

# **ENVIRONMENTAL ASSESSMENT**

**DOI-BLM-NV-B010-2011-0040-EA**

## **Cove Helen Underground Mine Project**



**February 2013**

**U.S. Bureau of Land Management  
Mount Lewis Field Office  
Battle Mountain District  
50 Bastian Road  
Battle Mountain, Nevada 89820-2332**



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-B010-2011-0040-EA

**AU-REKA GOLD CORPORATION  
COVE-HELEN UNDERGROUND MINE PROJECT  
LANDER COUNTY, NEVADA**

Environmental Assessment  
#DOI-BLM-NV-B010-2011-0040-EA

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## APPENDIX

### Appendix A: BLM Sensitive Species Potential to Occur

## LIST OF ACRONYMS AND ABBREVIATIONS

AADT	annual average daily traffic
ADT	average daily traffic
ABA	acid base accounting
ac-ft	acre-feet
amsl	above mean sea level
AN	acid neutralizing
AP	acid potential
APE	area of potential effect
ATF	U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives
AUM	animal unit month
BAPC	Bureau of Air Pollution Control
BLM	Bureau of Land Management
BMP	best management practice
BMRR	Bureau of Mining Regulation and Reclamation
CaCO <sub>3</sub>	calcium carbonate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CESA	cumulative effects study area
CFR	Code of Federal Regulations
cfs	cubic feet per second
cm/sec	centimeters per second
CO	carbon monoxide
DOAS	Division of Assessment Standards
EA	Environmental Assessment
Echo Bay	Echo Bay Mines, Ltd.
EMT	emergency medical technician
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended
°F	Fahrenheit
ft <sup>2</sup>	square foot
FLPMA	Federal Land Policy and Management Act of 1976
GHG	greenhouse gas
gen set	backup generator
gpm	gallons per minute
GBE	Great Basin Ecology, Inc.
GPS	global positioning system
HDPE	high density polyethylene
HFRA	Healthy Forests Restoration Act of 2003
I-80	Interstate 80
IM	Instruction Memorandum
kV	kilovolt
LCSD	Lander County School District
LCSO	Lander County Sheriff Office
LOS	level of service

MBTA	Migratory Bird Treaty Act of 1918
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
mg/L	milligrams per liter
Mining Law	General Mining Law of 1872, as amended
MLFO	Mount Lewis Field Office
MLRA	Major Land Resources Area
MSHA	Mine Safety and Health Administration
MWMP	meteoric water mobility procedure
NAC	Nevada Administrative Code
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NDE	Nevada Department of Education
NDOA	Nevada Department of Agriculture
NDOT	Nevada Department of Transportation
NDEP	Nevada Division of Environmental Protection
NDETR	Nevada Department of Employment, Training, and Rehabilitation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act of 1969
Newmont	Newmont McCoy Cove Limited
NNHP	Nevada Natural Heritage Program
NNP	net neutralization potential
$\text{NO}_2$	nitrogen dioxide
$\text{NO}_x$	nitrogen oxides
NP	neutralization potential
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NAAQS	National Ambient Air Quality Standards
NSAAQS	Nevada State Ambient Air Quality Standards
NSDO	Nevada State Demographer's Office
$\text{O}_3$	ozone
P.L.	Public Law
PE	polyethylene
pH	potential of hydrogen
Plan	Plan of Operations/Nevada Reclamation Permit Application
$\text{PM}_{2.5}$	particulate matter less than 2.5 microns in size
$\text{PM}_{10}$	particulate matter less than 10 microns in size
PGH	preliminary general habitat
PPH	preliminary priority habitat
PVC	polyvinyl chloride
Project	Cove-Helen Underground Mine Project
RIB	rapid infiltration basin
RFFA	reasonably foreseeable future actions
RMP	Resource Management Plan
ROW	right-of-way
RV	recreational vehicle
SIP	State Implementation Plan

SO <sub>2</sub>	sulfur dioxide
SR	State Route
STIP	State Transportation Improvement Plan
TCP	Traditional Cultural Properties
TDS	total dissolved solids
TOS	temporary ore stockpile
US	United States
USC	United States Code
USDC BEA	United States Department of Commerce Bureau of Economic Analysis
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
V	volt
Victoria	Victoria Resources (US), Inc.
VOC	volatile organic compound
VFD	volunteer fire department
VRM	visual resource management
WPCP	Water Pollution Control Permit
WRDF	waste rock disposal facility
yd <sup>3</sup>	cubic yards

# COVE-HELEN UNDERGROUND MINE PROJECT ENVIRONMENTAL ASSESSMENT

## 1 INTRODUCTION / PURPOSE OF AND NEED FOR ACTION

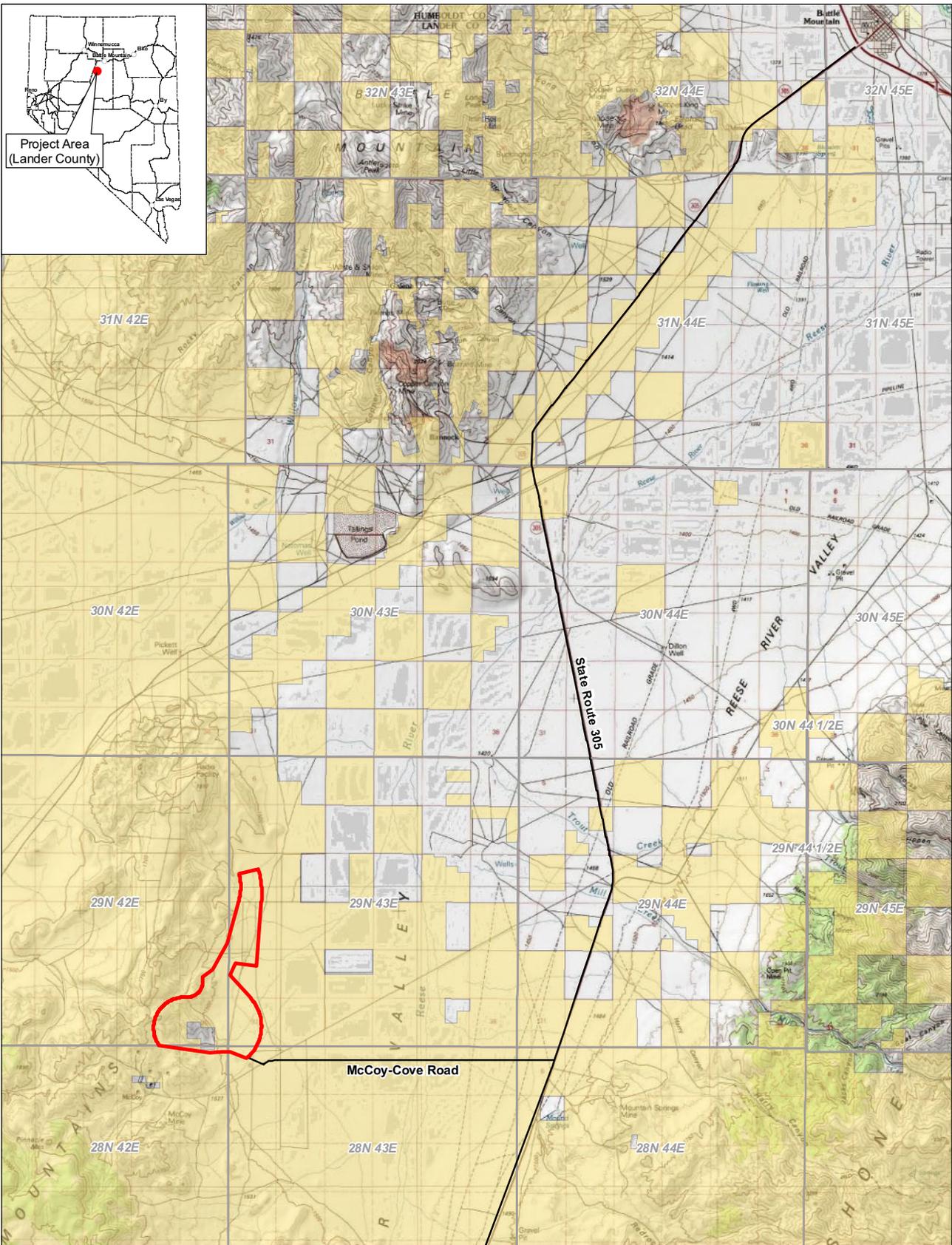
### 1.1 Introduction

Au-Reka Gold Corporation (AGC), a wholly owned subsidiary of Premier Gold Mines Limited, plans to conduct surface exploration and underground drilling and bulk sampling activities at the Cove-Helen Underground Mine Project (Project) located in north-central Nevada approximately 26 miles south of Battle Mountain, Nevada, in Lander County. The Project is located on public lands administered by the United States (US) Bureau of Land Management (BLM), Mount Lewis Field Office (MLFO) that consists of seven claims owned by Newmont McCoy Cove Limited (Newmont) and leased to AGC. The Project is located within Sections 25, 35, and 36, Township 29 North, Range 42 East (T29N, R42E); Section 1, T28N, R42E; Sections 18, 19, 30, and 31, T29N, R43E; and Section 6, T28N, R43E, Mount Diablo Base and Meridian (Project Area). The site is accessed by traveling south from Battle Mountain approximately 22 miles on Nevada State Route 305 and then west approximately seven miles on the McCoy/Cove Mine Road to the Project site. The Project location, access, and land status are shown on Figure 1.1.1.

Echo Bay Mines, Ltd. (Echo Bay) first conducted mining in the area at the McCoy/Cove Mine between 1987 and 2001. In 2003, Newmont acquired the mining claims, but the property has been in closure since 2006. Victoria Resources (US), Inc. (Victoria) discovered the Helen Zone in 2007 during a surface exploration drilling program (Notice No. NVN-087927) and has since sold the Project to AGC. Based on preliminary drilling information, the Helen Zone is a gold ore deposit consisting of an upper and lower high-grade zones. These zones are comprised of horizontal bedding controlled and steeply dipping structurally controlled mineralization. Preliminary information indicates that the Helen Zone is a potential high-grade deposit amenable to underground mining. The Helen Zone is located approximately 2,000 feet northwest of the Cove Mine open pit. The Helen Zone is overlain by approximately 600 feet of volcanic rocks.

A Plan of Operations #NVN-088795/Nevada Reclamation Permit Application (Plan) was submitted to the BLM and the Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) in accordance with BLM Surface Management Regulations 43 Code of Federal Regulations (CFR) 3809, as amended, and Nevada reclamation regulations at Nevada Administrative Code (NAC) 519A. AGC proposes to conduct activities that would consist of the following: surface exploration activities, underground portal and workings construction; surface support facilities construction; mining and diamond drilling; bulk sample collection; development water management; and portal and workings closure and reclamation. A maximum of 120,000 tons of ore would be removed and tested over the life of the Project. This ore would be transported off site to either the Jarrett Canyon or Newmont Carlin Mill 6 facility for metallurgical testing. AGC would locate the majority of the new surface support facilities in previously disturbed areas or reclaimed surfaces, including using the former locations of the Rapid Infiltration Basins (RIBs) associated with the former McCoy/Cove Mine operations.

The Project Area measures approximately 2,474 acres in which all of the proposed surface and underground activities would occur. The Plan proposes to create a total of 465.32 acres of Project-related disturbance, which includes the following: 330.27 acres of surface facility disturbance; 30.11 acres of existing disturbance (currently the responsibility of Newmont to reclaim); 4.94 acres of existing Notice-level surface exploration disturbance (#NVN-087927); and an additional 100.00 acres of surface exploration disturbance.



**Explanation**

- Project Boundary
- Access Roads

**Land Status**

- Bureau of Land Management
- Bureau of Reclamation
- Private Land

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 Mount Lewis Field Office LLNVB0100  
 50 Bastian Road  
 Battle Mountain, Nevada 89820

**BUREAU OF LAND MANAGEMENT**

**COVE-HELEN UNDERGROUND MINE PROJECT**

**General Location, Access, and Land Status Map**

Figure 1.1.1

01/17/2013



## **1.2 Existing Activities and Disturbance**

Although the McCoy/Cove Mine is in closure status, Newmont still uses and maintains existing infrastructure and facilities within the Project Area that include the following major components:

- Main access road;
- Small vehicle mine roads including berms;
- Haul roads and pit haul ramp;
- Water storage tank and yard;
- Communications tower yard;
- Fuel and generator containment;
- Dewatering line/ powerline;
- Non-potable water and power supply lines;
- Basins;
- Fencing;
- Fuel and generator containment;
- Drainage channels; and
- Lay down yard.

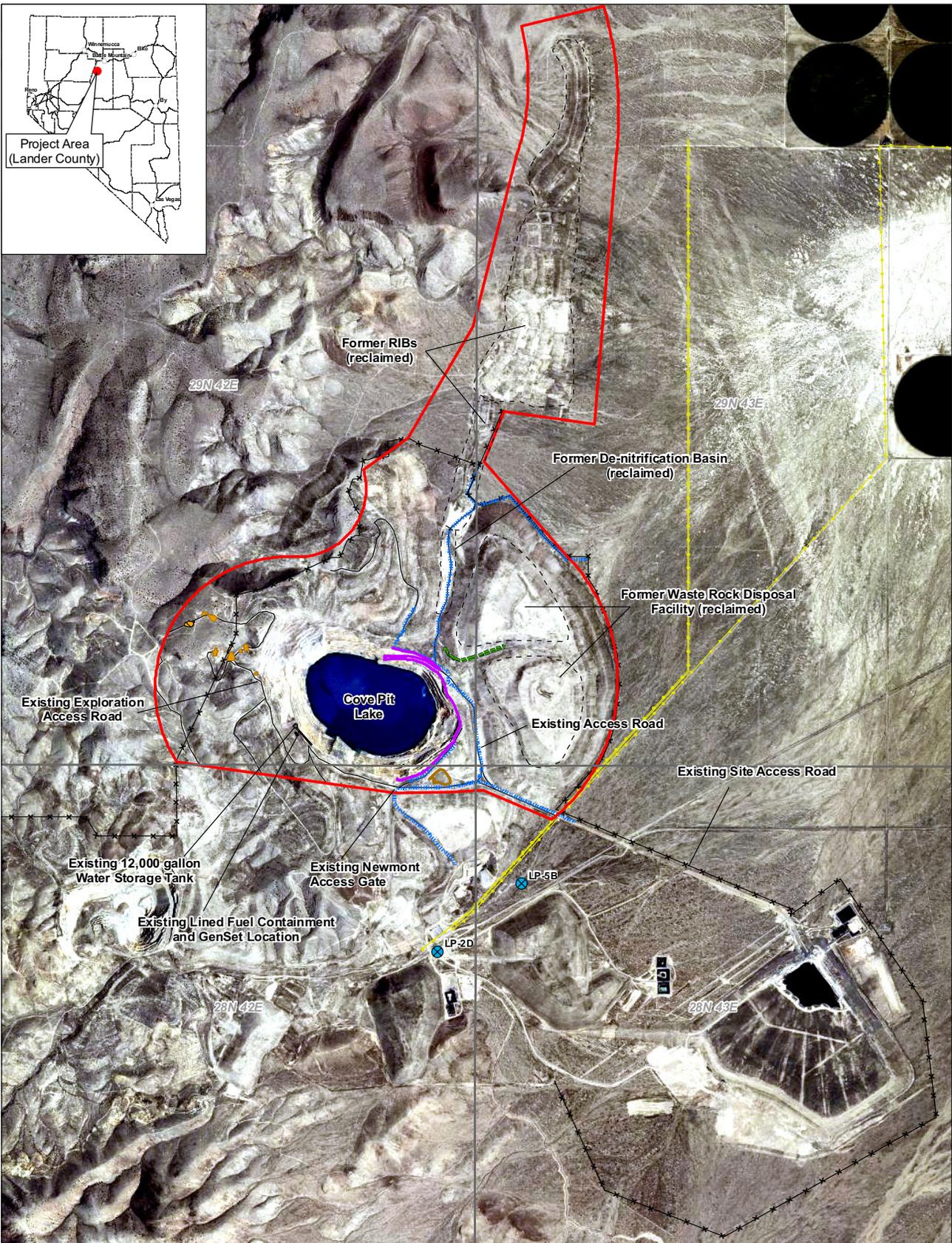
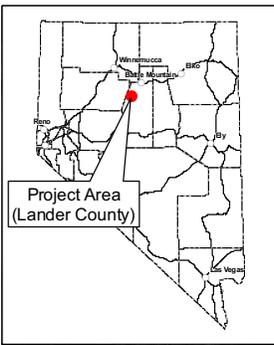
AGC currently has a Notice (NVN-087927) under which the drilling responsible for identifying the Helen Zone resource was conducted. This Notice would become part of the Plan to allow the reclamation of the exploration work to be conducted under the Plan. The Notice included the construction of drill roads, drill pads, and sumps. The surface disturbance associated with the Notice-level exploration activities totals 4.94 acres and is shown on Figure 1.1.2.

