts from mining-related noise disturbance.

- A blasting plan has been developed and included in the Plan of Operations to specifically limit blasting during atmospheric conditions (inversions) that could propagate blasting noise beyond the mine area.

  - This EPM would reduce indirect impacts to greater sage-grouse from mining-related noise disturbance.

- A reclamation/revegetation plan has been developed and included in the Plan for the Project's high elevation waste rock dumps to specifically address the unique challenges resulting from the edaphic, geologic, and physiographic conditions of the area. The revegetation plan is specifically focused on the development of greater sage-grouse habitat in areas that were either previously disturbed and unreclaimed or woodland dominated;

  - This EPM would reduce indirect impacts to greater sage-grouse by improving the post-mining habitat within the Project area. The reclamation is designed to create greater sage-grouse habitat in the reclaimed areas.

- New hire and annual refresher training for all employees and contractors would include greater sage-grouse-specific protection training that specifically addresses the commitment of MMI to implement the protection program and the need for all employees to avoid harassment and disturbance of greater sage-grouse, especially during the breeding season. MMI would work with NDOW in the development of training materials;

- This EPM would reduce indirect impacts to greater sage-grouse by educating MMI personnel on the potential effects and measures to reduce impacts during operation.

- Any overhead power lines within four miles of active and pending active leks would be constructed with perch deterrents, where applicable. Actions would be completed in consideration of the latest Avian Power Line Interaction Committee guidelines with assistance of the BLM and NDOW for the appropriate predatory bird anti-perching devices;

  - This EPM would reduce indirect impacts to greater sage-grouse by reducing the potential for predator perching and increased foraging area. This EPM would also reduce direct impacts by minimizing the power lines collision risk.

- Hazardous material storage would include secondary containment to preclude contamination of surface water or groundwater resources that animals could access.

  - This EPM would reduce indirect impacts to greater sage-grouse by minimizing the potential for habitat degradation from hazardous contaminants.

- Travel timing restrictions would be implemented during lekking season (March 1 – May 15) on Three Bars Road and Roberts Creek Road, from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM. Emergency and local traffic would be exempt from these restrictions.

  - This EPM would reduce indirect impacts to greater sage-grouse by minimizing vehicular related disturbance and noise during the lekking period.

- Access road work, road maintenance-related work, gravel pit work conducted by MMI within four miles of an active or pending lek are subject to timing restrictions during lekking season (March 1 – May 15) from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM.

  - This EPM would reduce indirect impacts to greater sage-grouse by minimizing vehicular related disturbance and noise during the lekking period.

- MMI would conduct lek attendance monitoring, following NDOW monitoring protocols, for all leks within a two-mile distance of Three Bars and Roberts Creek access roads. Specific triggers would be developed with the BLM and NDOW tied to declining numbers that cannot be accounted for by normal variation and action items to further prevent impacts to greater sage-grouse populations. Leks found to be unoccupied after three successive years of monitoring would be proposed to the BLM and NDOW to be designated as inactive, and monitoring of those leks would be suspended. If no adverse impact to active leks is demonstrated after five years of monitoring, MMI would be able to request suspension of all lek monitoring.

  - This EPM would reduce indirect impacts to greater sage-grouse by collecting data to inform adaptive management decisions should declines in lek attendance be attributed to mining activities.

1.4.3 RECTIFICATION MEASURES

- MMI incorporated pre-existing unreclaimed disturbance into the Project, some of which would be reclaimed, thus improving habitat.

- This would restore ecological function in areas of PHMA and GHMA within the Project boundary.

1.4.4 REDUCTION / ELIMINATION MEASURES

- A Noxious Weed Plan has been developed and included in the Plan to prescribe methods to prevent and control the spread of noxious weeds during construction and operation of the Project;
    - This EPM would reduce indirect impacts to greater sage-grouse by reducing the risk of habitat degradation from the establishment and spread of noxious and invasive weed species.
- MMI would implement concurrent reclamation during operations, where possible.
    - This would reduce indirect impacts to habitat.

1.5 Regulatory Framework

The Record of Decision (ROD) for the Nevada and Northeastern California Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement (LUPA/FEIS) prepared by the BLM and United States Forest Service was signed in September 2015. The LUPA/FEIS was prepared with the assistance of 24 cooperating agencies. Greater sage-grouse habitat on BLM-administered and National Forest System lands in the decision area consists of lands allocated as PHMA, GHMA, and Other Habitat Management Areas (OHMA). PHMA is defined as lands identified as having the highest value to maintaining sustainable greater sage-grouse populations. GHMA is defined as lands where some special management would apply to sustain greater sage-grouse populations. OHMA is defined as lands identified as unmapped habitat in the LUPA/EIS that are within the planning area and contain seasonal or connectivity to habitat areas.

This mitigation plan was developed in accordance with the *Mitigation Handbook H-1794-1* (BLM, 2016b). The *Greater Sage-Grouse Range-Wide Mitigation Framework* (USFWS, 2014) was used for guidance, especially with respect to standards for mitigation.

2.0 IMPACTS MITIGATION

2.1 Impacts Being Mitigated

The Project/Proposed Action would result in the direct loss of greater sage-grouse habitat. Some of the alternatives, if selected, would also have direct impacts to greater sage-grouse habitat. **Table 2** presents the disturbance acreage by alternative for the Sagebrush Ecosystem Program December 2015 habitat category mapping. **Figure 1** shows the Project/Proposed Action and Alternatives with the December 2015 habitat categories. As a conservative approach, disturbance associated with exploration activities was included under PHMA for the Project/Proposed Action (65 acres), since the exact locations have not been determined and could occur in either PHMA or GHMA.

Table 2 Disturbed Greater Sage-grouse Habitat Types and Seasonal Habitat

Habitat Type	Acres Disturbed			
	Project/Proposed Action[1]	25 kV Overhead Distribution Line Alternative (40-Foot Permanent ROW)[1,2]	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative
December 2015 SEP Habitat Category Mapping				
PHMA	192	56	0	0
GHMA	542	33	0	0
OHMA	0	13	0	0
NDOW Seasonal Habitat Mapping				
Late Summer	11	126	0	0
Winter	5	106	0	0
Nesting and Early Brood Rearing	6	75	0	0

[1]Acreages exclude existing disturbance.
[2]Acreage excludes cultural avoidance areas and areas within the Plan boundary.

The disturbance from the Project/Proposed Action and would be term impacts, lasting until successful reclamation to a shrub-dominated community. The Project/Proposed Action would have 154 acres of permanent (non-reclaimed) disturbance. The Project is not expected to result in direct mortality to greater sage-grouse, as any individuals within the Project area are expected to disperse upon commencement of ground-disturbing activities. However, accidental mortalities could occur from vehicle collisions, but this risk would be reduced by implementing the speed limit restrictions outlined in **Section 1.4.2**. Additionally, no leks would be directly disturbed from the Project.