## **1.3 Purpose of and Need for Action**

On lands open to location under the General Mining Law of 1872, as amended (Mining Law), the BLM administers the surface of public land and federal subsurface mineral estate under the Mining Law and the Federal Land Policy and Management Act of 1976 (FLPMA). The FLPMA also governs BLM's administration of public land not open to location under the Mining Law.

The purpose of the Proposed Action is to authorize AGC's proposal to explore, locate, and delineate precious metal (gold) deposits on its mining claims on public lands, as provided under the General Mining Law of 1872. The need for the action is established by the BLM's responsibility under Section 302 of the FLPMA and the BLM Surface Management Regulations at 43 Code of Federal Regulations (CFR) 3809 to respond to a plan of operations to allow an operator to prospect, explore, and assess locatable mineral resources on public lands, and take any action to prevent unnecessary or undue degradation of the public lands.

The decision the BLM would make based on the National Environmental Policy Act of 1969 (NEPA) includes the following options: 1) Approve the Plan with no modifications; 2) Approve the Plan with additional mitigation measures that are needed to prevent unnecessary or undue degradation of public lands; or 3) Deny the approval of the Plan as currently written and not authorize the Project if it is found that the Proposed Action does not comply with the 3809 regulations and the FLPMA mandate to prevent unnecessary or undue degradation.



**Explanation**

- ▭ Project Boundary
- ▬▬▬▬ Drainage Channel
- x-x- Fencing
- ▬ Pit Berm
- ▬ 125 kV Transmission Line
- ▬▬▬▬ Rock-lined Drainage Channel
- ▬▬▬▬ Gravel/Aggregate Laydown Yard
- ▬▬▬▬ Existing Roads
- ▬▬▬▬ Reclaimed Facilities
- ⊗ Existing Monitoring Well
- ▭ Existing/Authorized Notice-Level Disturbance
- ▭ Existing/Authorized Notice-Level Disturbance (Reclaimed and Released)

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Mount Lewis Field Office LLNVB0100  
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**COVE-HELEN UNDERGROUND MINE PROJECT**

**Existing Facilities and Surface Disturbance**

Figure 1.1.2

01/16/2013

## **1.4 BLM Responsibilities and Relationship to Planning**

The BLM is responsible for the preparation of this Environmental Assessment (EA), which was prepared in conformance with the policy guidance provided in the BLM NEPA Handbook H-1790-1 (BLM 2008). Under 43 CFR 3809.415, the operator of a plan of operations must prevent unnecessary or undue degradation to the public lands.

### **1.4.1 Shoshone-Eureka Resource Management Plan**

The Proposed Action conforms with the BLM's Shoshone-Eureka Resource Management Plan, as amended (RMP) dated February 26, 1986 (BLM 1986a). Specifically, on page 29 in the RMP Record of Decision, 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," 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," "Current Mineral Production Areas," number 5:

"Recognize these areas as having a highest and best use for mineral production and encourage mining with minimum environmental disturbance..."

### **1.4.2 Local Land Use Planning and Policy**

The Lander County 2005 Policy Plan for Federally Administered Lands (originally developed between 1983 and 1984) was developed 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. Policy 13-1 states: "Retain existing mining areas and promote the expansion of mining operations and areas."

## **1.5 Scoping and Issues**

The Project was internally scoped by the BLM interdisciplinary team at a meeting held on January 18, 2011 and then again on August 15, 2012, at the BLM office in Battle Mountain. During this meeting, BLM personnel identified the elements associated with supplemental authorities and other resources and uses to be addressed in this document as outlined in Chapter 3.

The following specific issues related to the Proposed Action were identified:

- Air Quality;
- Cultural Resources;

- Fire Management;
- Geology and Mineral Resources;
- Land Use and Realty;
- Migratory Birds;
- Native American Traditional Values;
- Noxious Weeds, Invasive and Nonnative Species;
- Paleontological Resources;
- Rangeland Management;
- Socioeconomic Values;
- Soils;
- Special Status Species;
- Transportation and Access;
- Vegetation;
- Visual Resources;
- Wastes, Hazardous or Solid;
- Water Resources; and
- Wildlife.

On March 31, 2011, the BLM sent a letter to notify the Native American Tribes with known interests in the area. A site visit was conducted on June 16, 2011 with the Duckwater Tribe. On August 24, 2012, the BLM notified the same Tribes of the operator change from Victoria to AGC.

## **2 DESCRIPTIONS OF THE PROPOSED ACTION AND ALTERNATIVES**

### **2.1 Proposed Action**

#### **2.1.1 Project Overview**

AGC proposes to conduct activities that would consist of the following: surface exploration activities, underground portal and workings construction; surface support facilities construction; mining and diamond drilling; bulk samples collection; development water management; and portal and work closure and reclamation. The underground work would include the following: construction of up to 4,600 feet of decline; drifts; crosscuts; drill stations; winzes (an opening in the underground mine that is sunk downward, and its top is located underground); ventilation lines; powerlines; and to conduct bulk sampling and testing in stages. A maximum of 120,000 tons of ore would be removed and tested over the life of the Project. This ore would be transported off site to either the Jarrett Canyon or Newmont Carlin Mill 6 facility for metallurgical testing. AGC would locate the majority of the new surface support facilities in previously disturbed areas or reclaimed surfaces, including using the former locations of the RIBs associated with the former McCoy/Cove Mine operations. The Project would occur in four stages as described below.

#### Surface Exploration Stage

AGC would conduct surface exploration activities to gather data to further support the construction of the underground facilities and define the underground resource. The majority of the 100 acres of surface exploration activities would occur during the first two years of the Project, but drilling activities would also continue through the life of the Project. The surface exploration would be conducted in phases.

#### Underground Stage 1

Underground Stage 1 of the Project would include the construction of the surface support facilities and entry portal on the northeast side of the Cove Mine Pit at approximately 4,700 feet above mean sea level (amsl). A drift would be driven northwest from the entry portal for approximately 100 feet. From this point, a decline would be driven west approximately 3,700 feet at a minus 15 percent grade to the 4,145-foot amsl level. The estimated rate of advancement would be approximately 18 feet per day, which would require approximately eight months to advance from the collar (portal) to the end of the decline. From this location, a crosscut would be driven to intersect the mineralized zones and to provide a drill platform from which to conduct approximately 40,000 feet of exploration diamond drilling and conduct bulk sampling. It is anticipated that up to 15,000 tons of ore would be collected in one bulk sample during Stage 1. Stage 1 would take approximately two years to complete. Section 2.1.4 of this EA provides a more detailed description of the proposed surface facilities and activities associated with Stage 1.

#### Underground Stage 2

Underground Stage 2 of the Project would include a 900-foot ramp driven down to the 4,040-foot amsl level. Crosscuts within the mineralized zones would be developed at the 4,040-foot amsl level to provide bulk samples of the mineralized material as well as to create stations for an additional 40,000 feet of diamond drilling. Stage 2 is anticipated to require three months for

construction of the ramp and 800 feet of crosscuts and approximately one year for the drilling program. The minus 15 percent grade ramp has been designed in a figure eight configuration to provide additional information about the mineralization. It is anticipated that up to 15,000 tons of ore would be collected in one bulk sample during this stage. Section 2.1.5 of this EA provides additional details regarding the ramp construction and underground activities.

### Underground Stage 3

Underground Stage 3 of the Project would include a total of 800-feet of lateral underground development. This stage would involve up to an additional 80,000 feet of diamond drilling. During this stage, it is anticipated that up to a total of 90,000 tons of ore would be collected in six different bulk samples, at approximately 15,000 tons each.

Table 2.1-1 outlines the Project stages, associated activities, quantities of materials generated and estimated timeline.

**Table 2.1-1: Project Stages, Activity, Ore and Waste Quantities, and Timing**

Project Activity	Description	Duration (Months)	Underground Development Footage	Waste Material (tons)	Ore (tons)
Surface Exploration	100 acres of surface drilling and sampling	24-59	0	0	0
Underground Stage 1	Development of Surface Facilities, Establishment of Infrastructure	4-6	0	0	0
	Decline to 4,145-foot level	9-12	3,700	70,000	0
	Drifting/Crosscuts/Collect Bulk Sample #1	4-6	1,400	12,000	15,000
Underground Stage 2	Decline to 4,040-foot level	3-5	900	17,000	15,000
	Drifting/Crosscuts/Collect Bulk Sample #2	4-6	800		
Underground Stage 3	Collect Bulk Sample #3	3-4	800	0	15,000
	Collect Bulk Sample #4	3-4	800	0	15,000
	Collect Bulk Sample #5	3-4	800	0	15,000
	Collect Bulk Sample #6	3-4	800	0	15,000
	Collect Bulk Sample #7	3-4	800	0	15,000
	Collect Bulk Sample #8	3-4	800	0	15,000
<b>Total</b>		<b>42-59</b>	<b>11,600</b>	<b>99,000</b>	<b>120,000</b>

### **2.1.2 Estimated Acreage of Proposed Disturbance**

The Plan proposes to create a maximum of 330.27 acres of disturbance (primarily on previously disturbed and reclaimed areas), utilize 30.11 acres of existing facilities, include 4.94 acres of existing surface disturbance from the exploration Notice, as well as 100 acres of new surface exploration disturbance, for a total of 465.32 acres of Project-related surface disturbance. The existing and proposed surface disturbance is summarized in Table 2.1-2.

**Table 2.1-2: Existing and Proposed Cove-Helen Project Surface Disturbance**

Project Component	Existing/ Authorized Disturbance	Proposed Phase I Disturbance	Proposed Future Phases	Total Disturbance
<b>Surface Exploration</b>				
Drill Pads (including sumps)	2.65	19.14	50.00	71.79
Drill Spur Roads (14-foot)	1.61	1.67	5.30	8.58
Drill Roads (18-foot)	0.68	4.53	12.30	17.51
Overland Travel	0	0	7.06	7.06
<b>Total Surface Exploration Acres</b>	<b>4.94</b>	<b>25.34</b>	<b>74.66</b>	<b>104.94</b>
<b>Roads and Berms</b>				
Main Access Road	0.55	1.08	0	1.63
Small Vehicle Mine Roads	12.87	16.62	0	29.49
Haul Roads/Ramps	6.52	0	1.78	8.30
<b>Total Roads and Berm Acres</b>	<b>19.94</b>	<b>17.70</b>	<b>1.78</b>	<b>39.42</b>
<b>Parking Areas, Yards, and Buildings</b>				
Parking Areas	0	0.61	0	0.61
Yards	0.13	2.70	0	2.83
Buildings	0	0.38	0	0.38
<b>Total Parking Areas, Yards, and Buildings Acres</b>	<b>0.13</b>	<b>3.69</b>	<b>0.00</b>	<b>3.82</b>
<b>Ponds and Basins</b>				
Evaporation Pond	0	0	1.35	1.35
RIB 1A	0.01	0	7.64	7.65
RIB 1B	0.01	0	11.39	11.40
RIB C	0	0	39.67	39.67
RIB D	0	0	39.67	39.67
RIB E	0	0	39.67	39.67
Sedimentation Basins	0.25	0	3.34	3.59
Surge Ponds for Water Treatment Plant	0	0	1.00	1.00
<b>Total Ponds and Basin Acres</b>	<b>0.27</b>	<b>0.00</b>	<b>143.73</b>	<b>144.00</b>
<b>Stockpiles, Dumps, and Cut Slopes</b>				
Temporary Ore Stockpile	0	0	2.81	2.81
Waste Rock Dump Facility	0	0	4.19	4.19
Growth Media Stockpiles	0	0	55.82	55.82
Excavated Soil and Rock Stockpiles	0	0	82.93	82.93
Gravel and Aggregate Stockpile	2.76	0	0	2.76
Cut slopes	0	0	6.52	6.52
<b>Total Stockpiles, Dumps, and Cut Slopes Acres</b>	<b>2.76</b>	<b>0.00</b>	<b>152.27</b>	<b>155.03</b>
<b>Ancillary Facilities</b>				
Electrical and Water Lines	0.81	0.69	3.74	5.24
Ground Water Monitoring Well Pads	0	0.15	0	0.15
Water Treatment Plant Facility	0	0	1.63	1.63
Containment Areas	0.02	0	0.39	0.41
Water Storage Tank	0.15	0	0	0.15
Fencing	2.95	0	2.02	4.97
Other	0	0.03	0	0.03
<b>Total Ancillary Facilities Acres</b>	<b>3.93</b>	<b>0.87</b>	<b>7.78</b>	<b>12.58</b>
<b>Channels and Culverts</b>				
Rock-lined Channels	2.66	0	1.66	4.32
Trapezoidal and Weir Channels	0.42	0	0.55	0.97
Piping (Trenching)	0	0.12	0.12	0.24
<b>Total Channels, Ditches, and Culverts Acres</b>	<b>3.08</b>	<b>0.12</b>	<b>2.33</b>	<b>5.53</b>
<b>Total</b>	<b>35.05</b>	<b>47.72</b>	<b>382.55</b>	<b>465.32</b>

### 2.1.3 Surface Exploration

AGC proposes an additional 100 acres of surface exploration. All surface exploration activities would be conducted within the Project Area. The surface exploration activities would be implemented in a phased manner. As outlined in Table 2.1-2, Phase I activities under the Plan would create 25.34 acres of surface disturbance. Phase I activities would consist of exploration drilling of a total of 58 sites (19.14 acres), the construction of 13,638 linear feet (6.20 acres) of exploration drill roads and spur roads, and the use of some of the existing roads. The existing roads are accounted for in Section 2.1.4.7 as they would be used to access the proposed surface facilities. All Phase I proposed activities and existing Notice-level exploration disturbance within the Project Area are shown on Figure 2.1.1. Any changes in Phase I surface disturbance, as shown in Figure 2.1.1, would require additional approval by the BLM.

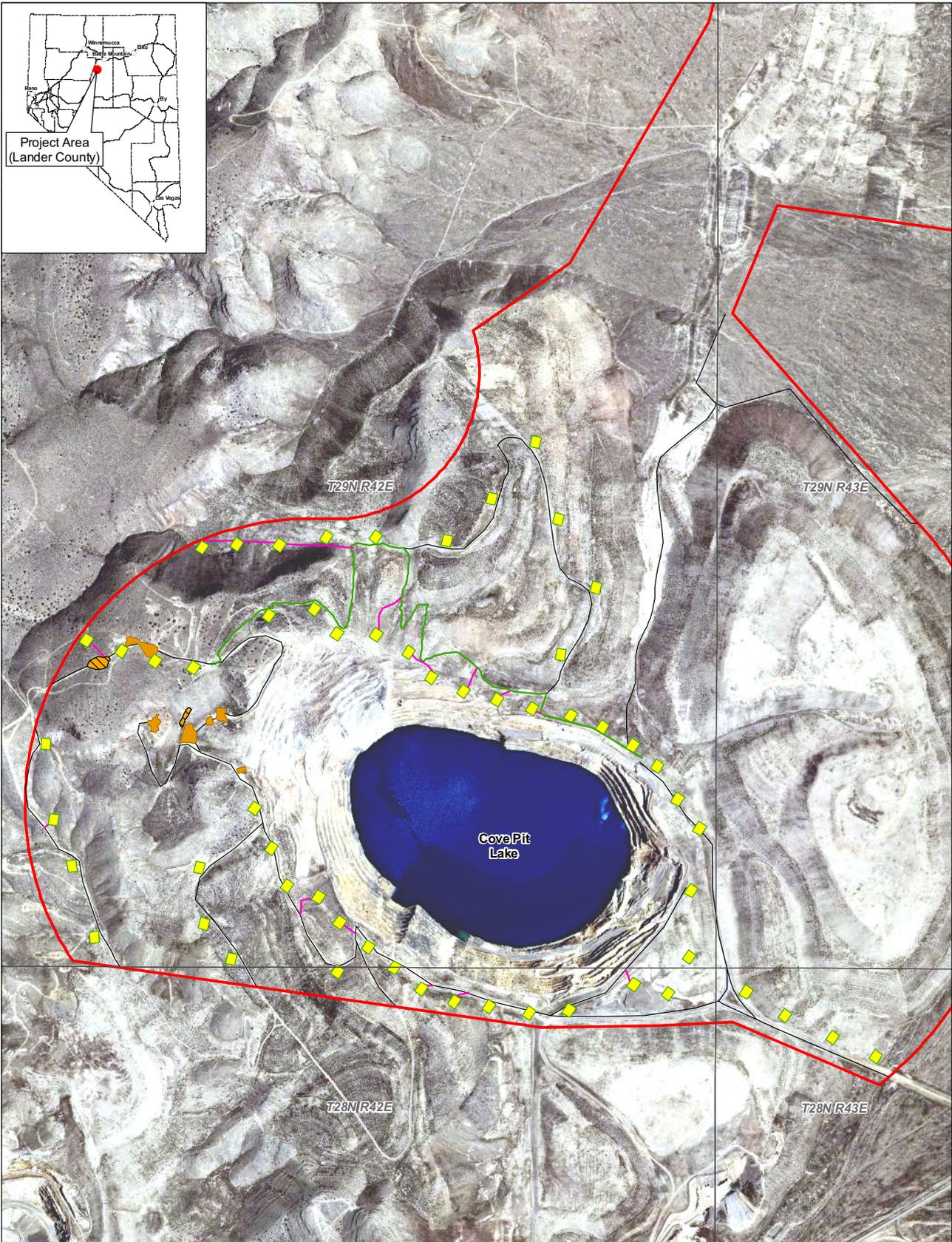
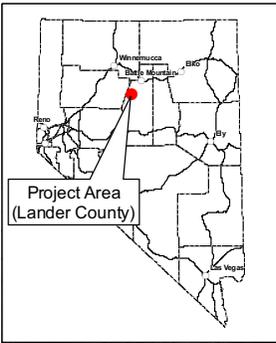
The remaining 74.66 acres of disturbance would occur in subsequent phases over the next five years. Locations of the disturbance in Phase I and subsequent phases would be based on the results of prior exploration activities. By using this phased approach to drilling, AGC would assess the expansion needs of the Project based on previous drill results. In order to provide the BLM and BMRR relevant data concerning surface disturbance, a map would be submitted showing subsequent phases for review and approval by the BLM per 43 CFR 3809.432 (b) prior to any additional surface disturbance.

Once a phase has been approved by the BLM, any changes in locations of surface disturbing activities of that phase would require approval by the BLM. Any changes in an approved phase of the Project requested by the operator would not result in an exceedance of the approved acreage for that phase of the Project. In addition, AGC would provide to the BLM and BMRR an annual report, or work plan, on, or before, April 15<sup>th</sup> of each year that would document surface disturbance locations, types of surface disturbance, and any completed concurrent reclamation.

#### 2.1.3.1 Drill Road Construction and Overland Travel

AGC would, to the extent practicable, utilize existing roads for access. During Phase I, it is estimated that approximately 13,638 linear feet (6.20 acres) of new drill roads and drill spur roads would be constructed (average of 11 to 25 percent slope). All construction activities would be consistent with applicable BLM approved Best Management Practices (BMPs). When new drill road construction is necessary, main drill roads would be built with approximately 18-foot running widths including the safety berm, as required by Mine Safety Health Administration (MSHA), and spur roads would be built with 14-foot running widths including the safety berm. Road construction would occur in areas with varying topography. As a result, the disturbance widths for the main drill roads would vary between approximately 19 feet and 40 feet, and the spur roads would vary between approximately 15 feet and 31 feet as outlined in Table 2.1-3.

Road construction would be performed with a dozer and would occur intermittently throughout the life of the Project. As previously stated, AGC would utilize existing roads to the extent practicable; however, alternate road locations may be determined in the field based on geologic information collected during the exploration program. Alternate road locations would need to be approved by the BLM before starting their construction. Road grades would be kept to an average of ten percent or less to minimize erosion. Where steeper grades are unavoidable, water bar spacing would not exceed 400 feet. Water bar spacing on flatter slopes would average 300 to 400 feet or at a distance approved by the BLM.



**Explanation**

- ▭ Project Boundary
- ▭ Proposed Drill Pads
- ▭ Existing/Authorized Notice-Level Disturbance
- ▭ Existing/Authorized Notice-Level Disturbance (Reclaimed and Released)
- Proposed Drill Road (18-foot wide)
- Proposed Drill Spur Roads (14-foot wide)
- Existing Roads

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 Mount Lewis Field Office LLNVB0100  
 50 Bastian Road  
 Battle Mountain, Nevada 89820



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**BUREAU OF LAND MANAGEMENT**

**COVE-HELEN UNDERGROUND MINE PROJECT**

**Proposed Phase I Surface Exploration Disturbance**

**Figure 2.1.1**



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**Table 2.1-3: Constructed Road Slope Angles and Average Disturbance Widths**

Road Category % Slope	Measured % Slope	Running Width (Feet)	Disturbance Width (Feet)
Road 1: 0 – 10%	5	14	14.8
Road 2: 11 – 25%	15	14	16.6
Road 3: 26 – 45%	35	14	22.4
Road 4: >45%	50	14	31.2
Road 1: 0 – 10%	5	18	19.0
Road 2: 11 – 25%	15	18	21.3
Road 3: 26 – 45%	35	18	28.7
Road 4: >45%	50	18	40.2

Maintenance of exploration roads would include minor seasonal regrading and reestablishment of water bars as necessary, as outlined in the BLM Manual 9113. Erosion control would be monitored in the spring and fall or after any significant precipitation event. Maintenance of existing roads would not increase the surface disturbance within the Project Area and would consist of smoothing rutted surfaces and holes on existing access and drill roads. Maintenance would not increase the surface disturbance area. If road gravel is necessary to improve some of the roads in the Project Area, the gravel would be obtained from a BLM approved source. The gravel would be placed on the road by a dump truck and smoothed by a road grader.

Overland travel would be used to access drill sites instead of constructing drill roads when feasible. Overland travel routes would be approximately ten feet wide to accommodate the track widths on the track mounted drill rig. No overland travel is proposed in Phase I.

#### 2.1.3.2 Drill Site Construction

New drill site disturbance would be kept to the minimum size necessary to ensure safe access and a safe working area for equipment and crew. Sumps would be constructed as necessary within the drill site disturbance to collect drill cuttings and manage drilling fluids. Drill site construction within ephemeral drainages would be avoided. Exceptions could be made during dry summer months when no water is present. The disturbance would then be reclaimed prior to the occurrence of seasonal flows in those drainages. During Phase I, it is anticipated that AGC would conduct exploration drilling from 58 drill sites utilizing an average of three drill rigs up to a maximum of seven drill rigs (three to six core rigs and one truck-mounted reverse circulation rig).

Drill sites would each measure approximately 130 feet by 110 feet or an average of 1,430 square feet (approximately 0.33 acre). The drill sites and sumps would be constructed in areas with varying topography; therefore, the pads were oversized to account for any topographical variability and the pads would not exceed 0.33 acre each. Surface disturbance would vary based on the slope of the terrain where the sites are constructed. Sump disturbance would be constructed within the drill site disturbance and would be 40 feet by 20 feet by ten feet deep. The total proposed Phase I disturbance associated with the construction of drill site construction would total approximately 19.14 acres, including sump disturbance.

Drill holes would be both vertical and angled with average drill depths of approximately 2,000 to 5,000 feet. Up to five pre-collar holes would be drilled with a reverse circulation rig then completed with a core rig. Cuttings not bagged and removed during sample collection would be

used as a source of backfill and placed back down the borehole. All drill holes, except the five pre-collar holes, would be plugged prior to the drill rig moving from the drill site in accordance with Nevada Revised Statute (NRS) 534, NAC 534.4369, and NAC 534.4371. If ground water is encountered, the drill holes would be plugged pursuant to NAC 534.420.

Only water or nontoxic drilling fluids would be utilized, as necessary, during drilling. During Project activities, water use would average approximately 2,000 to 3,000 gallons per day for dust suppression. Water would be pumped from the Cove Pit Lake under AGC's existing water rights.

Standard drilling procedures usually require a geologist to be on site throughout Project-related drilling activities. The duties of the geologist generally include sitting the drill rig, logging each hole according to the geologic features encountered, determining the maximum depth of each hole, and advising the drill operator as needed. The geologist usually travels to and from the drill site in a separate four-wheel drive pickup truck.

A standard drill rig crew usually consists of a drill operator and one to two helpers (two to three man crew). The helpers remove and box the recovered core or rotary samples and cuttings from reverse circulation and core rigs, mix drilling fluids in the portable mud tank, operate the water truck, assist with drilling operations, and conduct maintenance as necessary. The crew would be transported to and from the drill site in four wheel drive vehicles. Over the life of the Project, up to seven drill rigs (reverse circulation and core) are expected to be in operation at the Project Area at any time. The Phase I activities for this Project would use two core drill rigs. The work force would consist of two geologists, two drill crews, one operator for the dozer, and one operator for the track hoe. Drilling activities would generally be conducted 24 hours per day, seven days a week.

All equipment would be properly muffled and equipped with suitable and necessary fire suppression equipment, such as fire extinguishers and hand tools. All Project-related traffic would observe prudent speed limits to enhance public safety, protect wildlife and livestock, and minimize dust emissions. All activities would be conducted in conformance with applicable federal and state health and safety requirements.

All Project-related refuse would be disposed of on a daily basis consistent with applicable regulations. No refuse would be disposed of on site. In the event that hazardous or regulated materials such as diesel fuel are spilled, measures would be taken to control the spill and the NDEP and BLM would be notified. A Spill Contingency Plan has been prepared that outlines procedures in case of a spill and is located in Appendix D of the Plan. All drill holes would be abandoned in accordance with applicable federal and state standards as set forth and discussed in detail in the Plan.

#### **2.1.4 Surface Facilities**

AGC proposes to use and take over the maintenance of the following existing facilities currently maintained by Newmont:

- Main access road;
- Small vehicle mine roads including berms;

- Haul roads and pit haul ramp;
- Water storage tank and yard;
- Communications tower yard;
- Fuel and generator containment;
- Dewatering line/ powerline;
- Non-potable water and power supply lines;
- Basins;
- Fencing;
- Fuel and generator containment;
- Drainage channels; and
- Lay down yard.

Figure 1.1.2 shows the existing facilities and Table 2.1-2 outlines the disturbance acreages associated with these facilities. AGC would need to modify or upgrade some of these facilities and infrastructure to support the Project, which includes widening or extending some of the existing access roads, the perimeter road, and haulage routes. The road widening and extension activities would create new surface disturbance associated with the Project measuring approximately 10.89 acres. AGC is currently undergoing discussions with Newmont regarding the disposition of existing facilities. AGC would be responsible for the reclamation of the facilities within the Project Area boundary.

Proposed new surface support facilities would generally be located on previously disturbed and reclaimed areas and would include but not be limited to the following:

- Security guard entrance building and office buildings;
- Employee and visitor parking lot;
- Temporary maintenance shop, wash bay, and pump house;
- Transmission lines and service connections;
- Electrical transformers and substation;
- Backup generators (gen sets);
- Water supply and disposal systems;
- Fuel and lubricant storage area;
- Explosives storage area;
- Growth media stockpiles and excavated soil and rock stockpiles;
- Monitoring wells;
- Additional access roads, emergency roads, and haul roads;
- Sediment basins;
- Surge ponds;
- Water treatment plant;
- RIBs;
- Double-lined evaporation pond;
- Waste Rock Disposal Facility (WRDF); and
- Lined temporary ore stockpile (TOS) and load-out area.

Figure 2.1.2 presents a plan view of the proposed Project surface development and Table 2.1-2 summarizes the acreage of disturbance associated with these proposed facilities. The following sections describe some of these proposed Project components in further detail.

#### 2.1.4.1 Buildings and Structures

A security guard/entrance building would be located at the entrance to the site and would be constructed with a pre-fabricated building placed on blocks over a compacted gravel surface. A new 1,100-foot section of free standing barbed wire fence associated with the security building would be constructed. The building would be 12 feet by 12 feet by ten feet. An employee and visitor parking lot would be located adjacent to the security building and the existing access road. The parking lot would be compacted gravel with a tire ditch and would accommodate approximately 60 vehicles. Workers would be transported to the portal, offices, and shop via vans from the parking area.

Office buildings would be located on the north side of the Cove Pit Lake. There would be three pre-fabricated buildings, two of these would measure 24 feet by 50 feet by ten feet, and one would measure 12 feet by 50 feet by ten feet. The buildings would be placed on blocks over a compacted gravel surface. Limited parking for light vehicles would be located at the office complex.

A temporary maintenance shop and wash bay would be located opposite the office complex. The shop, wash bay, and pump house would have a concrete floor, sump, and collection/drain system. The maintenance shop and wash bay would be metal shell buildings.

A pump house would be a prefabricated shed to shelter the pumps and provide monitoring ports. This building would have a concrete floor.

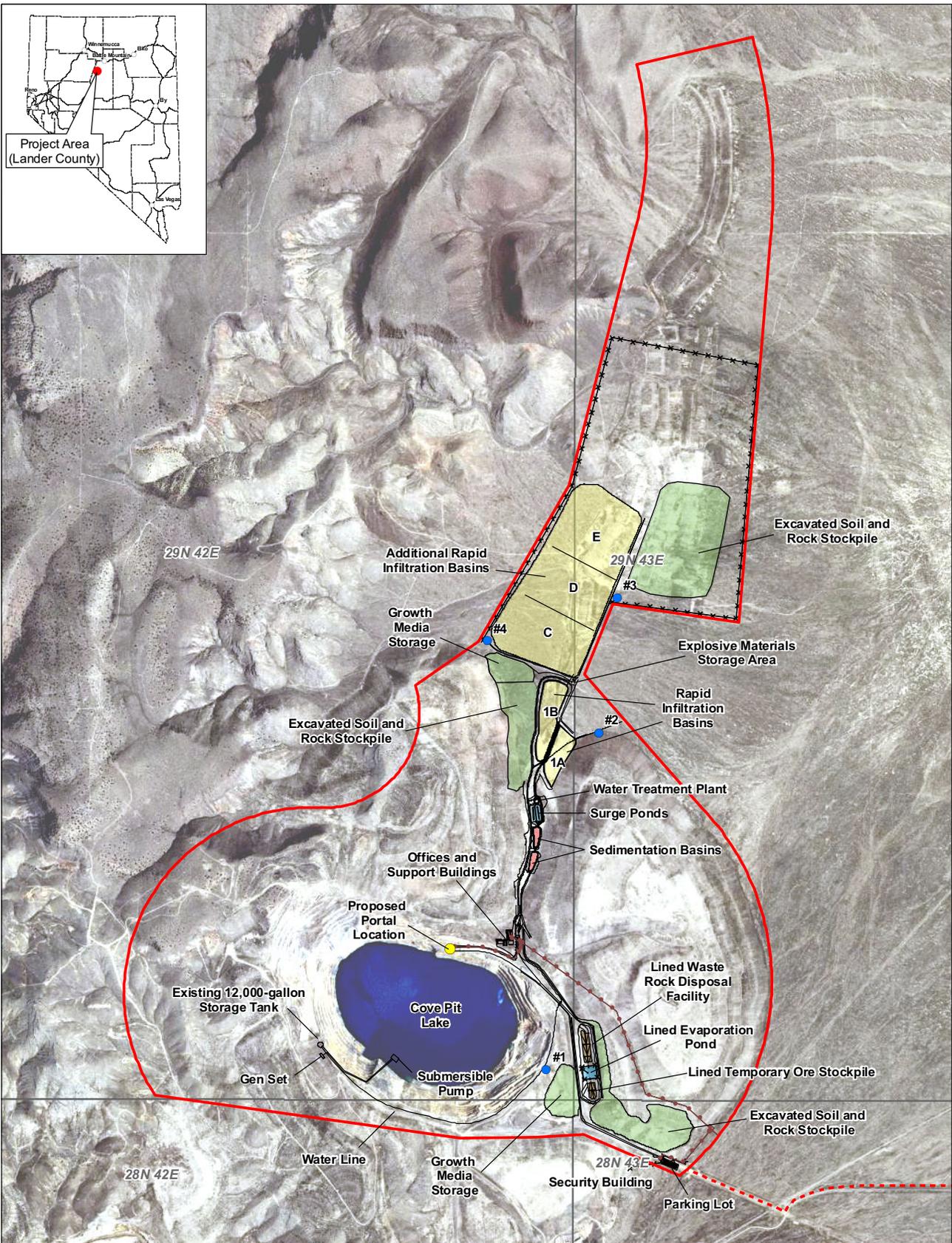
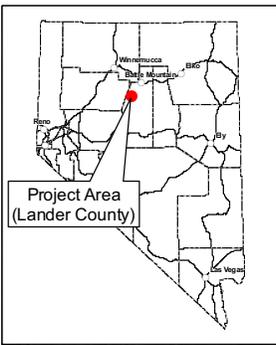
#### 2.1.4.2 Power Supply System

An existing 120-kilovolt (kV) transmission line currently provides electrical power to the Newmont facilities (offices and shop at McCoy/Cove Mine). A service connection from this existing line would be installed near the security entrance to the site. The power would then be transmitted to the security office, shop, wash bay, office complex, pump house, and decline. The internal power would be distributed by overhead transmission lines, except for power in the decline, which would be via cable installed in the arched back of the decline. Power from this 120-kV line would be stepped down to a 4160-volt (V) line at a substation and transformer located near the office building. Transformers would be used to bring the line down to the 440-V line as needed.