2.2 Mitigation Approach

Top threats to greater sage-grouse in this region include fire, conifer encroachment, noxious and invasive weeds, annual grasses, improper grazing management, and wild horses (BLM, 2015a). To address some of these threats, MMI would contract with a third-party contractor to conduct treatments in one or more areas analyzed in the 3 Bars Ecosystem Final EIS (FEIS) (BLM, 2016a) to mitigate for direct impacts to greater sage-grouse habitat from the Project. MMI is proposing a 4:1 mitigation ratio for PHMA, 3:1 mitigation ratio for GHMA, and 2:1 mitigation ratio for OHMA. The mitigation of OHMA and GHMA acres could occur in areas mapped as GHMA or PHMA. Net conservation gain would be demonstrated using quantification of ecological attributes within the treatment areas and demonstrate an uplift over baseline conditions.

Table 3 Acres Mitigated

December 2015 SEP Habitat Category Mapping	Acres			
	Proposed Action[1]	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative
PHMA (4:1)	768	224	0	0
GHMA (3:1)	1,626	99	0	0
OHMA (2:1)	0	26	0	0

Numerous treatment units were approved through the 3 Bars Ecosystem FEIS. If seeding is proposed in a treatment plan, only treatment units outside wild horse herd management areas would be considered for treatment. Additionally, the acreage within eligible treatment units would be modified to exclude BLM-identified livestock "moderate and heavy use" areas. Both criteria would be utilized so that treatments could be implemented within a reasonable timeframe, given the 3 Bars Ecosystem FEIS states that seeding treatments would not occur in areas where horse populations were over approved management level, nor where livestock grazing permits may need modifications due to identified improper use. As this mitigation plan is focused on greater sage-grouse, no pinyon-juniper thinning treatments would be considered, only treatments where complete pinyon-juniper tree removal is prescribed. MMI would select from a combination of treatment units (**Figure 2**) and treatment methods to meet their total mitigation obligation.

Although treatment methods for each type of treatment unit (i.e., sage, riparian, or pinyon-juniper) were approved through the 3 Bars Ecosystem FEIS, treatment unit specifics have not been determined. Therefore, MMI would develop unit-specific treatment plans that utilize approved treatment methods to address the goals and objectives for each unit. The treatment plan(s) would be submitted to BLM for review and authorization before treatments could be implemented. The draft treatment plan(s) would be developed and submitted to BLM for review within six months of the signed ROD for the Gold Bar Mine Project FEIS. Initial treatments would be completed within two years of the signing of the ROD.

The following vegetation treatment methods were analyzed in the 3 Bars Ecosystem FEIS and could be utilized in the development of the unit-specific treatment plans:

- Seeding – hand seeding, broadcast seeding, drill seeding, harrow seeding, aerial broadcast, and hand planting;
- Manual – hand tools to clear, cut, or prune herbaceous and woody species, selective cutting, and hand cutting or removal of noxious weeds; and
- Mechanical – mowing, mulching/shredding, tilling, roller chopping, feller-buncher, and tree shearer.

2.2.1 PRE-TREATMENT IMPLEMENTATION REQUIREMENTS

Pre-treatment field data for the treatment units would be collected by MMI or a qualified contractor. This data would be specific to the treatment unit objectives and would be used as the benchmark to determine treatment effectiveness and uplift. For example, percent cover and density of pinyon-juniper would be relevant to areas where pinyon-juniper treatments are proposed; likewise, perennial grass cover and density would be pertinent to sagebrush treatment areas. See **Section 3.4.1** for a detailed discussion of monitoring methods. Percent cover of annual invasive and noxious species would be important to determine maintenance activities.

Many of the 3 Bars Ecosystem treatment units have had archaeological surveys completed. However, if archaeological surveys have not been completed within the selected treatment area(s), MMI would be responsible for contracting with a qualified consultant to conduct the Class III archeological surveys before treatment is implemented.

3.0 STANDARDS OF MITIGATION

3.1 Siting

Compensatory mitigation should be completed in areas that have been identified as likely to successfully and fully compensate losses to greater sage-grouse (USFWS, 2014). The areas selected for mitigation of impacts were analyzed in the 3 Bars Ecosystem FEIS as having a benefit to greater sage-grouse and their habitat. Additionally, the mitigation would occur in the same Population Management Unit (PMU) as the Project, thereby benefiting the same population of greater sage-grouse being impacted. It is believed that siting mitigation in this manner meets the intent of the 2014 USFWS guidance.

3.2 Duration

The timeframe of the mitigation should be commensurate and proportional with the biological impacts being off-set (USFWS, 2014). The Project would have a mine-life of approximately seven years for construction, operation, and leaching (including residual heap leaching). Reclamation is anticipated to be completed within six years after the cessation of active mining and residual heap leaching. As mitigation to off-set the impacts to greater sage-grouse habitat from the Project, MMI would be responsible for treatment implementation, monitoring, and adaptive management and remedial treatments to off-set the direct impacts until active reclamation bond is completed. This timeframe ensures that treatment effects would be realized until disturbance in the Project area is completed. See **Section 3.4** for a discussion of effectiveness and monitoring.

3.3 Additionality

The treatments would be conducted in accordance with the 3 Bars Ecosystem FEIS and should provide benefits beyond those that would be achieved if MMI does not complete them, and would exceed what is otherwise required by federal, state, or local regulations. The treatments proposed in this plan would provide benefits to other sagebrush obligate species besides greater sage-grouse. Additionally, as treatments conducted as part of the 3 Bars Ecosystem restoration, these treatments would have beneficial, cumulative effects at the landscape level. Although the treatments in the 3 Bars Ecosystem FEIS are approved by BLM, the FEIS does not give authorization or monetary certainty for their implementation. The unit-specific treatment plans, developed by MMI (or a qualified third-party contractor), would require additional National Environmental Policy Act (NEPA) action by BLM (e.g., Determination of NEPA Adequacy) for approval and before treatments could be implemented.

This mitigation plan proposes to have MMI or a qualified third-party contractor (paid by MMI) conduct treatments which BLM currently does not have funding to complete. Therefore, MMI's commitment to fund and complete treatments allows for habitat restoration and preservation that currently has no timeframe for completion, if dependent on BLM to complete.

3.4 Effectiveness

According to USFWS (2014), the mitigation actions should be likely to deliver expected conservation benefits, targeted to provide the greatest benefit to greater sage-grouse, and be measurable. This mitigation plan has objectives that would be used to determine if the treatments are effective and to determine if habitat has been improved for greater sage-grouse. As discussed in **Section 2.2**, pre-treatment field data would be used as the benchmark to determine the effectiveness of the treatments. Additionally, this mitigation plan is centered on achieving habitat objectives in accordance with the 3 Bars Ecosystem FEIS, with a specific focus on improving greater sage-grouse habitat, rather than MMI committing a pre-determined dollar amount per acre of mitigation.