Backup generators (gen sets) would be located near the pump house and wash bay. The gen sets would be used if or when interruptions occur in the power supplied by NVEnergy. This emergency backup power system is necessary because of the need for lighting and ventilation underground, as well as continuous dewatering pumping. The gen sets are portable and would be mounted in a self-contained unit with a spill pan built into and around the generators.

#### 2.1.4.3 Water Supply and Disposal System

AGC has a permit to extract 21.7 gallons per minute (gpm) or 35.0 acre-feet (ac-ft) annually from the Cove Pit Lake (Permit No. 76107, issued October 19, 2008 and expires December 31, 2012). Applications have been submitted by AGC to extend this right beyond the current expiration date. AGC has obtained additional water rights permits for water to be used for the

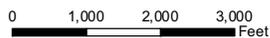


- Explanation**
- Project Boundary
  - Proposed Facilities
  - Proposed Transmission Line / Service Connections
  - Fencing
  - Existing Access Road
  - Monitoring Wells
  - Portal
  - Rapid Infiltration Basins
  - Sedimentation Basins
  - Temporary Ore Stockpile/WRDF
  - Stockpiles
  - Ponds

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 Mount Lewis Field Office LLNVB0100  
 50 Bastian Road  
 Battle Mountain, Nevada 89820



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**BUREAU OF LAND MANAGEMENT**

**COVE-HELEN UNDERGROUND MINE PROJECT**

**Proposed Surface Support Facilities**

**Figure 2.1.2**

01/16/2013

Project. Permit No. 80341, issued June 8, 2011, allows AGC to extract up to 144.79 ac-ft annually. This permit expires on December 31, 2017. Permit No. 80342, also issued June 8, 2011, allows AGC to extract up to 3,837 ac-ft annually. This permit also expires on December 31, 2017.

The water pumped from the Cove Pit Lake would be used to supply water for non-potable use at the temporary shop, wash bay, office complex, and in the fire suppression system. The water would be pumped using submersible pumps on the south side of the Cove Pit Lake to an existing 12,000-gallon storage tank at an approximate elevation of 5,200 feet amsl via approximately 1,700 feet of two-inch polyethylene (PE) pipe. The water from the storage tank would be supplied to the various buildings via two-inch PE pipe (11,140 feet in length). The pipe leading to the tank and from the tank to the facilities would be on the surface. The submersible pumps and pipe to the water tank are already in place, as they were used as part of the surface drilling operation. The pumps would be accessed for servicing via the ramp on the south side of the pit.

Bottled water would be the source of potable water for the Project. A water pump system housed in the pump house would pump water from the decline to the treatment/infiltration system for disposal. A second pump would be used to pump water from the 12,000-gallon storage tank to provide non-potable water to the temporary shop, wash bay, and office complex. This would also supply the fire suppression system.

The wash bay, dry room, and offices would have waste water lines that drain to one 6,500-gallon and one 9,000-gallon grey/black water tank located near the office buildings. The water tank associated with the wash bay would have a sand/oil separator attached. The waste water and sewage would be removed by a contractor and disposed of in an approved facility. No septic system would be installed for this Project.

#### 2.1.4.4 Hazardous or Regulated Material Storage

Diesel fuel for underground equipment, water trucks, and other diesel equipment would be stored near the ready line/equipment laydown yard. The temporary diesel tank would be a 10,000-gallon tank within a 30,000-gallon capacity containment area. The containment area would be a double-lined facility (geosynthetic liner). The containment area would also include an area for oil, lubricants, and other hazardous materials. Equipment would be fueled at a fueling station located adjacent to the fuel storage area within the containment area of the readyline and equipment area; therefore, any spills would be in containment. The liner would be protected by two feet of gravel. Pipe inserted into a concrete base would be installed between the fuel storage/fuel pumps and the equipment fueling area to protect the tanks from vehicle damage. A Conex container (a rectangular metal box that is generally used for the transportation of goods) would be used to house the oil, lubricants, and other hazardous materials. This container would be placed in the containment area.

AGC is exploring the possibility of using biodiesel in the mine equipment to reduce emissions. If biodiesel is used, then the fuel area would require two tanks; one for regular diesel and one for biodiesel. The concept of containment on a lined basin would still be utilized; however, there would be two tanks with a combined capacity of 10,000 gallons.

Blasting would be conducted as part of the decline/ramp development. Explosive agents would be purchased, transported, stored, and used in accordance with the U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) regulations, provisions of the Department of Homeland Security Act, and MSHA regulations. Packaged explosives, such as ammonium nitrate-fuel oil or packaged slurry, would be purchased and stored in an approved ATF magazine located away from facilities as directed by guidance in the ATF's standard distance tables (27 CFR, Part 555, Subpart K) for explosives storage, all within a secured area (an area accessible only by a licensed blaster). Blasting caps and accessories would be stored in a separate magazine within the same secured area. For storage of approximately two tons of explosives, the magazine should be approximately 600 yards away from the office. The explosive storage area would be surrounded on three sides by containment berms. Explosives would be brought into the underground development heading as required and consumed on a daily basis. There is no provision for an underground explosives magazine.

#### 2.1.4.5 Growth Media Stockpiles and Excavated Soil and Rock Stockpiles

Suitable growth media would be salvaged and stockpiled during the development of surface facilities. These stockpiles would be located near the site of excavation to facilitate replacement during reclamation. The north highwall of the Cove Pit Lake has between 20 and 30 feet of alluvial material that could meet the reclamation need. This material would be removed as needed at the time of reclamation. During construction of the RIBs and sedimentation pond, the soil would be removed and stockpiled. Additional material may not be suitable as growth media and may be considered overburden; however, the overburden material would also be excavated to achieve the required capacities of these facilities. This material is referred to as excavated soil and rock material and would also be stockpiled for use in backfilling these facilities at the time of reclamation. Based on previous Newmont operations in this area, this material is not anticipated to be acid generating. The growth media stockpile for the RIBs would have potential volume of 100,000 cubic yards (yd<sup>3</sup>). The excavated soil and rock stockpiles for the RIBs would have a volume of 1,170,000 yd<sup>3</sup>. The excavated soil and rock stockpile and growth media stockpile would have a combined area of 27.85 acres. The additional RIB excavated soil and rock stockpile would have a potential volume of 7,100,000 yd<sup>3</sup> and a footprint of 72.50 acres.

Similarly, prior to the construction of the WRDF, TOS, and evaporation pond, any suitable growth media would be salvaged and excavated soil and rock material would be stockpiled. The growth media stockpile would be located between the TOS and the Cove Pit Lake, and the excavated soil and rock stockpile would be located between the TOS/WRDF and the security building. The growth media stockpile would have a potential volume of 230,000 yd<sup>3</sup> and a footprint of 10.42 acres. The excavated soil and rock stockpile would have a potential volume of 800,000 yd<sup>3</sup> and a disturbance footprint of 27.98 acres.

Diversion channels or berms would be constructed around the stockpiles as needed to prevent erosion from overland runoff. Sediment basins would be used to contain sediment.

#### 2.1.4.6 Monitoring Wells

Four monitoring wells are proposed to be installed to monitor ground water conditions in the Project Area. One monitoring well would be installed upgradient of the RIBs, two would be

installed downgradient of the RIBs, and one would be installed downgradient of the TOS and WRDF complex. In addition, existing Newmont ground water monitoring wells would also be used for data collection. Figure 2.1.2 shows the proposed locations for the four monitoring wells within the mineralized zone, as approved by NDEP/BMRR for the Water Pollution Control Permit (WPCP). Additional wells may be needed when RIBs D and E are constructed. Permitting requirements would be fulfilled if additional wells are constructed.

The ground water monitoring wells would require authorization under BLM's surface occupancy regulations at 43 CFR 3715. In compliance with the Nevada Division of Water Resources (NDWR) requirements, each well would be equipped with a steel surface casing and a locking cap. The elevation of the top of the casing would be surveyed. Additionally, each borehole would be surveyed with a downhole directional survey prior to installation of the polyvinyl chloride (PVC) casing.

The ground water monitoring wells would be drilled and completed by a Nevada-licensed water well driller using a truck-mounted reverse circulation drill rig and support equipment. All of the holes would be vertical to support the monitoring wells. Each of the ground water monitoring wells would require a monitor well waiver from NDWR. AGC would provide the BLM and NDEP with copies of the NDWR waivers when they become available, which would contain the well construction details. It is anticipated that the monitoring wells would be actively monitored for the life of the Project and following closure if deemed necessary.

#### 2.1.4.7 Road Construction, Improvement, and Maintenance

The Project would be accessed via the existing McCoy/Cove Mine access road (paved road). The maintenance of this road would be the responsibility of AGC during the life of the Project. The access to the Project entrance from the main access road (compacted surface dirt road) would be upgraded to accommodate employee traffic and highway haulage trucks. The access road would be 25 feet wide with a two-foot roadside "V" ditch on each side of the road for drainage. The road would be crested with a two percent grade to promote drainage to the "V" ditches. The ditches would report to the sedimentation basins for erosion and/or sediment containment.

Haul roads are not a major component of the Project, but within the Project Area, haul roads would be at least three times the width of the largest haulage unit, or approximately 30 feet wide, and would include berms to meet MSHA specifications. Construction would be similar to the access road.

#### 2.1.4.8 Waste Rock Disposal Facility

Only one WRDF would be needed for the Project and would be constructed over the life of the Project. Approximately 99,000 tons of waste rock would be excavated during the development of the decline, ramp, and drilling platforms (Underground Stages 1 and 2). As designed, the WRDF would have a capacity of approximately 125,000 to 200,000 tons, but the additional capacity would allow for additional muck bays for temporary underground storage for waste rock and ore, and Underground Stage 3. The majority of the waste rock would be removed during the development of the decline.

#### 2.1.4.8.1 WRDF Design

The WRDF would be constructed by end dumping the waste rock onto the active bench face with the angle of the repose slopes. However, the WRDF would be built with average bench heights of 25 feet to provide a total capacity of 200,000 tons. The capacity of the first lift would be approximately 125,000 tons and the capacity of the second lift would be approximately 75,000 tons for a total capacity of 200,000 tons. It is not anticipated that the second lift would be needed during the first two stages of the exploration Project but may be needed for Underground Stage 3.

The placement of the material would be at an elevation of 15 feet below grade. The basin style of design allows any potential acid generating material to be fully contained within the confinement of the lined facility. The WRDF would be constructed as a lined facility with drainage to a double-lined evaporation pond. The minimum of a 60-mil smooth high density polyethylene (HDPE) liner would be overlain on a prepared subgrade. The subgrade or sub-base would be a compacted nine-inch layer of low permeability (i.e.,  $1 \times 10^{-5}$  centimeters per second [cm/sec]) soil liner. This would meet NDEP standards of no more than 12 inches of  $1 \times 10^{-7}$  cm/sec material (NAC 445A.438). The HDPE liner would be overlain with a 24-inch layer of drainage aggregate. A four-inch diameter collector pipe would be placed above the liner in the aggregate layer. All meteoric water that contacts the waste rock either would be evaporated from the facility or would be contained by the liner system. The collection pipe(s) would report to the double-lined evaporation pond. The basin style of construction allows for stockpile operating slopes of up to 1 Horizontal: 1 Vertical (H:V).

Berms would be constructed and maintained downgradient of the WRDF to prevent migration of any runoff onto adjacent land during active operations. These berms would consist of salvaged growth media, where practicable.

#### 2.1.4.8.2 WRDF Stability

Slope stability analyses on the WRDF were performed using industry accepted practices and experience from similar projects (Appendix E of the Plan). The software program Slide Version 5.0 (Rockscience 2009) was used to perform limit equilibrium analyses to evaluate static and pseudostatic slope stability on both transverse and longitudinal sections through the facilities. The influence of seismic loading was modeled using a peak (horizontal) ground acceleration of 0.14 gravity units (g) as reported by the USGS for the site. The desired minimum static factor of safety (FS) for a waste rock stockpile is typically 1.4.

Stability analyses assuming WRDF inter-bench slopes at 2H:1V yielded a minimum FS against failure of 1.45. Therefore, the design satisfies the typically required static FS of 1.4. Pseudostatic analysis applying a peak horizontal seismic load of 0.14 g, equivalent to an earthquake even with a recurrence period of 500 years, yielded a minimum FS against failure of 1.74. This is an acceptable level of safety in view of the proposed short period of operations of the facility and the extremely low probability of the design earthquake occurring during that period (i.e., 0.01). During reclamation, the WRDF would be graded to reclaimed slopes of 3H:1V, offering a FS against slope failure in excess of 2.0 for both static and pseudo static conditions.

The results of the analyses indicate that the WRDF would be stable under static and seismic loading conditions for both operational and closure conditions since the computed factors of safety either exceed the minimum prescriptive factor of safety or the permanent deformation estimated from the pseudostatic analyses would not exceed magnitudes that would cause a significant failure. The results of the deformation analyses indicate that for the design earthquake event, the expected permanent deformation of the analyzed sections would be minimal. These conclusions assume that the conditions in the field do not vary significantly from those modeled. The liner and encapsulation would prevent any material with acid generating potential from leaching from the WRDF and reaching the ground water.

#### 2.1.4.8.3 Waste Rock Characterization

Analysis was conducted on eight representative core samples of waste rock/development rock to determine the potential for these samples to release contaminants (Kappes, Cassiday, and Associates [KCA] 2009). Analytical methods used to determine potential constituents of concern included acid base accounting (ABA), meteoric water mobility procedure (MWMP), and mineralogical analysis. The complete laboratory report (KCA 2009) is included in Appendix E of the Plan. The analysis indicated that the waste rock generated during the development of the decline would consist primarily of Smelser Pass Limestone and to a lesser extent, Panther Canyon Conglomerate. A minor amount of Home Station Dolomite and Limestone and Favret Limestone would also be included in the waste rock during the ramp development.

#### *Acid Base Accounting*

ABA is a static test to determine the acid producing or acid neutralizing (AN) potential of a material. It is a general analysis for the elements of acid generation and does not indicate the potential rate at which generation or neutralization may occur. “For static tests, acid-generating values are expressed as acidification potential (AP) and neutralizing value expressed as neutralizing potential (NP). The net neutralization potential (NNP) equals NP minus the AP. Hence, a negative NNP test result demonstrates that acid-producing potential exceeds acid-neutralizing potential. A simplifying assumption in the static test is that all acid-generating and acid-neutralizing minerals would be available. This assumption adds uncertainty to the test results. To deal with the uncertainties of the static test, the BLM requires a kinetic test if the NNP does not exceed 20+ and/or the NP values is not at least three times greater than the AP value” (*Nevada BLM Water Resource Data and Analysis Policy for Mining Activities*).

Four parameters form the basis for the ABA evaluation are expressed in units of metric tons of calcium carbonate (CaCO<sub>3</sub>) equivalent per 1,000 tons of material:

- NP;
- AP;
- NNP, where  $NNP = NP - AP$ ;
- Neutralization Potential Ratio (NPR), where  $NPR = NP/AP$  (unit less).

Seven of eight waste samples tested did not show indications of potential acid generation in the ABA testing (Table 2.1-4). One of the samples (sample 42775B) had an uncertain potential to generate acid. This sample was waste rock from the Panther Canyon Conglomerate. The NPR

value was not sufficiently decisive to conclusively determine a trend. The sulfur content and NP for this sample were low and the paste pH did not indicate acid.

**Table 2.1-4: Summary of ABA Testing for Waste Rock Samples**

Sample #	Paste pH	Sulfide Sulfur %	NP/AP (total sulfur)	NP/AP (Sulfide Sulfur)	NNP* (Total Sulfur)	NNP* (Sulfide Sulfur)	Acid Generating Potential
<i>Smelser Pass Limestone</i>							
42775A	7.6	0.00	384	1440	207	207	NO
42775H	8.1	0.02	436	830	516	517	NO
<i>Panther Canyon Conglomerate</i>							
42775B	8.3	0.01	3.1	10	2	3	<b>Uncertain</b>
42775C	7.8	0.01	65	553	201	203	NO
42775I	6.9	1.50	8.2	10	419	431	NO
42775J	7.4	0.88	4.0	4.9	101	107	NO
<i>Favret Limestone</i>							
42775F	8.0	0.44	16	28	357	368	NO
42775L	7.8	0.57	16	25	414	423	NO

\*MT CaCO<sub>3</sub> equivalent/1,000 MT of material

#### *Meteoric Water Mobility Procedure Testing*

The purpose of the MWMP testing is to determine the potentially water-soluble elements of the sample material. By comparing the MWMP test results of the test materials with the Nevada reference standards, one can determine if there is a potential to mobilize harmful constituents. The MWMP results from the Smelser Pass Limestone indicated no potential to release contaminants. The results from the Panther Canyon Conglomerate indicated a low potential to release arsenic, magnesium, manganese, nickel, and sulfate, with pH and Total Dissolved Solids (TDS) above the reference standards in one or more samples. The results from the Favret Limestone indicated a low potential to release arsenic, selenium, sulfate, and thallium, with TDS above the reference standards in one or more samples.

#### *Kinetic Testing*

On April 27, 2010, a humidity cell test was initiated on one waste rock sample from the Panther Canyon Conglomerate that showed an uncertain acid generating potential during the ABA testing as described above (original sample No. 42775B, new sample No. 44301 NW-1). The humidity cell testing confirmed that the NW-1 waste rock material would not become acid generating. The WRDF has been conservatively designed to contain acid generating materials and is lined with HDPE. As a result, any waste rock would be contained in a zero discharge facility.

#### *Mineralogy*

Each sample was analyzed for mineralogy to determine gross mineralogy and identify any potential problematic constituents. The analyses did not identify any problematic minerals. A

summary of the mineralogy analyses is presented in Table 2.1-5. While all the samples had some pyrite (which generally indicates the presence of sulfides and potential for acid generation), the ABA found that the NNP was sufficient to have no acid generating potential in all but one sample of the Panther Canyon Conglomerate (Table 2.1-4). This rock type was subjected to kinetic testing, as per the BLM guidelines. Kinetic testing has been completed and a report has been provided in support of the NEPA analysis (Appendix F of the Plan).

**Table 2.1-5: Summary of Waste Rock Mineralogical Analysis**

Sample #	Mineralogy
<i>Smelser Pass Limestone</i>	
42775A	Magnetite, quartz, kaolin, and carbonate with traces of pyrite, plagioclase, hornblende, garnet, and biotite
42775H	Kaolin and carbonate, with traces of pyrite, hematite, quartz, and chert
<i>Panther Canyon Conglomerate</i>	
42775B	Pyrite, goethite, quartz, and chert
42775C	Pyrite, quartz, hematite, goethite, chert, and carbonate with traces of anatase and rutile
42775I	Pyrite, quartz, chert, and carbonate with traces of rutile and anatase
42775J	Pyrite, quartz, chert, kaolin, and carbonate with traces of rutile and anatase
<i>Favret Limestone</i>	
42775F	Pyrite, quartz, carbon, and carbonate with traces of anatase and rutile
42775L	Pyrite, quartz, carbon, and carbonate with traces of anatase and rutile

#### 2.1.4.8.4 Waste Rock Management

Although the bulk of the waste rock material is not anticipated to be acid generating, and there is sufficient AN potential to offset anticipated acid generation, AGC would line the WRDF as a contingency.

The quarterly waste rock monitoring would be used to identify materials that have NP and AP. The waste from these formations would be segregated on the WRDF with NP material placed on the edges of each lift and the AP placed in the interior of the lift. The final lift would consist of only NP material. In this manner, the final grading would result in the AP material being encapsulated in the NP material.

In addition, the sequence of decline development would require that the Smelser Pass Limestone be removed first and placed in the lower lifts of the WRDF. The samples from this material were determined to have high NP/AP ratios and high NNP. Any Panther Canyon Conglomerate material with low NP/AP ratio or low NNP would be placed on the WRDF and encapsulated by covering with additional Panther Canyon Conglomerate material that has a high NP/AP ratio and high NNP.

The liner and encapsulation would prevent any AP material from leaching from the WRDF and reaching the ground water.

#### 2.1.4.9 Lined Temporary Lined Ore Stockpile and Load-Out Area

##### 2.1.4.9.1 TOS Design

The TOS would be located near the WRDF and would be accessed by the same haul route used for the waste rock. During the end of the development of the decline and the beginning of the development of the ramp, zones of ore would be encountered. The ore would be removed as part of the decline/ramp/drilling platform development, as well as during exploration crosscuts. The ore would be shipped off site for metallurgical testing and would only be stockpiled on site for a short time. The initial estimate of ore to be temporarily stockpiled is up to 30,000 tons and the TOS as designed would have a capacity of 30,000 tons. However, depending on the schedule at the toll mill location, the ore would either be shipped on a regular basis or would be temporarily stored; either way it is not anticipated that the TOS would reach full capacity. The TOS would be constructed similarly to the WRDF; by end dumping the ore rock onto the active bench face with the angle of the repose slopes. The TOS would be built with an overall slope of 3H:1V by using average bench heights of 15 feet and bench setbacks of 45 to 50 feet.

The TOS would be constructed as a lined facility with drainage to a double-lined evaporation pond to protect ground water resources. The 60-mil smooth HDPE liner would be overlain on a prepared subgrade. The subgrade or sub-base would be a compacted eight-inch layer of low permeability soil liner. The HDPE liner would be overlain with a 24-inch layer of drainage aggregate. A four-inch diameter collector pipe would be placed above the liner in the aggregate layer. All meteoric water that contacts the ore would either be evaporated from the facility or would be contained by the liner system. The collection pipes would drain into the double-lined evaporation pond.

The TOS bermed area would have depth markers to alert the loader operator when the protective layer of drainage aggregate has been exposed. This would include a colored layer of visqueen placed six inches below the surface of the aggregate protection liner. It is also likely that the ore would vary in color from the aggregate liner, providing another means of ensuring the aggregate liner remains in place while removing just the ore. Berms would be constructed and maintained downgradient of the TOS to prevent migration of any runoff onto adjacent land during active operations. These berms would consist of salvaged growth media, where practicable.

The west side of the TOS would be ramped to allow highway trucks to enter the TOS to be loaded and to leave the site. AGC anticipates using 35-ton trucks to haul the ore off site. The trucks would enter the TOS area on the load-out ramp. This ramp would have at least two feet of aggregate over the liner to protect the liner. The loader would access the ore from the lined pad or from the stockpile. The trucks would remain on the lined pad. The TOS would be built with warning tape and grade markers to alert the loader operator where the ore meets the aggregate, which would allow the operator to maintain the integrity of the liner protection system.

##### 2.1.4.9.2 Ore Characterization

Analysis was conducted on representative core samples of three high-grade and three low-grade ore types to determine the potential for these samples to release contaminants (KCA 2009). Analytical methods used to determine potential constituents of concern included ABA, MWMP,

and mineralogical analysis. The complete laboratory report (KCA 2009) is included in Appendix E of the Plan. The ore rock generated during the development of the decline/ramp/drilling platforms and exploration crosscuts would come from mineralized zones that are highly fractured.

*Acid Base Accounting*

Five of the six ore samples did not show indications of potential acid generation in the ABA testing (Table 2.1-6). One of the samples (sample 42775G) had potential to generate acid. The NPR value was less than one and the NNP was negative. The sulfur content was low; however, the neutralizing potential was also very low. The paste pH was neutral.

**Table 2.1-6: Summary of ABA Testing for Ore Rock Samples**

Sample #	Paste pH	Sulfide Sulfur %	NP/AP (total sulfur)	NP/AP (Sulfide Sulfur)	NNP* (Total Sulfur)	NNP* (Sulfide Sulfur)	Acid Generating Potential
42775E	7.5	0.79	6.5	9.3	194	204	NO
42775G	7.1	1.35	0.5	0.5	-25	-22	YES
42775M	7.5	0.91	6.7	8.7	211	219	NO
42775D	8.4	1.01	13	17	484	491	NO
42775K	8.3	0.56	21	30	489	496	NO
42775N	7.6	0.60	19	28	499	509	NO

\*MT CaCO<sub>3</sub> equivalent/1,000 MT of material

*Meteoric Water Mobility Procedure Testing*

The MWMP results from the high-grade ore material indicated limited potential to release antimony, arsenic, magnesium, manganese, sulfate, and thallium. TDS levels in several samples also exceeded the Nevada standards. The results from the low-grade ore material indicated a limited potential to mobilize antimony, arsenic, magnesium, manganese, nickel, sulfate, and thallium. TDS levels in several samples also exceeded the Nevada standards. The pH of all samples was less than 8.5 standard units.

*Kinetic Testing*

On April 27, 2010, a humidity cell test was initiated on one potentially acid generating sample of ore (original sample No. 42775G, new sample No. 44302, NW-5). This sample was selected from the original ABA core samples described above. Although the ABA testing confirmed that the NW-5 ore material would likely become acid generating, after 20 weeks this had not occurred. The humidity cell testing was stopped at 20 weeks and the ore sample NW-5 was assumed that it would become acid generating. Therefore, the TOS facility has been conservatively designed to contain acid generating materials and is lined with HDPE. As a result, any ore material would be contained in a zero discharge facility. In addition, the ore material would not be stored for more than four to 12 weeks before it would be shipped to an off-site processing facility.

*Mineralogy*

Each sample was analyzed for mineralogy to determine gross mineralogy and identify any potential problematic constituents. A summary of the mineralogy analyses is presented in Table 2.1-7. As indicated in Table 2.1-6, the majority of the ore is not anticipated to be acid generating, in spite of the presence of pyrite in the ore. Since some of the ore might be acid generating and there is potential for mobilization of some minerals, AGC has elected to line the TOS as a contingency to protect the waters of the state. The ore would be removed periodically, and therefore, the opportunity for constituents to be released or acid to be generated would be minimal. The liner would contain and convey any minerals and effluent from the TOS to the evaporation pond. The sludge from this pond would be cleaned out periodically and disposed of in an approved facility. Any sludge remaining at Project completion would be removed and disposed of as identified in Section 2.14.12.

**Table 2.1-7: Summary of Mineralogical Analyses of High-Grade and Low-Grade Ore**

<b>Sample #</b>	<b>Mineralogy</b>
42775E	Pyrite, carbon, quartz, and carbonate
42775G	Pyrite, mica, quartz, and feldspar
42775M	Pyrite, quartz, carbon, and carbonate with traces of rutile, hematite, and anatase
42775D	Pyrite, chert, and carbonate with traces of anatase
42775K	Pyrite, quartz, carbon, and carbonate with traces of rutile and anatase
42775N	Pyrite, quartz, carbon, and carbonate with traces of rutile and anatase

2.1.4.9.3 Ore Management and Transport

AGC proposes to transport the bulk sample via highway trucks to either the Jarrett Canyon or the Newmont Carlin Mill 6 facilities for metallurgical analysis and processing. One-way distances between the Project Area and the mills are approximately 149 miles and 86 miles, respectively. The ore would be stockpiled in the TOS. When sufficient quantity is available, the material would be transported using 35-ton highway trucks. The definition of sufficient quantity would depend on the terms of the contract with the trucking company. However, the intent is to move the material off site as soon as possible. Assuming the estimate of 30,000 tons is correct, 857 truck loads would be required to transport the ore. At five trucks per day, this would require approximately 171 days to transport the ore. There may be times when the TOS would not have any stockpiled ore and times when the ore would be stockpiled for several months because the bulk sampling would occur at irregular intervals. The length of time when the TOS would be empty or when ore would be stockpiled cannot be predicted with any certainty. The interval between periods of shipment would depend on the amount of bulk sampling that occurs in any given month. The ore would be covered during transportation to reduce any dust or particle emissions.

2.1.4.10 Stormwater Management

Based on the results of the hydrologic evaluation and hydraulic design (Telesto 2012 and HydroGeo 2012), AGC proposes to construct temporary diversion channels to divert run-on water and control runoff from the Project Area. Stormwater diversion channels would be constructed to divert water away from the TOS and WRDF to the RIB system. Temporary

diversion channels would be located along the north and east sides of the TOS, around the northeast perimeters of the portal decline, along the east side of the mining contractor's shop areas and additional RIB stockpile, and along certain reaches of the ore and waste haulage roads. These diversions would be designed and constructed to prevent run-on into areas of active operation. The temporary diversion channels have been designed to safely convey peak flows associated with the 100-year/24-hour storm event. The channels would direct runoff to pre-existing natural drainage channels on the north side, downgradient from the temporary pump house site. The temporary diversion channels have been designed as riprap-lined channels with maximum depths of three feet as required by flow velocities and volumes. In addition, a 30-inch deep, four-foot wide bottom trapezoidal channel with 3H:1V side slopes would be constructed along the east side of the north access road.

An existing permanent diversion channel is located along the western portion of a reclaimed stockpile and splits two basins. The permanent diversion channel has a length of approximately 2,000 feet and been designed as trapezoidal in shape (bottom width of 15 feet and total depth of five feet). The lower 3.2 feet of the channel is armored with riprap having a nominal size of 24 inches to protect against high velocity stormwater event flows. The channel would remain in its current condition during and after the Project. The diversion channel design for the Project would connect the proposed diversion channel from the Cove Pit Lake to the existing diversion channel and convey storm flows through the sediment basins and eventually to the RIBs.

The stormwater that flows down the ramp or runs off the portal area would be directed to a small sediment containment basin beyond (i.e., west) and downgradient of the portal. Stormwater would be allowed to evaporate from the small sediment containment basin and the sediment would be periodically removed and disposed of in an off-site approved facility (i.e., hydrocarbon facility).

Drainage structures with a design life of two years or more are regarded as permanent. Permanent drainage channels would be lined with riprap or vegetation per the civil improvement plans. All channels associated with the Project are considered permanent. All channels would be reclaimed at the end of the Project.

#### 2.1.4.11 Development Water Management and Treatment

##### 2.1.4.11.1 Inflow Management

Open pit and underground mining at the Cove Pit Lake conducted by Echo Bay required dewatering. Analysis of the Cove-Helen Project by Newmont's hydrology data indicates that long-term inflow to the decline could be approximately 1,200 gpm and that the short-term inflow rate from unexpected areas of high hydraulic conductivity could be approximately 2,400 gpm (HydroGeo 2010a). Therefore, AGC anticipates the need to actively remove ground water inflow from underground exploration workings. A hydrogeologic study assessing ground water inflow in the exploration workings was completed by HydroGeo in October 2010. The result of this preliminary study was based on the Project geometry and on site-specific data for hydraulic parameters obtained from previous investigations. The estimate total annual average inflow to the decline and workings is expected to be between 800 gpm and 1,200 gpm (HydroGeo 2011a). Short-term ground water inflow rates could be much higher because pockets of rock with high

fracturing and high hydraulic conductivity may be encountered locally. Currently, ground water in the Project Area is at an approximate elevation of 4,600 feet amsl and therefore, the portal and initial 674 feet of the decline would be above the water elevation and not subject to ground water inflows (HydroGeo 2011a). In order to anticipate the need for ground water inflow, AGC would install a pilot borehole drilled in advance of and parallel to the decline or a single short “feeler hole” in the face of decline as it advances. “Feeler holes” would likely be drilled at select sections based on geology and other indications for the potential to encounter high ground water inflow (HydroGeo 2011b).

In the case that potential high ground water inflows are connected to a surface water source or compromise ground support, a cover grouting program would be applied to control ground water flows. Large volume, continuous flow, without substantial reduction within a few days would indicate this. Grouting is a very effective way to control excess ground water inflow and can reduce inflow by 80 percent. However, ground water inflows are not expected to be great enough to warrant grouting (HydroGeo 2011b).