3.4.1 EFFECTIVENESS MONITORING

MMI would monitor for the effectiveness of this mitigation plan per 43 Code of Federal Regulations 3809.401(b)(4)). Per the 3 Bars Ecosystem FEIS (BLM, 2016a), treatment effectiveness monitoring within greater sage-grouse habitat would be performed to assess if treatments are meeting specific habitat objectives as outlined in the specific treatment unit plans. Treatment unit objectives would be in accordance with **Table 2-2** in the *Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM, 2015b). Table 2-2 covers a wide variety of greater sage-grouse habitat and habitat objectives, many of which are easily influenced by livestock and wild horse grazing, as well as climactic variability. MMI would focus on attaining the treatment unit objectives from the 3 Bars Ecosystem FEIS, and some of the "general/landscape level" objectives in Table 2-2 of the ARMPA (BLM, 2015b), specifically those objectives related to sagebrush and annual grass cover, and conifer encroachment.

Additionally, to demonstrate a net conservation gain for greater sage-grouse habitat, MMI proposes to quantify and compare ecological attributes of greater sage-grouse habitat in accordance with the *Sage-Grouse Habitat Assessment Framework* (Stiver et al., 2015). A baseline evaluation of important vegetative parameters for greater sage-grouse habitat would be implemented on all potential treatment units and be relevant to the specified treatment methods. Field data would be collected using standardized metrics presented in the *Sage-Grouse Habitat Assessment Framework* (Stiver et al., 2015). Specifically, quantification of vegetative ground cover with the point-intercept technique would provide the most precise and accurate data to demonstrate beneficial outcomes. Baseline vegetation data collection and post-treatment monitoring data collection would quantify the following parameters to determine uplift:

- Tree Cover – A measurement of the amount of tree foliar cover (percent) by species.
- Sagebrush Cover – A measurement of the amount of sagebrush foliar cover (percent) by species.
- Grass Cover – A measurement of the amount of perennial and annual grass foliar cover (percent) by species.

- Forb Cover – A measurement of the amount of perennial and annual foliar cover (percent) by species.

- Preferred Forb Availability – A measurement of the diversity of preferred forb species.

Except for tree cover and annual grass cover, the above parameters would all need to increase above baseline conditions to prove a net conservation gain. For the tree objective, pinyon-juniper cover would need to be less than one percent total live foliar cover to show net conservation gain. The "tree" metric is not evaluated against baseline conditions because the treatment prescriptions would be for complete pinyon-juniper removal. Additionally, control plots (not treated) would be established adjacent to treatment units, within the same ecological site, to determine if treatment units have increased invasive annual grasses and/or forbs compared to the control area.

Following treatment application, monitoring would be conducted one, three, and five years (growing seasons) post-treatment, to evaluate the success, quantify outcomes beneficial to greater sage-grouse, and monitor invasive weeds. Once treatment unit objectives are met, only monitoring for pinyon-juniper establishment and invasive weeds would be required. If effectiveness monitoring data concludes that treatment unit objectives are not met by the fifth year post-treatment, MMI would draft an adaptive management plan to address specific failing objectives and potential treatments (approved in the 3 Bars Ecosystem FEIS) for rectification. These adaptive management treatments would be in addition to the maintenance treatments addressed in **Section 3.5.1**. The additional treatments would be completed within six months of BLM's approval or during the next appropriate treatment season (e.g., seeding in fall) after approval. MMI would be responsible for monitoring at least every three years and implementing adaptive management until active reclamation is completed.

Quantifiable benefits to greater sage-grouse habitat would be demonstrated by comparing baseline and post-treatment monitoring for each treatment area.

3.5 Durability

Durability refers to the management, legal, and financial assurances that ensure the plan will be in place and effective for the duration of impacts (USFWS, 2014). The monetary assurance and treatment maintenance discussed below are intended to account for unintentional loss/force majeure (e.g., wildfire) and intentional loss (e.g., abandonment of Project) of the plan. BLM would be responsible for minimizing other potential impacts to treated areas (i.e., trespass grazing, etc.).

3.5.1 MAINTENANCE

As outlined in the 3 Bars Ecosystem FEIS, all treatment units would be monitored for noxious weeds or other non-native invasive vegetation following treatment. MMI would then be responsible for monitoring and treating noxious weeds, every three years, in treatment units until the Project's active reclamation is completed. If noxious weeds are found in the treatment unit(s), they would be treated with an appropriate and approved method, in accordance with the Battle Mountain BLM's *Integrated Weed Management Plan* (BLM, 2009).

In areas where pinyon-juniper removal is implemented, MMI would be responsible for maintaining this treatment at five-year intervals, until active reclamation is completed. This maintenance activity would likely consist of hand-removal of newly established or sprouting pinyon-juniper trees within the treated areas. Any additional maintenance requirements would be specified in the unit specific treatment plans.

3.5.2 FINANCIAL ASSURANCE

The amount of financial assurance provided and the funding mechanism utilized would be coordinated with BLM and USFWS. The amount of financial assurance would be sufficient to cover all costs required for a third-party contractor to conduct the treatments, monitoring, and maintenance activities.

3.6 Metrics

In accordance with USFWS (2014), determination of expected impacts of mitigation actions and the measures necessary to avoid, minimize, or compensate for those impacts should be based on biological conditions and upon reliable, repeatable, and quantitative science-based methods. As such, the measures used to avoid, minimize, and compensate for impacts to greater sage-grouse from the Project are presented in **Section 1.4** of this plan and are analyzed in the Gold Bar DEIS. The treatments utilized for mitigation have been analyzed in the 3 Bars Ecosystem FEIS (BLM, 2016a). This plan has attempted to utilize treatment areas that would not require further mitigation.

3.7 Summary

This mitigation plan is intended to mitigate the impacts to greater sage-grouse of the Project. The unit specific treatment plans would focus on restoring or enhancing sagebrush and riparian habitat and working towards achieving ecological site potential, in accordance with the goals and objectives outlined in the 3 Bars Ecosystem FEIS. Additionally, habitat would be improved for other species such as mule deer, other sagebrush obligate species, and migratory birds, among others. The mitigation proposed in this plan is designed to have a net conservation gain for greater sage-grouse, specifically within the Three Bar PMU, by implementing treatments with objectives that enhance the quality and connectivity of greater sage-grouse habitat. Additionally, the mitigation acreage ratios consider the impact that the Project can have at the site scale, as well as the landscape scale. Net conservation gain would be ensured by improving habitat above baseline conditions (i.e., uplift) within the treatment units.