Normal inflow water encountered during development of the decline would be diverted to a series of sumps and pumped in stages to the surface. The pumping would use stages of relatively low head and centrifugal pumps that are able to handle some level of suspended solids. There would also be one or more small settling sumps underground. Discharge water from the decline would be pumped to the pump house, then channeled to the water treatment system, and then to the RIB system. AGC would provide the BLM with as-built drawings of the water evacuation system as the decline is developed. Pumping water from the decline is addressed in the Water Pollution Control Permit (WPCP) for the Project.

Water encountered in the development of the decline would be used to the maximum extent possible to meet the consumptive water needs of the Cove-Helen operations for underground decline development (taken from the underground sumps). This water would drain to the sumps after use and be pumped to the surface for treatment and discharge to the RIBs. AGC would apply for a temporary water right to use some of the ground water encountered during development of the decline and exploration activities to meet the Project’s consumptive use requirements. The total estimated consumptive usage for the Project for the first year of operation is 235.93 ac-ft. For subsequent years, the estimated usages are as follows: for Year two 118.4 ac-ft/yr; for Year three 108.4 ac-ft/yr; for Year four 98.4 ac-ft/yr; and Year five 31.2 ac-ft/yr.

No dewatering wells would be installed. The water would be pumped from the underground facilities as encountered. The estimated underground water production is as follows: for Year one, between 890.6 and 1,278.8 ac-ft/yr; for Year two, between 1,329.2 and 1,908.7 ac-ft/yr; for Year three, between 996.9 and 1,431.5 ac-ft/yr; for Year four, between 664.6 and 954.3 ac-ft/yr. It is not anticipated that ground water production would occur during reclamation and closure activities in Year five. In the unlikely event that the capacity of the RIBs is approached, the need to install dewatering wells would be reevaluated and a modification to the Plan would be submitted.

#### 2.1.4.11.2 Development Water Treatment

Water developed from the decline water disposal system and pump house drainage would be managed with a multi-stage treatment train to remove pollutants and sediments prior to infiltration. The decline water disposal pump system would convey water to a booster pump station in the pump house, where it would be discharged to sedimentation ponds and then a surge pond. This water would then be processed through a water treatment plant to remove nitrates and other constituents. The mechanical water treatment system, such as reverse osmosis or nanofiltration would be designed by a qualified engineer with the purpose of treating the water to meet the NDEP Profile I water quality standards for the constituents outlined in the WPCP for the Project prior to discharge into the RIB system.

The treated water would be infiltrated into the main RIB system, which would measure approximately 19.05 acres and be located at the low point (north point) of the site. This RIB would be designed to accommodate up to a maximum discharge rate of 2,500 gpm. This RIB would be constructed as two cells (RIB 1A and RIB 1B) that would allow one cell to operate and one cell to be closed down for maintenance, as needed. When water disposal rates reach the rate of 1,250 gpm in each cell, an additional eight-acre RIB would be constructed to allow for maintenance of RIBs 1A and 1B. This process would be repeated as necessary by increasing the number of additional RIBs; however, the total discharge to the RIBs would not be greater than a maximum of 2,500 gpm. This approach would provide an infiltration capacity buffer of between 600 gpm and 1,500 gpm. Anytime an additional RIB is constructed, a monitoring well would be installed downgradient of the RIB and as directed by the NDEP. All permitting, bonding, and NEPA requirements would be met prior to the construction of any additional RIBs and wells. The treated water and the discharge rates and water quality standards would be managed under the WPCP for the Project. If the discharge rate needs to be increased to an amount greater than the maximum 2,500 gpm, then AGC would seek additional approvals to increase the discharge rate prior to an actual increase.

The RIBs would be located in the same area as the McCoy/Cove RIBs in order to take advantage of the existing geotechnical data and known percolation rates. The percolation rates were used to estimate that the percolation area required for each 1,000 gpm of flow is conservatively estimated to be 377,600 square feet (ft<sup>2</sup>), or 8.67 acres (BLM 1989). The Project has a total percolation area of 4,970,882 ft<sup>2</sup>; therefore, the system has the capacity to accommodate flows of up to approximately 13,000 gpm. This value is 5.2 times the maximum average development water management rate, which provides a reasonable assurance that the development water can be infiltrated.

#### 2.1.4.12 Double-Lined Evaporation Pond

As part of the liner system for the WRDF and the TOS, a double-lined evaporation pond would be constructed to collect any meteoric water runoff that percolates through the two facilities. The double-lined evaporation pond would have the capacity to contain 59,250 gallons of runoff. The double-lined evaporation pond would measure approximately 51,120 ft<sup>2</sup> (1.10 acres) with a trapezoidal shape (3H:1V side slopes) and a depth of 25 feet. A slope stability analysis was prepared for the evaporation pond and is included in Appendix E. The ditches that drain to the pond would be lined as described for the TOS and WRDF. The evaporation pond would be

double-lined to provide redundancy and leak detection because the evaporation pond would hold the solution until removed by evaporation. The TOS and WRDF are designed to drain the solution to the evaporation pond without retention; and, therefore, there is not a need for a double liner for those facilities. The retention of the solution in the evaporation pond necessitates the redundancy and leak detection system. At the closure of operations, any remaining liquid waste within the evaporation pond would be tested, removed and disposed of at a U.S. Environmental Protection Agency (EPA)-certified or other certified facility. Dry or nearly dry sludge would be encapsulated in NP material and remain in the double-lined evaporation pond until final reclamation occurs.

The liner system for the evaporation pond would include a 60-mil HDPE liner overlain on a prepared subgrade. The subgrade or sub-base would be a compacted nine-inch layer of low permeability (i.e.,  $1 \times 10^{-5}$  cm/sec) soil liner. The liner would be overlain with an 80-mil dimpled HDPE liner.

This same liner system would be used to create a monitoring port. A sump would be constructed under the pond that would consist of the 60-mil HDPE liner and a 12-ounce geotextile fabric that would enclose two feet of  $\frac{3}{4}$ -inch gravel. The 80 mil dimpled HDPE liner would be placed over the sump. A six-inch perforated PVC pipe would extend the depth of the sump between the two liners and then a six-inch nonperforated pipe would extend to the surface between the two liners as a monitoring port.

Technical specifications for the liners are located in Appendix F of the Plan.

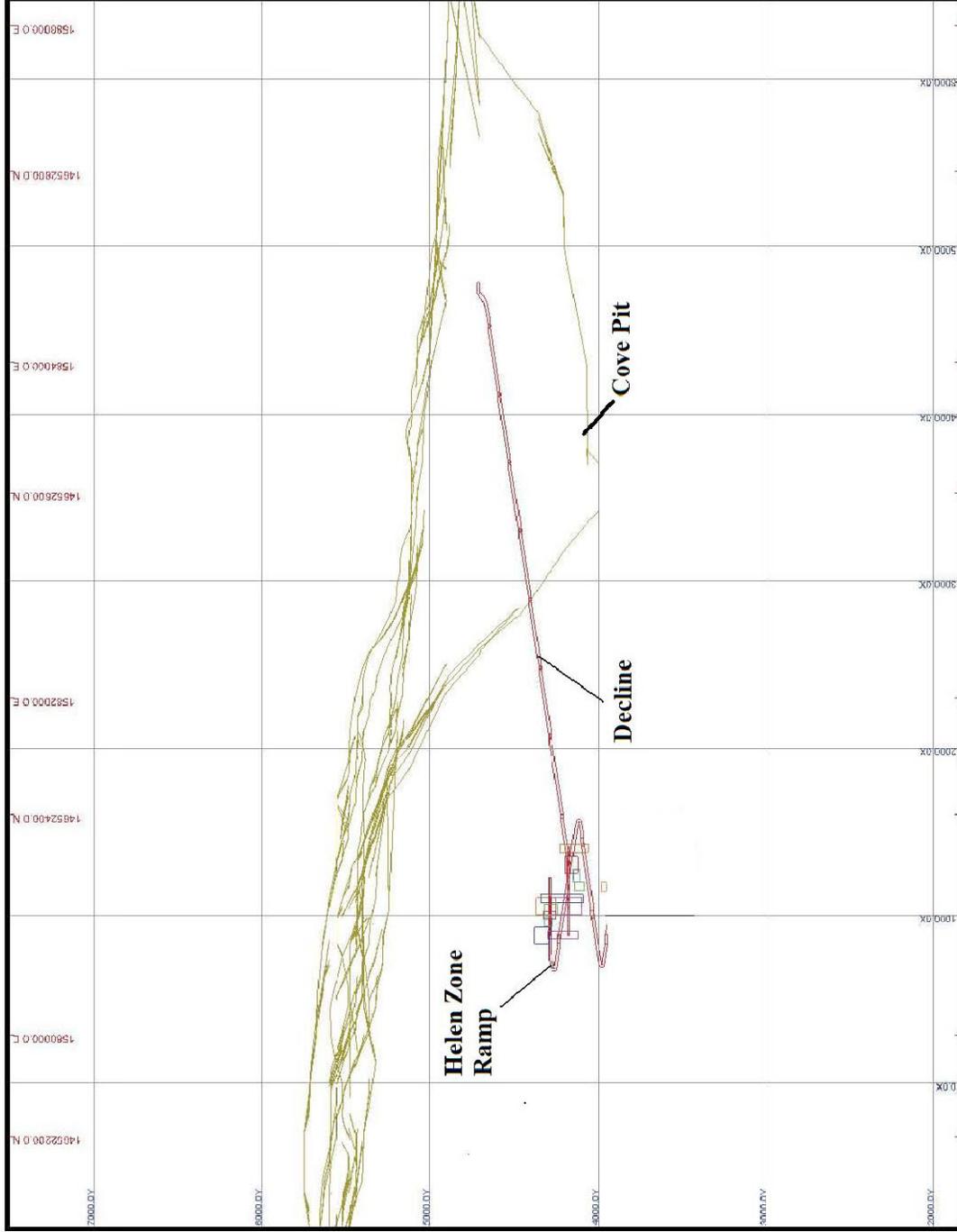
### **2.1.5 Proposed Underground Facilities**

The proposed entrance (portal) to the underground facilities is displayed on Figure 2.1.2, a cross-section of the decline is shown on Figure 2.1.3, and a plan view of the decline in relationship to the hydrographic basins and Project Area is shown in Figure 2.1.4.

#### **2.1.5.1 Portal, Decline, and Ramp**

The portal would be located on the northeast side of the Cove Pit Lake highwall at approximately 4,700 feet amsl. The squaring of a face for excavation of the portal and the initial development rounds may generate flyrock that would enter the pit lake. Flyrock would be controlled by blasting mats in the event that flyrock appears to have the potential of entering the pit. The existing ramp that accesses the portal location would need to be opened by removing the existing berm across the ramp and the ramp surface near the portal would need to have fallen rock removed to allow access to develop the portal. Loose gravel on the highwall above the portal area would be removed in preparation for development of the portal. The ventilation fan and compressor would be on self-contained units and located near the entrance to the portal. A 13-foot wide canopy cover would be placed over the portal. The portal entrance would be reinforced with concrete as necessary to create a stable opening.

The removed material would be used to create a small sediment containment basin that would be maintained on a periodic basis. The basin would be located downgradient of the portal opening. The small sediment containment basin would prevent any sediment from the ramp or portal construction from draining to the pit lake.



1,000 Feet



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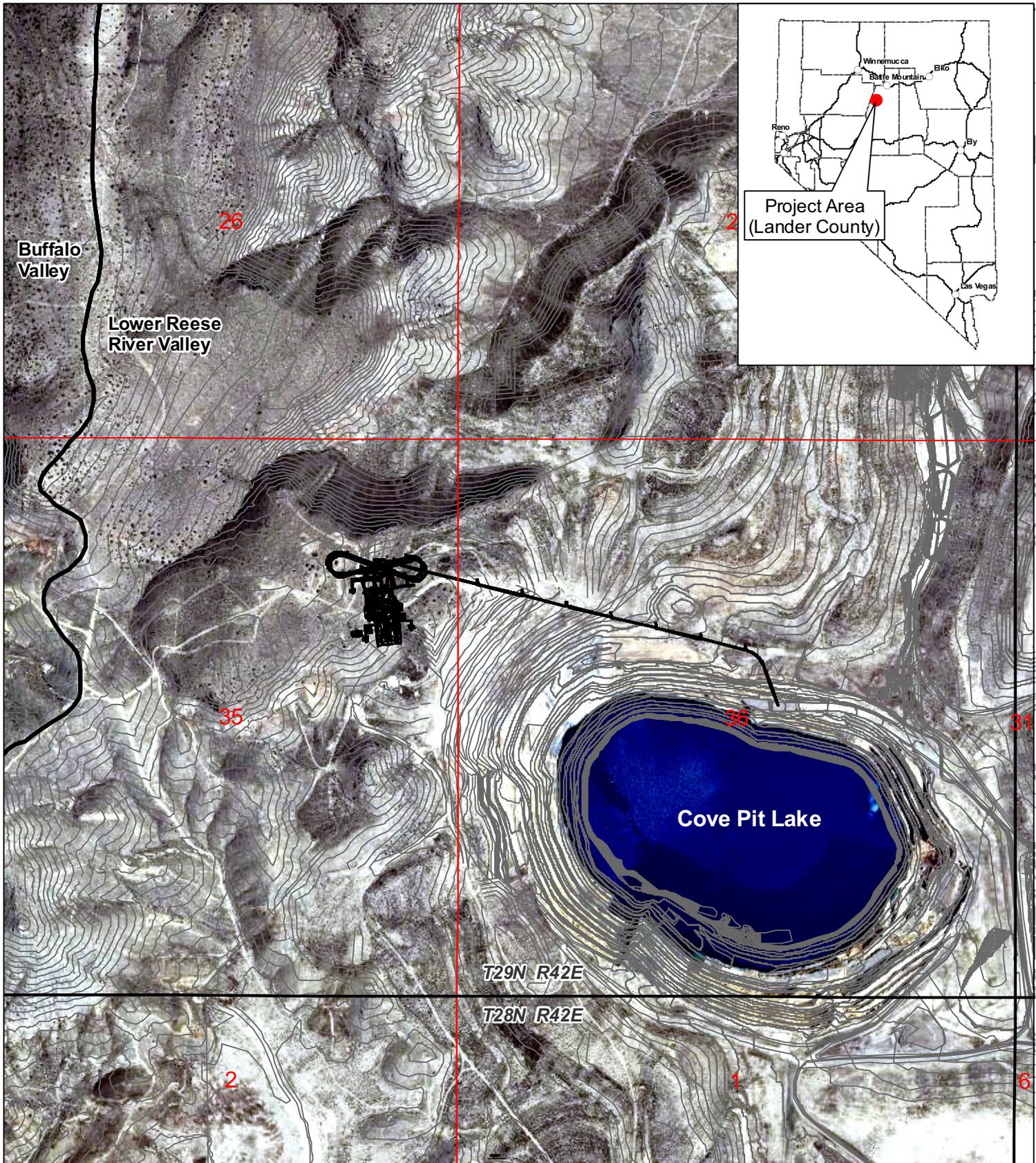
**BUREAU OF LAND MANAGEMENT**

**COVE-HELEN UNDERGROUND  
 MINE PROJECT**

**Cross Section of Cove-Helen  
 Decline and Ramp**

Figure 2.1.3

01/16/2013



**Explanation**

- Proposed Decline/Ramp
- ▭ Hydrographic Basins

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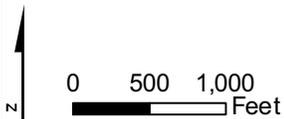
**BUREAU OF LAND MANAGEMENT**

**COVE-HELEN UNDERGROUND MINE PROJECT**

**Plan View of the Proposed Project Development**

Figure 2.1.4

01/16/2013



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The drift would be constructed approximately 100 feet past the pit wall area of influence before turning northwest to run in the footwall of one of the structures considered to be a control for the mineralization for a distance of approximately 3,700 feet. The final distance would depend on development rates and the need to conduct diamond drilling or to crosscut ore zones. The exploration drift statistics are shown in Table 2.1-8. Additional development would be required to crosscut the Helen Zone and to provide suitable drill stations (platforms) in the Helen Zone. Furthermore, the development footage would be greater than shown in Table 2.1-8 as there would be allowances for muck bays, sumps, and storage areas along the drift.

**Table 2.1-8: Details for Helen Zone Decline**

Item	Slope (percent)	Length (feet)	Final Elevation (amsl)
Initial Drift	0	100	4,700
Decline to South end of Helen Zone	-15	3,700	4,170
Decline to North end of Helen Zone	-15	900	4,040

A conventional drill and blast mechanized development would be used to advance the decline. The decline would be approximately 13 feet wide and 13.5 feet high. The back of the decline would be arched to allow an overhead ventilation duct to be placed in the center of the overhead area. In addition to the ventilation duct, the decline would require a six-inch compressed air line, two-inch fresh water line, dewatering pipeline(s), electrical cable, a blasting line, and a communications line.

Ground support would consist of rock bolts, mesh, and shotcrete. Rock bolts would be the primary ground support, but if the rock is highly fractured, mesh would be used in conjunction with the rock bolts. For very poor rock conditions, shotcrete would be used in small batches. It is not anticipated that a batch plant would be necessary for this Project. Subject to the approval by AGC, ground support details and selection of method or methods of ground support would be under the supervision and direction of the work supervisor.

Muck bays would be required for efficient waste rock handling, as well as for use as storage areas, electrical substations, and sumps as part of the pumping system. A 40-foot long muck bay spaced every 500 feet along the decline is recommended. The muck bays would be designed to permit haul trucks to turn around for the trip out after being loaded in the decline.

The Project would include underground emergency safety chambers. The safety chambers or refuge station would be supplied by the underground mining contractor, but in general, the chambers would have communication capabilities, oxygen supply, food and water, sanitary facilities, sealing doors, and external signals to alert rescue personnel to the presence of humans in the facility. The chambers would not be installed until the face of the decline has advanced a safe distance from the portal as determined in the field. The contractor would be responsible for the location and spacing of these chambers. In compliance with MSHA regulations, or 30 CFR 57.11050, a second escape way would be constructed as part of the Project. The design and placement of the second escape way would be driven by the underground geologic conditions and the avoidance of the known cultural resource site within the Project Area. The construction timing of the second escape way would occur in the second or third phase of the Project and

coordinated with MSHA based on current mine safety requirements. An underground evacuation plan would be prepared by the mine operator, per MSHA regulations 30 CFR 57.11053. The design and other details about the secondary escape way would be included in an underground evacuation plan. Following MSHA approval of the secondary escape way design, the details of the design would be provided to the BLM and NDEP prior to installation.

The decline would be advanced with an electrical hydraulic jumbo, which is a type of mobile horizontal drill. The jumbo would use 14-foot steel to break a 12-foot round. The estimated average rate of advance would be 18 feet per day. This rate is applied to the main decline and it is assumed that the efficiency of dual headings when driving muck bays would offset the extra footage associated with the muck bays. At 18 feet per day, the Project would take approximately eight months to reach the end of the decline from the collar. After the decline development, there would be a program consisting of 800 feet of crosscuts that would require approximately two months, followed by the diamond drilling. Upon reaching the Helen Zone, the decline would be developed into a ramp that extends down to the 4,000 foot level. The minus 15 percent ramp would be laid out in a figure eight configuration to provide the opportunity to develop crosscuts at different levels. Based on the analysis of the diamond core drilling, the ramp would be extended down to a level to be determined for additional crosscuts and diamond core drilling.

#### 2.1.5.2 Crosscuts and Drilling Platforms

Once the decline has reached the Helen Zone, a drilling platform would be created to allow approximately 40,000 feet of diamond core drilling to be conducted. The drilling platforms would be set up in a drift and would be the same dimensions as the decline. The drilling would be designed to determine the extent of the Helen Zone in three dimensions, which would require drilling vertically, horizontally, and various angles in between. A second program of diamond core drilling would occur near 4,040 feet amsl following development of the ramp. This would also involve 40,000 feet of drilling. A third phase would include approximately 80,000 feet of diamond drilling.

A crosscut is planned for the 4,170-foot level, with provision for both drilling and bulk sampling within the mineralized zones. The crosscuts would be driven at a slight upgrade to provide drainage to the decline, and the headings would be approximately 12 feet by 12 feet or as small as dictated by the excavation and drilling equipment. A second set of headings is planned for the 4,040-foot level. This lower level would be located as low as practicable. The crosscuts would be used to collect bulk samples as well as to excavate material for the drilling platform. These crosscuts would provide additional information related to the deposit and subsequently be used for drilling platforms as needed.

The ground conditions are expected to be generally poor in the crosscuts and very poor in the mineralized zones due to the fractured nature of the mineralization. Within the mineralized zones, shotcrete would be required as ground support. For the planned and expected level of shotcrete use, the shotcrete would be supplied in pre-mixed bags; therefore, no surface batch plant would be required.

### 2.1.5.3 Ventilation, Compressed Air, Water, Power, and Mine Services

Decline ventilation would be an issue due to the length of the decline, the size of the diesel equipment proposed, and MSHA regulations related to diesel particulate matter. The amount of fresh air that can be supplied to the face is expected to be the constraint on the amount of equipment which can be in used at any given time. A ventilation duct that is oval and has dimensions of three feet by five feet would provide a maximum air flow of 60,000 cubic feet per minute into the mine. Conversely, the proposed ventilation circuit has been planned to use the ventilation duct as an exhaust airway, with fans set up on the surface to draw the air out of the decline via the duct. This system would draw air into the decline and permit the loaded trucks to travel in fresh air. Near the face, a small auxiliary fan and flexible ducting would be maintained to provide positive air flow to clear the face. The use of a suction system would clear the blasting smoke more rapidly and permit ready access to the face after blasting. The same equipment could be used to provide a positive pressure system as well.

The compressed air system would be located on the surface, but would service the underground facilities. The compressed air is needed to run jackleg drills for roof bolting and the heading mud-pumps. The compressed air would be distributed by a six-inch air line installed in the decline.

Water for drilling and dust suppression would be provided through the surface water system and pumped via a two-inch line into the decline. The average use of water for drilling and dust suppression is estimated to be 30 to 50 gpm.

Electrical power would be provided by the extension of powerlines from the proposed substation and transformer to the exploration portal. An electrical cable would be installed in the decline and extended as the face is advanced. The electrical system would use a higher voltage main powerline with small substations to provide 480-V power at the load centers. A main load center would be kept reasonably close to the face to reduce the impact of line loss. Plugs or switch gear for diamond drill power would be installed as the decline is advanced for the ease of future exploration. A generator would be placed near the portal as an emergency backup power system to provide ventilation and lighting in the event of a power outage.

Mine services include communication and blasting. The underground communications would be a combination of a hard wired telephone and a radio system using a repeater and a leaky feeder system, which is a wire used as an antenna underground. The wiring would be removed as portions of the underground workings are abandoned. A good communications system is important due to the single heading and the planned distance to the face.

### **2.1.6 Workforce**

During surface exploration activities, it is anticipated that nine to 18 contract drilling employees would be employed, and three AGC employees would be providing oversight. The building contractor would have approximately six individuals during facility construction and would be hired locally. The development program and underground drilling program would be undertaken by contractors, with geological oversight provided by AGC technical personnel. AGC anticipates

having a maximum of three individuals onsite during underground activities and ten mining contractors.

The maximum number of individuals working on the Project at any one time is expected to be approximately 27 when surface exploration and facility construction are taking place. It is estimated that a total 37 individuals would be employed by AGC or contractors to work on the Project over the life of the Project. It is anticipated that the workforce would be already living in the area around Battle Mountain. The temporary workforce would likely stay in Battle Mountain.

### 2.1.7 Equipment

The development of the decline, bulk sampling, and drilling would be carried out using medium sized mechanized equipment. The specific equipment for development of the decline would be selected by the contractor based on availability and appropriateness for the job. Table 2.1-9 includes a list of appropriately sized equipment for the development of the decline, bulk sampling, and drilling. Most of this equipment would be removed from the Project Area upon completion of construction.

**Table 2.1-9: List of Proposed Project Equipment**

Type of Equipment	Number
<i>Underground - Main Development Equipment</i>	
Load-Haul-Dump units	2
Truck	2
Jumbo	1
<i>Underground - Auxiliary Equipment</i>	
Bolter	Optional
Scissor Lift	1
Utility Vehicle	1
Supervisor's Vehicle	1
Mechanic's Vehicle	1
<i>Surface Equipment</i>	
Van	3
D10R Track Dozer	1, occasional use
966G Wheel Loader	1
16H Motor Grader	1, occasional use
Pickup Trucks	3
Truck or track-mounted diamond core drill rig	Average 3, up to 6
Reverse circulation drill rig	1
Caterpillar 320D or equivalent	1
Caterpillar D6 or D8 bulldozer or equivalent	1
Caterpillar D250E water truck or equivalent	1

### **2.1.8 Surface Occupancy (43 CFR 3715)**

Under 43 CFR 3715 Part 3710 Subpart 3715.0-5, occupancy means full or part-time residence on the public lands. Occupancy also means activities that involve residence; the construction, presence, or maintenance of temporary or permanent structures that may be used for such purposes; or the use of a watchman or caretaker for monitoring activities. Residence or structures include, but are not limited to, barriers to access, fences, tents, motor homes, trailers, cabins, houses, buildings, and storage of equipment or supplies. Monitoring wells would have locked structures that extend above ground level. These activities are reasonably incident to exploration and meet the definition of occupancy.

### **2.1.9 Reclamation Plan**

Reclamation of disturbed areas resulting from activities outlined in the Plan would be completed in accordance with 43 CFR 3809, Nevada Revised Statute (NRS), Nevada Administrative Code (NAC) 519A, and 445A, respectively. Reclamation would meet the reclamation objectives as outlined in the United States Department of Interior Solid Minerals Reclamation Handbook #H-3042-1 (BLM 1992), Surface Management of Mining Operations Handbook H-3809-1 (BLM 1989), and revegetation success standards per BLM and NDEP “Revised Guidelines for Successful Mining and Exploration Revegetation” (BLM 1999). The BLM is responsible for preventing undue or unnecessary degradation of BLM-administered public lands that may result from operations authorized by the mining laws (43 CFR 3809).

The goal of the Reclamation Plan is to physically stabilize the disturbed areas and return them to the pre-exploration land use. Generally, this is accomplished by regrading disturbed areas to blend with the surrounding topography and revegetating disturbances to be compatible with post-exploration land uses. To ensure that this goal is accomplished, AGC would post a reclamation bond that meets the requirements of the BLM and NDEP.

Concurrent reclamation would occur primarily during the surface exploration activities when areas disturbed are no longer needed for drilling or drill site access. Opportunities for concurrent reclamation of the proposed surface facilities are limited due to the nature of the underground stages of the Project. However, if opportunities for concurrent reclamation arise for facilities no longer needed, AGC would conduct concurrent reclamation.

In general, the reclamation of surface facilities would include removal of buildings, transmission lines, pipelines, tanks, and other ancillary facilities, regrading surface facilities to blend with the surrounding landscape, redistribution of growth media, and revegetation of disturbed areas. Stormwater diversion ditches that facilitate surface stability would be left in place; others would be backfilled and revegetated. Reclamation activities associated with the underground stages of the Project would include closure of the portal following removal of all underground equipment and facilities.

#### **2.1.9.1 Growth Media and Soil Balance**

No topsoil is available because the Project surface facilities would all be located on previously disturbed and reclaimed facilities. However, the growth media that was used for reclamation of

the previous mining operation facilities would be salvaged and stockpiled. In addition, as additional material is needed, alluvial material located above the portal and the ramp to the portal could be used as a growth media source.

All salvageable topsoil or growth media would be stockpiled, graded to reduce erosion, and seeded with an interim seed mix (Table 2.1-10). Where applicable, berms would serve as stockpiles to reduce the haulage to and from stockpiles.

**Table 2.1-10: Interim Seed Mix**

Species	Scientific Name	Application Rate (Pounds of Pure Live Seed per Acre)
Fourwing saltbush	<i>Atriplex canescens</i>	3.00
Shadscale	<i>Atriplex confertifolia</i>	1.50
Quailbush	<i>Atriplex lentiformis</i>	2.25
Winterfat	<i>Krascheninnikovia lanata</i>	0.25
Streambank wheatgrass, Sodar	<i>Agropyron riparium</i>	3.00
Western wheatgrass, Rosana	<i>Pascopyrum smithii</i>	3.00
Bluebunch wheatgrass, Secar	<i>Pseudoroegneria spicata</i>	2.00
Basin native wildrye	<i>Leymus cinereus</i>	2.00
Bottlebrush squirreltail	<i>Elymus elymoides</i>	0.50
Palmer's penstemon	<i>Penstemon palmeri</i>	0.25
Delar small burnet	<i>Sanguisorba minor</i> , Scop.	1.50
Ladak alfalfa	<i>Medicago sativa</i>	1.50
Blue flax	<i>Linum lewisii</i>	0.50
Western white yarrow	<i>Achillea millefolium</i>	0.25
Forage kochia	<i>Kochia prostrata</i>	0.75
<b>Total</b>		<b>22.25</b>

### 2.1.9.2 Surface Exploration Disturbance Reclamation

Regrading and reshaping of all constructed drill sites, constructed exploration roads, and existing post-January 1, 1981, drill roads utilized for Project-related activities would be completed to approximately the original topography. Fill material, enhanced with growth media, would be pulled onto the roadbeds to fill the road cuts and restore the slope to natural contours. Sumps would be backfilled with the stockpiled spoil pile. Reclamation would be completed with an excavator and dozer as necessary. Following completion of earthwork, all disturbed areas would be seeded as described below in Section 2.1.9.14. Reclamation activities would be conducted concurrently with exploration activities when feasible, including the recontouring of slopes and other earthwork. Slopes would be stabilized prior to final seeding and reclamation.

### 2.1.9.3 Portal and Secondary Escape Way Closure

At the completion of the mining activities, the decline portal would be closed. All equipment and facilities would be removed from the decline. The portal would be plugged and abandoned

similar to water well abandonment requirements (NAC 534.425 through 534.428). These procedures are subject to change based on requirements set forth by the NDWR or the Closure Branch of the BMRR. AGC would consult with the NDWR and BMRR at the time of closure for specific portal closure requirements.

The secondary escape way would be backfilled and capped by concrete. The thickness of the cap would be based on the diameter of the shaft of the escape way, between two and four feet in diameter.

#### 2.1.9.4 RIB System Reclamation

The RIBs would be allowed to drain prior to reclamation. The excavated soil and rock material would be used to backfill the RIBs. This would be covered by the growth media salvaged and stockpiled at the time of construction. The area would then be graded to approximately the pre-exploration topography. Seed from the approved seed mix would be applied in the fall. Seedbed preparation may be required if the site remains fallow during the summer. A harrow or other surface scarification would be needed to provide an adequate seedbed. All surface conveyance and water distribution components would be removed prior to reclamation.

The sediment pond and basins would also be backfilled, regraded, covered with growth media, and seeded. If any pipe is used to convey the water from the pump house to the RIB system, the pipe would be removed, or if buried, the pipe would be left in place with the surface ends cut off, capped, and covered.

#### 2.1.9.5 Waste Rock Dump Facility Reclamation

At closure, the material stored in the WRDF would be pushed to the TOS and evaporation pond areas to maintain containment. AP material remaining in the WRDF at the end of the Project would be encapsulated in the NP waste rock. The WRDF would be completely covered with AN material at an approximate depth of 15 feet to ensure that meteoric runoff does not interact with the AP material.

The WRDF would be reclaimed to reduce slope erosion, provide for mass stability, eliminate benches, and promote successful revegetation. The final slopes would be approximately 3H:1V or shallower. The regraded surface would be covered with growth media and seeded using the approved seed mix.

#### 2.1.9.6 Temporary Ore Stockpile Reclamation

At the time of closure, the TOS area would be used as part of the WRDF closure process. Any ore material remaining in the TOS during closure would remain in the lined facility and encapsulated within NP material during WRDF closure processes.

#### 2.1.9.7 Excavated Soil and Rock Stockpile Reclamation

The excavated soil and rock stockpile would be reclaimed by regrading, redistributing soil and rock material, and seeding.

#### 2.1.9.8 Sedimentation Ponds and Evaporation Pond Reclamation

The sediment ponds would be reclaimed by backfilling, regrading, redistributing of growth media, and seeding. The double-lined evaporation pond associated with the TOS and WRDF would be used to accommodate the WRDF closure.