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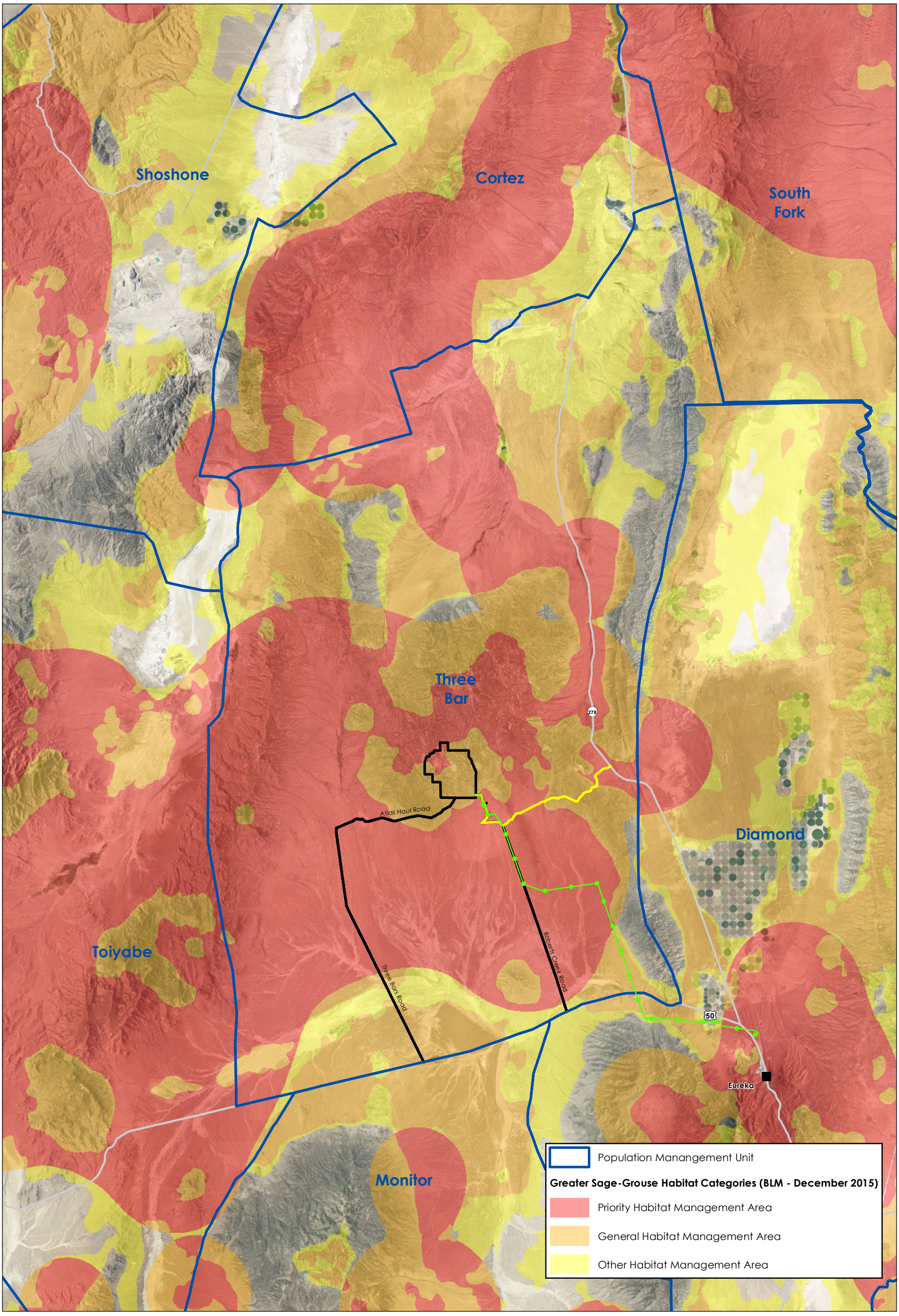
FIGURES



Legend

- Gold Bar Project Area
- 25 kV Overhead Distribution Line Alternative
- Mount Hope and North Roberts Creek Road Alternative

N

Miles

0 3 6 1 in = 6 miles

Stantec

McEwen Mining Inc.
Gold Bar Sage-Grouse Mitigation Plan

Eureka and Lander County, NV
NAD 1983 UTM Zone 11N

DRAWN BY: JT | 1ST REVIEW: CJ | 2ND REVIEW: EF

DATE: 1/18/2017 | PROJECT NO: 203703023

Figure 1
Project Location

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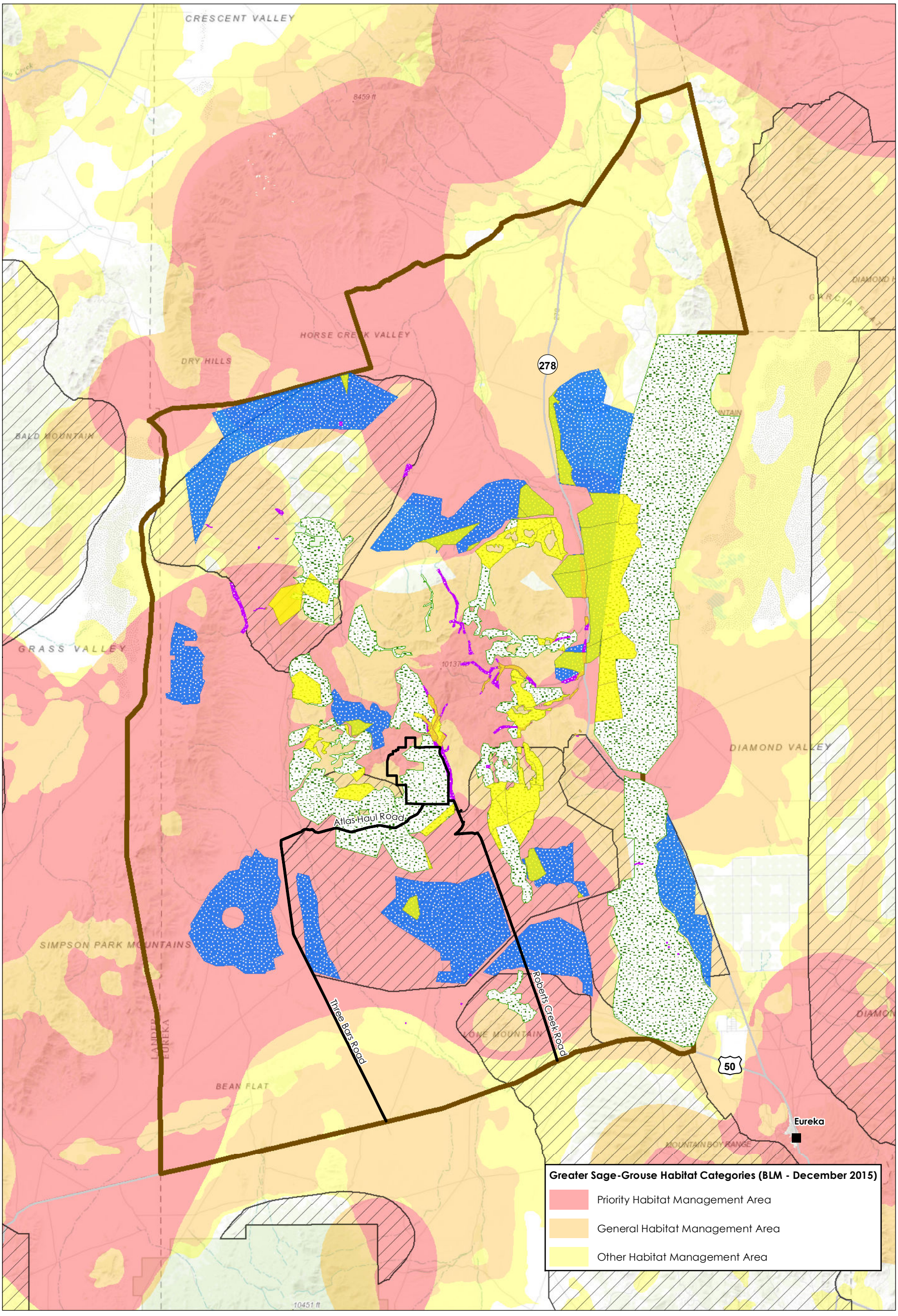

Legend

- Gold Bar Project Area
- Three Bar PMU
- Herd Management Areas
- Moderate/Heavy/Severe Livestock Use Area
- Sagebrush Treatment Area
- PJ Treatment Area
- Riparian Treatment Area

N

Stantec

Miles
0 2.5 5 1 in = 5 miles

Eureka and Lander County, NV
NAD 1983 UTM Zone 11N

DRAWN BY: JT	1ST REVIEW: CJ	2ND REVIEW: EF
DATE: 1/24/2017	PROJECT NO: 203703023	

McEwen Mining Inc.
Gold Bar Sage-Grouse Mitigation Plan

Figure 2
3 Bars FEIS
Potential Mitigation Areas

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ATTACHMENT A

ARMPA Required Design Features and Management Decisions

Table 1 Minerals Resources Management Decisions for Locatable Minerals

MDMR #	MDMR Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
15	Review **Objective SSS 4**, and to the extent allowed by law, apply **MDs SSS 1 through SSS 4** when reviewing and analyzing projects and activities proposed in GRSG habitat. (Note: SSS 1 through SSS 4 are addressed below in **Table 2**).	Yes	Yes	No	Yes	Yes	Yes	Objective SSS 4: In PHMAs and GHMAs, apply the concept of "avoid, minimize, and compensatory mitigation" for all human disturbance in areas not already excluded or closed, so as to avoid adverse effects on GRSG and its habitat. The first priority will be to avoid new disturbances (GRSG Amendment, Appendices F and I). The proposed Project is a non-discretionary 43 CFR 3809 action, therefore implementing this management decision is limited to preventing unnecessary and undue degradation. The BLM is coordinating with MMI to determine appropriate mitigation to offset residual impacts using either the State of Nevada's Conservation Credit System (CCS) or a proponent driven plan.
16	Recommend for withdrawal SFA under the General Mining Act of 1872, as amended, subject to valid existing rights (see Appendix A; Figures 2-1 and 2-4).	No	-	-	-	-	-	No Sagebrush Focal Areas (SFAs) are located within or in proximity to the Project boundary.
17	On public lands, manage disturbances associated with notice-level activity in GRSG habitat on a landscape basis to avoid segmenting a project. Do this by encouraging operators and claimants to consolidate exploration into a plan of operations to reduce the proliferation of mining notices, in accordance with 43 CFR, Part 3809.21(b).	Yes	Yes	Yes	Yes	Yes	No	Exploration is proposed for this Project; therefore, the exploration in the Project area would be associated with the Plan.
18	Subject to valid existing rights and applicable law, authorize locatable mineral development activity, by approving plans of operation and apply mitigation and best management practices that minimize the loss of PHMAs and GHMAs or that enhance GRSG habitat by applying the "avoid, minimize and compensatory mitigation" process through an applicable mitigation system, such as the Nevada Conservation Credit System.	Yes	Yes	Yes	Yes	Yes	Yes	The proposed Project is a non-discretionary 43 CFR 3809 action, therefore implementing this management decision is limited to preventing unnecessary and undue degradation. Avoidance and minimization measures are discussed in **Section 2.2.20**. The BLM is coordinating with MMI to determine appropriate mitigation to offset residual impacts using either the State of Nevada's Conservation Credit System (CCS) or a proponent driven plan.
19	Close or mitigate abandoned mine sites in PHMAs and GHMAs to reduce GRSG predation by eliminating physical structures that could provide nesting opportunities and perching sites for predators.	No	-	-	-	-	-	This would be an active Project area therefore this MD does not apply to this Project. Site reclamation is described in **Section 2.2.19**.

Table 2 Management Decision(s) SSS 1 through SSS 4

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 1	In PHMAs and GHMAs, work with the proponent/applicant, whether in accordance with a valid existing right or not, and use the following screening criteria to avoid effects of the proposed human activity on GRSG habitat: A. First priority – locate project/activity outside PHMAs and GHMAs B. Second priority – If the project/activity cannot be placed outside PHMAs and GHMAs, locate the surface-disturbing activities in non-habitat areas first, then in the least suitable habitat for GRSG C. Third priority – collocate the project/activity next to or in the footprint of existing infrastructure	Yes	Yes	Yes	Yes	Yes	Yes	The Project cannot be located outside of PHMA or GHMA; however, the proposed Project is located at the site of the previous Atlas Mine. Therefore, this project would be collocated with the existing footprint of the previous mine. The 25 kV overhead distribution line would be collocated with existing power line features where possible.
SSS 2 (PHMA)	In PHMAs, the following conditions will be met in order to avoid, minimize, and mitigate any effects on GRSG and its habitat from the project/activity:							
SSS 2A (PHMA)	Manage discrete anthropogenic disturbances, whether temporary or permanent, so they cover less than 3 percent of 1) biologically significant units (BSUs; total PHMA area associated with a GRSG population area (see Appendix A; Figure 2-2) and 2) in a proposed project analysis area. See Appendix E (Disturbance Cap Guidance) for additional information on implementing the disturbance cap, including what is and is not considered disturbance and how to calculate the proposed project analysis area, as follows: 1. If the 3 percent human disturbance cap is exceeded on all lands (regardless of ownership) in PHMAs in any given BSU, then no further discrete human disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, as amended, and valid existing rights) will be permitted, by BLM within GRSG PHMA in any given BSU until the disturbance has been reduced to less than the cap (see Nevada exception under MD SSS 2 a. 3. Appendix E). 2. If the 3 percent disturbance cap is exceeded on all lands (regardless of land ownership) within a proposed project analysis area in a PHMA, then no further anthropogenic disturbance will be permitted by BLM until disturbance in the proposed project analysis area has been reduced to maintain the area under the cap (subject to applicable laws and regulations, such as the 1872 Mining Law, as amended, valid existing rights; see Nevada exception under MD SSS 2 a. 3. Appendix E).	No	-	-	-	-	-	GRSG Amendment Appendix E directs that the disturbance cap analysis should be conducted and results provided in NEPA analyses, but any exceedances of the cap (at both the BSU and project levels scales) do not apply to locatable mineral resources project with existing valid rights from BLM approval.
SSS 2B (PHMA)	In PHMA, in undertaking BLM management actions, and consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. The project/activity with associated mitigation (such as the use of the State of Nevada Conservation Credit System) will result in an overall net conservation gain to GRSG (Appendix F).	Yes	Yes	Yes	Yes	Yes	Yes	The BLM is coordinating with MMI to determine appropriate mitigation to offset residual impacts in PHMA using either the State of Nevada's Conservation Credit System (CCS) or a proponent driven plan.

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 2C (PHMA)	Authorized/permitted activities are implemented by adhering to the RDFs described in Appendix C, consistent with applicable law. At the site-specific scale, if an RDF is not implemented, at least one of the following must be demonstrated in the NEPA analysis associated with the project/activity: 1. A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to the site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. 2. An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. 3. A specific RDF will provide no additional protection to GRSG or its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. MMI has committed to the EPMs presented in **Section 2.2.20**.
SSS 2D (PHMA)	In management actions, and consistent with valid and existing rights and applicable law in authorizing third- party actions, the BLM will apply the lek buffer-distances identified in the USGS report, Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review Open File-Report 2014-1239 (Manier et al., 2014), in accordance with Appendix B.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. The Project holds valid existing rights and therefore is not subject to lek buffer distances identified in Appendix B of the GRSG Amendment.
SSS 2E (PHMA)	Seasonal restrictions will be applied during the period specified below to manage discretionary surface- disturbing activities and uses on public lands to prevent disturbances to GRSG during seasonal life-cycle periods: 1. In breeding habitat within 4 miles of active and pending GRSG leks from March 1 through June 30 a. Lek—March 1 to May 15 b. Lek hourly restrictions—6 p.m. to 9 a.m. c. Nesting—April 1 to June 30 2. Brood-rearing habitat from May 15 to September 15 a. Early—May 15 to June 15 b. Late—June 15 to September 15 3. Winter habitat from November 1 to February 28 The seasonal dates may be modified due to documented local variations (e.g., higher/lower elevations) or annual climatic fluctuations (e.g., early/late spring, long/heavy winter), in coordination with NDOW, in order to better protect GRSG and its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. MMI has committed to the following measures: • Travel timing restrictions would be implemented during lekking season (March 1 – May 15) on Three Bars Road and Roberts Creek Road, from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM. Emergency and local traffic would be exempt from these restrictions. • Access road work, road maintenance-related work, gravel pit work conducted by MMI within four miles of an active or pending lek are subject to timing restrictions during lekking season (March 1 – May 15) from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM.

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 2F (PHMA)	Authorizations and permits will limit noise from discretionary activities (during construction, operation, and maintenance) to not exceed 10 decibels above ambient sound levels at least 0.25 mile from active and pending leks, from 2 hours before to 2 hours after sunrise and sunset during the breeding season. See Appendix M, Greater Sage-Grouse Noise Protocol.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and therefore this MD is not applicable. However, the project is not expected to increase noise levels more than 10 dBA above ambient levels at near-by lek locations. This is discussed is detail in **Section 4.21.2**. Additionally, MMI has committed to the following EPMs: • Noise from generators could be shielded by a combination of a sound enclosure at the generator with an additional sound wall constructed adjacent to and between the generators and the leks, if required. Should a sound wall be necessary, it would be approximately 14 feet tall to attenuate the generator noise at the leks. • Noise would also be reduced through installation of an enhanced generator silencing package on the generators. • Berms would be constructed along the haul roads in conformance with MSHA requirements that would also assist in the attenuation of noise along the haul roads.
SSS 3 (GHMA)	In GHMAs, the following conditions will be met in order to avoid, minimize, and mitigate any effects on GRSG or its habitat from the project/activity:							
SSS 3A (GHMA)	In GHMAs, in undertaking BLM management actions, and consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. The project/activity with associated mitigation (such as the use of the State of Nevada Conservation Credit System) in GHMAs will result in an overall net conservation gain to GRSG (Appendix F, Regional Mitigation Strategy).	Yes	Yes	Yes	Yes	Yes	Yes	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. The BLM is coordinating with MMI to determine appropriate mitigation to offset residual impacts using either the State of Nevada's Conservation Credit System (CCS) or a proponent driven plan.

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 3B (GHMA)	Authorized/permitted activities are implemented adhering to the RDFs described in Appendix C, consistent with applicable law. At the site-specific scale, if an RDF is not implemented, at least one of the following must be demonstrated in the NEPA analysis associated with the project/activity: 1. A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to the site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. 2. An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. 3. A specific RDF will provide no additional protection to GRSG or its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. MMI has committed to the EPMs presented in **Section 2.2.20**.
SSS 3C (GHMA)	In undertaking BLM management actions, and consistent with valid and existing rights and applicable law in authorizing third-party actions, the BLM will apply the lek buffer-distances identified in the USGS report, Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review Open File Report 2014-1239 (Manier et al., 2014), in accordance with Appendix B.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation.
SSS 3D (GHMA)	Seasonal restrictions will be applied during the period specified below to manage discretionary surface- disturbing activities and uses on public lands to prevent disturbing GRSG during seasonal life cycle periods, as follows: 1. In breeding habitat within 4 miles of active and pending GRSG leks from March 1 through June 30 a. Lek—March 1 to May 15 b. Lek hourly restrictions—6 p.m. to 9 a.m. c. Nesting—April 1 to June 30 2. Brood-rearing habitat from May 15 to September 15 a. Early—May 15 to June 15 b. Late—June 15 to September 15 3. Winter habitat from November 1 to February 28 The seasonal dates may be modified due to documented local variations (e.g., higher/lower elevations) or annual climatic fluctuations (e.g., early/late spring, long/heavy winter), in coordination with NDOW, in order to better protect GRSG and its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. MMI has committed to the following EPMs: • Travel timing restrictions would be implemented during lekking season (March 1 – May 15) on Three Bars Road and Roberts Creek Road, from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM. Emergency and local traffic would be exempt from these restrictions. • Access road work, road maintenance-related work, gravel pit work conducted by MMI within four miles of an active or pending lek are subject to timing restrictions during lekking season (March 1 – May 15) from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM.

MD #	MD Text	Applicable (Yes/No)	GRSG Amendment Consistency by Alternative (Yes/No)					Notes
			Proposed Action	25 kV Overhead Distribution Line Alternative	Three Bars Road/Atlas Haul Road as Only Access Alternative	Mount Hope and North Roberts Creek Road for Light Vehicle Traffic Alternative	No Action Alternative	
SSS 3E (GHMA)	Authorizations and permits will limit noise from discretionary activities (during construction, operation, and maintenance) to not exceed 10 decibels above ambient sound levels at least 0.25 mile from active and pending leks, from 2 hours before to 2 hours after sunrise and sunset during the breeding season. See Appendix M, Greater Sage-Grouse Noise Protocol.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and therefore this MD is not applicable. However, MMI has committed to the following EPMs: • Noise from generators could be shielded by a combination of a sound enclosure at the generator with an additional sound wall constructed adjacent to and between the generators and the leks, if required. Should a sound wall be necessary, it would be approximately 14 feet tall to attenuate the generator noise at the leks. • Noise would also be reduced through installation of an enhanced generator silencing package on the generators. • Berms would be constructed along the haul roads in conformance with MSHA requirements that would also assist in the attenuation of noise along the haul roads.
SSS 4 (OHMA)	In OHMAs, authorized/permitted activities are implemented adhering to the RDFs described in Appendix C, consistent with applicable law. At the site-specific scale, if an RDF is not implemented, at least one of the following must be demonstrated in the NEPA analysis associated with the project/activity: 1. A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to the site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. 2. An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. 3. A specific RDF will provide no additional protection to GRSG or its habitat.	No	-	-	-	-	-	The proposed Project is a non-discretionary 43 CFR 3809 action, and discretion is limited to preventing unnecessary and undue degradation. There is no OHMA present within the Project boundary. There is OHMA present along the 25 kV overhead distribution line alternative alignment.

Table 3 General Required Design Features

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
Gen 1	Locate new roads outside of GRSG habitat to the extent practical.	No	Most roads associated with this project are existing and would only be improved for safety and to allow for heavy-haul traffic. Access to the mine would be on existing roads. Roads are described in **Section 2.2.2**.
Gen 2	Avoid constructing roads within riparian areas and ephemeral drainages. Construct low-water crossings at right angles to ephemeral drainages and stream crossings (note that such construction may require permitting under Sections 401 and 404 of the Clean Water Act).	No	No riparian areas are present within the Project boundary.
Gen 3	Limit construction of new roads where roads are already in existence and could be used or upgraded to meet the needs of the project or operation. Design roads to an appropriate standard, no higher than necessary, to accommodate intended purpose and level of use.	No	Most roads associated with this project are existing and would only be improved for safety and to allow for heavy-haul traffic. Access to the mine would be on existing roads. Roads are described in **Section 2.2.2**.
Gen 4	Coordinate road construction and use with ROW holders to minimize disturbance to the extent possible.	No	The Project is not anticipated to impact any ROWs (**Section 4.10.2**).
Gen 5	During project construction and operation, establish and post speed limits in GRSG habitat to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.	No	MMI has committed to the following EPM: • Speed limits would be posted at 35 miles per hour (mph) on haul roads and 45 mph on access roads.
Gen 6	Newly constructed project roads that access valid existing rights would not be managed as public access roads. Proponents will restrict access by employing traffic control devices such as signage, gates, and fencing.	No	Site access is described in **Section 2.2.7**, and would include fencing and gates.
Gen 7	Require dust abatement practices when authorizing use on roads.	No	MMI has committed to the following EPMs: • A fugitive dust control program would provide for water application on haul roads and other disturbed areas; chemical dust suppressant application (such as Lignin sulfate or magnesium chloride) where appropriate; and other dust control measures. • Dust generated from the use of roads and excavation activities would be minimized to the extent reasonable and practicable by using BMPs such as minimizing vehicular traffic, and using prudent vehicle speeds. Fugitive emissions in the process area would be controlled at the crusher, and conveyor drop points through the use of bag houses and/or water sprays, where necessary. Other process areas requiring dust and/or emission controls would include the cement/lime silos, ADR Plant, the various ancillary screening and sizing processes, agglomerator, refinery, generators, and the laboratory. Appropriate emission control equipment would be installed and operated in accordance with an NDEP-issued Air Quality Operating Permit.
Gen 8	There is no Gen 8 RDF.	No	-
Gen 9	Upon project completion, reclaim roads developed for project access on public lands unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.	No	Road closure is described in **Section 2.2.19**.
Gen 10	Design or site permanent structures that create movement (e.g., pump jack/ windmill) to minimize impacts on GRSG habitat.	No	These types of structures are not proposed for this Project.
Gen 11	Equip temporary and permanent aboveground facilities with structures or devices that discourage nesting and perching of raptors, corvids, and other predators.	No	MMI has committed to the following EPMs: • Any overhead power lines within four miles of active and pending active leks would be constructed with anti-perching devices, where applicable. Actions would be completed in consideration of the latest Avian Power Line Interaction Committee guidelines with assistance of BLM and NDOW for the appropriate predatory bird anti-perching devices. • Fences in the process area would be continuous, with no breaks, except for gates, that would be kept closed; and smooth or barbed wire would be used above the top horizontal portion of fencing to discourage perching. • MMI would consider obtaining a Raven Depredation Permit from United States Fish and Wildlife Service (USFWS) or submit for coverage under an NDOW permit.

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
Gen 12	Control the spread and effects of nonnative, invasive plant species (e.g., by washing vehicles and equipment, minimize unnecessary surface disturbance; Evangelista et al. 2011). All projects would be required to have a noxious weed management plan in place prior to construction and operations.	No	The *Noxious Weed Plan for the Gold Bar Mine Project, Eureka County, Nevada* (GBE, 2013) was provided as Appendix D of the Plan of Operations. MMI has also committed to the following EPMs: • All vehicle and heavy equipment that may have been exposed to noxious weeds would be cleaned with a power or high-pressure washer prior to entering or leaving the Project mine boundary. Vehicle cleaning would minimize the transport of vehicle-borne weed seed, roots, or rhizomes. • To minimize the transport of soil-borne noxious weed seeds, roots or rhizomes infested soils or material would be stockpiled adjacent to the areas from which they were stripped. Appropriate measures would be taken to avoid wind or water erosion of the affected stockpile. • All interim and final seed mixes, hay, and straw products would be certified weed-free.
Gen 13	Implement project site-cleaning practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of GRSG.	No	The Class III-waivered landfill is described in **Section 2.2.7**. MMI has committed to the following EPM: • During all phases of the Project, all food, waste, and other trash would be placed in closed containers.
Gen 14	Locate project related temporary housing sites outside of GRSG habitat.	No	No temporary housing is proposed for this Project.
Gen 15	When interim reclamation is required, irrigate site to establish seedlings more quickly if the site requires it.	No	Reclamation is described in **Section 2.2.19**.
Gen 16	Utilize mulching techniques to expedite reclamation and to protect soils if the site requires it.	No	The use of mulch in the reclamation is discussed in **Section 2.2.19** and further detailed in the *Conceptual Reclamation/Revegetation Plan for the Gold Bar Project Waste Rock Dumps* (Cedar Creek, 2016), which was provided as Appendix O of the Plan of Operations.
Gen 17	Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.	No	Reclamation is described in **Section 2.2.19**.
Gen 18	When authorizing ground-disturbing activities, require the use of vegetation and soil reclamation standards suitable for the site type prior to construction.	No	Reclamation of disturbed areas resulting from the Project would be completed in accordance with BLM and NDEP regulations.
Gen 19	Instruct all construction employees to avoid harassment and disturbance of wildlife, especially during the GRSG breeding (e.g., courtship and nesting) season. In addition, pets shall not be permitted on site during construction (BLM 2005b).	No	MMI has committed to the following EPM: • New hire and annual refresher training for all employees and contractors would include greater sage-grouse specific protection training that specifically addresses the commitment of MMI to implement the protection program and the need for all employees to avoid harassment and disturbance of greater sage-grouse, especially during the breeding season. MMI would work with NDOW in the development of training materials.
Gen 20	To reduce predator perching in GRSG habitat, limit the construction of vertical facilities and fences to the minimum number and amount needed and install anti-perch devices where applicable.	No	See description for Gen RDF 11.
Gen 21	Outfit all reservoirs, pits, tanks, troughs or similar features with appropriate type and number of wildlife escape ramps (BLM 1990; Taylor and Tuttle 2007).	No	MMI has committed to the following EPM: • All lined ponds would be constructed with escape ramps consisting of textured liner to assist in a safe footing during egress, should any wildlife manage to gain access and inadvertently fall into one of the ponds.
Gen 22	Load and unload all equipment on existing roads to minimize disturbance to vegetation and soil.	No	Equipment would be loaded and unloaded in previously disturbed areas, when practicable.

[1] The proposed Project is a non-discretionary 43 CFR 3809 action; therefore, these RDF's are considered recommendations.

Table 4 Lands and Realty Required Design Features

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
LR 1	Where new ROWs associated with valid existing rights are required, co-locate new ROWs with existing ROWs or where it best to minimizes impacts in GRSG habitat. Use existing roads to access valid existing rights that are not yet developed.	No	Most roads associated with this project are existing and would only be improved for safety and to allow for heavy-haul traffic. Access to the mine would be on existing roads. Roads are described in **Section 2.2.2**.
LR 2	Don not issue ROWs to counties on newly constructed energy/mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.	No	There would be no ROWs issues to counties for this project.
LR 3	Where necessary, fit transmission towers with anti-perch devices (Lammers and Collopy 2007) in GRSG habitat.	No	MMI has committed to the following EPM: • Any overhead power lines within four miles of active and pending active leks would be constructed with anti-perching devices, where applicable. Actions would be completed in consideration of the latest Avian Power Line Interaction Committee guidelines with assistance of BLM and NDOW for the appropriate predatory bird anti-perching devices.

[1] The proposed Project is a non-discretionary 43 CFR 3809 action; therefore, these RDF's are considered recommendations.

Table 5 Fuels and Fire Management Required Design Features

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
WFM 1	Power-wash all fire fighting vehicles, including engines, water tenders, personnel vehicles, and all-terrain vehicles (ATVs), prior to deploying in or near GRSG habitat to minimize the introduction and spread of undesirable and invasive plan species.	No	The *Noxious Weed Plan for the Gold Bar Mine Project, Eureka County, Nevada* (GBE, 2013) was provided as Appendix D of the Plan of Operations. MMI has also committed to the following EPMs: • All vehicle and heavy equipment that may have been exposed to noxious weeds would be cleaned with a power or high-pressure washer prior to entering or leaving the Project mine boundary. Vehicle cleaning would minimize the transport of vehicle-borne weed seed, roots, or rhizomes. • To minimize the transport of soil-borne noxious weed seeds, roots or rhizomes infested soils or material would be stockpiled adjacent to the areas from which they were stripped. Appropriate measures would be taken to avoid wind or water erosion of the affected stockpile. All interim and final seed mixes, hay, and straw products would be certified weed-free.
WFM 2	Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.	No	MMI has committed to the following fire protection EPMs: • As specified by MSHA, MMI would institute a fire protection training program and would have a rehearsed fire suppression plan. A fire protection system would be installed that would incorporate Eureka County and State of Nevada code requirements in the administration and warehouse complexes, truck shop, crushing plant, and process plant. A 250,000-gallon fresh water/fire water tank would be located above the ADR plant, on the south side of the HLP to provide adequate water pressure for the operations and fire suppression system. A rangeland fuel break would be constructed around the facilities. Water trucks, used for dust suppression, would be available in the event of a fire. MMI would promptly comply with any emergency directives and requirements of Eureka County and the BLM pertaining to industrial operations during the fire season. • Light vehicles traveling outside of the main mining areas and along roads that traverse vegetated rangeland during fire season would carry a small water supply in order to control sparks that may be generated by exhaust. Vehicle catalytic converters would be inspected often and cleaned of all brush and grass debris. • When conducting welding operations, they would be conducted in an area free of or mostly free of vegetation. A minimum of 10 gallons of water and a shovel would be on hand to extinguish any fires created from the sparks. Extra personnel would be at the welding site to watch for fires created by welding sparks.
WFM 3	Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planning perennial vegetation (e.g. green-strips) paralleling road right-of-way	No	Reclamation is described in **Section 2.2.19**.

[1] The proposed Project is a non-discretionary 43 CFR 3809 action; therefore, these RDF's are considered recommendations.

Table 6 Locatable Minerals Required Design Features

RDF #	RDF Text	Applicable[1] (Yes/No)	Notes
LOC 1	Install noise shields to comply with noise restrictions (see Action SSS 7) when drilling during the breeding, nesting, brood-rearing, and/or wintering season. Apply GRSG seasonal timing restrictions when noise restrictions cannot be met (See Action SSS 6).	No	Noise modeling completed as part of the analysis does not anticipate noise levels from mining operations (including drilling) to exceed 10 decibels above ambient (**Section 4.21.2**). Additionally, MMI has committed to the following EPMs: • Travel timing restrictions would be implemented during lekking season (March 1 – May 15) on Three Bars Road and Roberts Creek Road, from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM. Emergency and local traffic would be exempt from these restrictions. • Access road work, road maintenance-related work, gravel pit work conducted by MMI within four miles of an active or pending lek are subject to timing restrictions during lekking season (March 1 – May 15) from 6:00 AM to 10:00 AM and from 6:00 PM to 4:30 AM.
LOC 2	Cluster disturbances associated with operations and facilities as close as possible, unless site-specific conditions indicate that disturbances to GRSG habitat would be reduced if operations and facilities locations would best fit a unique special arrangement.	No	Proposed Project facilities are clustered around the existing Atlas Mine.
LOC 3	Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus.	No	Pits are not anticipated to produce pit lakes; therefore, this RDF would not be applicable to this project.
LOC 4	Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat: • Overbuild size of ponds for muddy and non-vegetated shorelines. • Build steep shorelines to decrease vegetation and increase wave actions. • Avoid flooding terrestrial vegetation in flat terrain or low lying areas. • Construct dams or impoundments that restrict down slope seepage or overflow. • Line the channel where discharge water flows into the pond with crushed rock. • Construct spillway with steep sides and line it with crushed rock. • Treat waters with larvicides to reduce mosquito production where water occurs on the surface.	No	Project is not expected to produce any additional water from mining operations. The process solution and event ponds are described in **Section 2.2.6**.
LOC 5	Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.	No	The reclamation plan is described in **Section 2.2.19**.
LOC 6	Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling, and revegetating cut and fill slopes.	No	The reclamation plan is described in **Section 2.2.19**.
LOC 7	Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.	No	Pits are too large for this RDF to be feasible; however, sage-grouse would be able to escape by flight or walking if ever present within the pits.

[1] The proposed Project is a non-discretionary 43 CFR 3809 action; therefore, these RDF's are considered recommendations.