#### 2.1.9.9 Final Gradient and Slope Stability Technical Criteria

Slope stability analyses were performed on the Cove-Helen TOS and WRDF by Telesto, using industry accepted practices, experience, and material physical properties from similar projects (Appendix E of the Plan). The software program Slide 5.0 (Rockscience 2009) was used to perform limit equilibrium analyses to evaluate both static and pseudostatic slope stability on both transverse and longitudinal sections through the facilities. The influence of seismic loading was modeled using a peak (horizontal) ground acceleration of 0.14 g as reported by the USGS for the site. The desired minimum static factor of safety for both the TOS and WRDF is typically 1.4. Analyses were performed for both circular and block (planar) failure.

The results of the analyses indicate that the TOS and WRDF are stable under static and seismic loading conditions for both operational and closure conditions.

#### 2.1.9.10 Removal of Structures and Ancillary Facilities

All temporary buildings would be decommissioned and removed from the property. Powerlines, water distribution lines, and water tanks would be removed from the property. The temporary shop and wash bay would be dismantled and removed from the site. All concrete pads would be broken and buried in place. The lined laydown yard/ready line would be ripped, graded and seeded following removal of any contaminated soil. The contaminated material would be removed from the site and disposed of at an approved facility. All surface areas would be examined for presence of contaminated soil and any such material would be removed from the site and disposed of at an approved facility.

Salvageable equipment and materials would be used at another facility, sold, or properly disposed of off site. All consumables, such as petroleum products, explosives, and solvents would be removed from the site and used at another facility or returned to the vendor. Synthetic liners used in water management facilities would be cut, folded, and buried on site. Construction debris, piping, and equipment that cannot be salvaged or sold would be removed and disposed in accordance with applicable local, state, and federal regulations. Compacted areas would be ripped prior to the placement of growth media. All ripped and regraded surfaces would be seeded with the approved seed mix.

All electrical transformers and substations would be salvaged or used at other properties. Fences would remain in place until all facilities have achieved vegetation reclamation success. Removal of fences at that time would depend on the grazing management that BLM may implement for the reclaimed facilities. If the fences are not needed for livestock management as determined by the BLM, then AGC would remove all fences. Fuel tanks would be emptied and either used at another property or disposed of in an approved facility. The aggregate over the fuel area liner

would be folded into the liner material and buried in place, following removal and disposition of any contaminated material.

#### 2.1.9.11 Road Reclamation

The haul road, main access road, and all light vehicle roads would be ripped, graded to blend into the surrounding topography, covered with growth media, and seeded. Berms would be used to cover the ripped road surfaces. Sequence of road reclamation would depend on the need to leave some roads open during closure and monitoring. As soon as a road is no longer required, it would be reclaimed. The employee/visitor parking lot would be reclaimed in the same fashion as the roads.

#### 2.1.9.12 Drill Hole Plugging and Monitoring Well Abandonment

Mineral exploration and development drill holes and monitoring wells subject to NDWR regulations would be abandoned in accordance with applicable rules and regulations (NAC 534.425 through 534.428). Boreholes would be sealed to prevent cross contamination between aquifers and the required shallow seal would be placed to prevent contamination by surface access.

Monitoring wells around the RIBs and TOS would be maintained until AGC is released of this monitoring requirement by NDEP. These wells would then be plugged and abandoned in accordance with applicable rules and regulations (NAC 534.425 through 534.428) and to the requirements of the State Engineer.

#### 2.1.9.13 Post-Mining Contours and Topography

The final grading plan for the Project is designed in part to minimize visual impacts through regrading facilities to blend with surrounding topography and interrupt straight-line features. Material would be compacted per specifications in the Quality Assurance Plan that would be developed for the Project.

#### 2.1.9.14 Revegetation, Seeding, and Planting

Reclaimed surfaces would be revegetated to control runoff, reduce erosion, provide forage for livestock and wildlife, and reduce visual impacts. In general, seed would be applied with a rangeland drill on gentle slopes and with a mechanical broadcaster and harrow on steep slopes. Seedbed preparation and seeding would take place in the fall after grading and redistribution of growth media. AGC would consult with the BLM specialists on seeding methods and timing of revegetation activities throughout the reclamation period of the Project in order to ensure a successful outcome.

The seed mix previously used at McCoy/Cove Mine would be used with some modifications for this Project based on the monitoring of the McCoy/Cove facilities. This modification of the McCoy/Cove Mine seed mix includes the species that successfully established on the reclaimed facilities (Table 2.1-11) and has been approved by BLM range specialists. Species that were in the original seed mix but failed to establish have been eliminated from the seed mix.

This mixture includes shrubs, perennial grasses, and forbs and would provide forage and cover similar to the pre-disturbance site vegetation. This mix would also meet the post-Project land uses of livestock grazing and wildlife habitat. In addition, the species included in this list have demonstrated effectiveness in providing erosion protection, the ability to establish within the constraints of low annual precipitation experienced in this area, and their suitability for the site elevation and soil types.

**Table 2.1-11: BLM-Approved Revegetation Seed Mix**

Species	Scientific Name	Application Rate (Pounds of Pure Live Seed per Acre)
Fourwing saltbush	<i>Atriplex canescens</i>	3.00
Shadscale	<i>Atriplex confertifolia</i>	1.50
Quailbush	<i>Atriplex lentiformis</i>	2.25
Streambank wheatgrass, Sodar	<i>Agropyron riparium</i>	3.00
Western wheatgrass, Rosana	<i>Pascopyrum smithii</i>	3.00
Bluebunch wheatgrass, Secar	<i>Pseudoroegneria spicata</i>	2.00
Bottlebrush squirreltail	<i>Elymus elymoides</i>	0.50
Palmer's penstemon	<i>Penstemon palmeri</i>	0.25
Delar small burnet	<i>Sanguisorba minor</i> , Scop.	1.50
Blue flax	<i>Linum lewisii</i>	0.50
Western white yarrow	<i>Achillea millefolium</i>	0.25
Rocky Mountain bee plant	<i>Cleome serrulata</i>	0.25
<b>Total</b>		<b>18.00</b>

2.1.9.15 Proposed Reclamation Schedule

The Project has an anticipated life of three to five years. Reclamation would be initiated as soon as the Project facilities are no longer required. Concurrent reclamation would be conducted when feasible; however, in regards to the surface facilities, there is limited opportunity for concurrent reclamation. The reclamation of the Project is likely to take approximately 18 to 24 months to remove facilities, regrade, distribute growth media, and seed. Monitoring wells would be monitored annually for at least five years following the end of exploration, or as long as required by appropriate governmental agencies and therefore these areas would not be reclaimed. Seeded areas would be monitored for stability and revegetation success, during the spring or fall, for a minimum of three years until attainment of the revegetation standards established in the Nevada Guidelines for Successful Revegetation for the NDEP and the BLM Instruction Memorandum #NV-13. The conceptual reclamation schedule is shown in Table 2.1-12.

**Table 2.1-12: Conceptual Reclamation Schedule**

Year	2019				2020				2021				2022				2023			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Roads, Parking Areas, Yards, Water Treatment Plant, and Berms																				
Buildings																				
Borrows, Ponds, Sumps, RIBs, and Containment Areas																				
Ancillary Facilities																				
Drainages and Culverts																				
Stockpiles, TOS, WRDFs, and Cut Slopes																				
Regrading																				
Portal/Adit Closure/ Escapeway																				
Seeding																				
Post-Closure Revegetation Monitoring																				
Ground Water Monitoring																				
Ground Water Well Abandonment																				

2.1.9.16 Post-Mining Land Use and Reclamation Goals

Major land uses occurring in the Project Area include mineral exploration, livestock grazing, wildlife habitat, and dispersed recreation. Following the decision to close the Project, these same land uses would be restored to the site. These post-mining land uses are in conformance with the RMP. If other sustainable post-mining land uses are identified, AGC would work with the agencies and local governments to meet such land uses.

The objectives of the reclamation plan are to:

- Provide a stable post-mining landform that supports defined land uses;
- Minimize erosion damage and protect water resources through control of water runoff and stabilization of components;
- Establish post-mining surface soil conditions conducive to the regeneration of a stable plant community through salvaging, stockpiling, and redistributing growth media;

- Revegetate disturbed areas with a diverse mixture of plant species in order to establish long-term productive plant communities compatible with existing and planned land uses; and
- Maintain public safety by stabilizing or limiting access to landforms that could constitute a public hazard.

#### **2.1.10 Post-Reclamation Monitoring and Maintenance**

Following the closure of the site facilities, berm and sign maintenance, site inspections, and any other necessary monitoring for the period of reclamation responsibility would be conducted. Monitoring of revegetation success would be conducted after the third growing season and then annually (if necessary) until the revegetation success criteria have been achieved. This would also include noxious weed monitoring and abatement as necessary.

##### **2.1.10.1 Isolation, Removal, and/or Control of Acid-Forming, Toxic, Deleterious Materials**

Ore from the bulk sampling program would be shipped off site, and while on site, the ore would be stored in a lined TOS. Waste rock would be sampled and analyzed quarterly. Any potentially acid generating waste rock would be encapsulated within the WRDF with limestone or other neutralizing material.

#### **2.1.11 Post-Closure Management**

The post-closure management would be implemented by the BLM. The boundary fence could remain in place to create a controlled grazing pasture; however, this would be determined by the BLM. If the fence is not maintained to create a separate pasture, then the fence would be removed by AGC and livestock would have access to the reclaimed surfaces.

#### **2.1.12 Applicant-Committed Environmental Protection Measures**

##### *Air Quality*

- Emissions of fugitive dust from disturbed surfaces would be minimized by utilizing best available control technology. Surface application of water from a water truck and reduced speed limits on dirt access roads is the current method of dust control during high wind conditions.
- The growth media stockpile would be compacted or otherwise treated to reduce windblown particulate matter in high wind conditions.

##### *Cultural Resources*

- Pursuant to 43 CFR 10.4(g), AGC would notify the BLM authorized officer, by telephone, and with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR 10.2). Further pursuant to 43 CFR 10.4(c) and (d), the operator would

immediately stop all activities in the vicinity of the discovery and not commence again for a maximum of 30 days or when notified to proceed by the BLM authorized officer.

- AGC would not knowingly disturb, alter, injure, or destroy any historical or archaeological site, structure, building, or object. If AGC discovers any cultural resource that might be altered or destroyed by operations, the discovery would be left intact and reported to the authorized BLM officer.
- In order to prevent impacts to cultural resources, AGC would avoid eligible or unevaluated cultural sites within the Project Area. AGC would ensure that eligible or unevaluated cultural sites within the Project Area are mapped and flagged by a qualified cultural resource specialist with a global positioning system (GPS) unit prior to surface disturbance.

#### *Erosion and Sediment Control*

- Reseeding would be consistent with all BLM recommendations for mix constituents, application rate, and seeding methods.
- Best Management Practices (BMPs), as identified in the Stormwater Pollution Prevention Plan prepared for the Project, would be used to limit erosion and reduce sediment runoff from Project facilities and disturbed areas during construction and operations.

#### *Fire Management*

- All applicable state and federal fire laws and regulations would be complied with to prevent and suppress fires in the Project Area.
- In the event the Project should start a fire, AGC would be responsible for all the costs associated with suppression. The following precautionary measures would be taken to prevent and report wildland fires:
  - All vehicles would carry fire extinguishers;
  - Adequate firefighting equipment (i.e. shovel, Pulaski tool) and a minimum of ten gallons of water would be kept in the Project Area and in the decline;
  - Vehicle catalytic converters would be inspected often and cleaned of brush and grass debris;
  - AGC would conduct welding operations in an area free from or mostly free from vegetation. A minimum of ten gallons of water and 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;
  - AGC would report wildland fires immediately to the BLM Central Nevada Interagency Dispatch Center at (775) 623-3444; and
  - When operations are conducted during the months of May through September, AGC would contact the BLM Battle Mountain District Office, Division of Fire

and Aviation at (775) 635-4000 to obtain information regarding fire restrictions in place for the area of operation and to advise the office of approximate beginning and ending dates for the activities.

- A defensible space around fire-sensitive equipment utilized in the Project Area would be created. The defensible space would be 2.5 times the average height of the vegetation in the area.

#### *Hazardous or Solid Wastes*

- Pursuant to 43 CFR 8365.1-1(b)(3), no sewage, petroleum products, or refuse would be dumped from any trailer or vehicle.
- Only nontoxic fluids would be used in the drilling process.
- Regulated wastes would be removed from the Project Area and properly disposed of in a permitted state, federal, or local approved disposal area.
- If a spill of a petroleum constituent is considered to meet the reportable quantity per the NDEP's guidelines (greater than 25 gallons or greater than three cubic yards of impacted material or any quantity if released into a waterway or the Cove Pit Lake), or a reportable quantity for hazardous waste is released based on EPA guidelines established under Title III List of Lists (40 CFR Part 302, Table 302.4), the NDEP would be notified within 24 hours, and the appropriate remedial actions and confirmation sampling would be conducted under direction of the NDEP.

#### *Noxious Weeds, Invasive and Nonnative Species*

- Noxious weeds would be controlled through implementation of preventive BMPs and eradication measures if noxious weeds were found. The applicable BMPs and eradication measures would be coordinated with the BLM weed specialist prior to implementation.
- To eliminate the transport of vehicle-borne noxious weed seeds, roots, or rhizomes, all vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities, for emergency fire suppression, or for authorized off-road driving within the Project Area, would be free of soil and debris capable of transporting weeds. All such vehicles and equipment would be cleaned in Battle Mountain with high power or high pressure equipment prior to entering the Project Area. Vehicles used for emergency fire suppression would be cleaned as part of check-in and demobilization procedures. Cleaning efforts would concentrate on tracks, feet, and tires, and on the undercarriage. Special emphasis would be applied to the axles, frames, cross members, motor mounts, on and underneath the steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs would be swept out and refuse would be disposed of in waste receptacles.

### *Migratory Birds*

- In order to avoid potential impacts to breeding migratory birds (including golden eagles [*Aquila chrysaetos*]), a nest survey would be conducted by a BLM approved biologist prior to any surface disturbance associated with exploration activities during the avian breeding season (March 1 through July 31 for raptors and April 1 through July 31 for other avian species). 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 needed. If nests are located, 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 after consultation with the BLM resource specialist, 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 as follows: a) topographic screening; b) distance from disturbance to nest; c) the size and quality of foraging habitat surrounding the nest; d) sensitivity of the species to nest disturbances; and e) the protection status of the species.

### *Native American Concerns*

- Tribal representatives and/or lineal descendants, along with BLM cultural resources specialists, may periodically monitor identified sites (previously identified or inadvertent discovery of any new site). This monitoring may continue throughout the life of the proposed Project.
- With the implementation of the protection, avoidance, and monitoring measures previously described above, no additional mitigation measures are necessary at this time (pending continued consultation). Depending on observed impacts, monitoring, identified mitigation measures, unforeseen impacts, growth of the Project, and continued tribal participation, consultation can occur throughout the life of this Project.

### *Paleontological Resources*

- AGC would not knowingly disturb, alter, injure, or destroy any scientifically important paleontological deposits. If AGC discovers any paleontological resource that might be altered or destroyed by operations, the discovery would be left intact and reported to the authorized BLM officer.

### *Public Safety*

- Public safety would be maintained throughout the life of the Project. All equipment and other facilities would be maintained in a safe and orderly manner.
- The Project Area would remain fenced during the life of the Project to ensure public safety.

- Site access would be restricted to employees and authorized visitors by not allowing unauthorized visitors into the Project Area.

### *Special Status Species*

- There is a potential for pale kangaroo mouse (*Microdipodops pallidus*) and dark kangaroo mouse (*Microdipodops megacephalus*), BLM sensitive species, to occur within the Project Area. A pre-disturbance survey would be performed to check for any large colonies of small mammal burrows within the areas subject to new disturbance that possess the appropriate habitat characteristics. If an area with a number of burrows is present, the area would be avoided if possible. If the burrows cannot be avoided due to the construction of proposed facilities, AGC would consult with the BLM as to if a trapping survey is necessary to confirm presence or absence or other appropriate means of avoiding significant impacts to the species.
- There is a potential for sand cholla (*Opuntia pulchella*), a BLM sensitive species, to occur within the Project Area. A pre-disturbance survey would be performed in the areas subject to new disturbance that possess the appropriate soils to support the species. Any populations of sand cholla detected would be avoided if possible. If the population cannot be avoided due to the construction of proposed facilities, AGC would consult with the BLM on the best method to lessen impacts to the population.

### *Water Quality*

- AGC would follow the Spill Contingency Plan for the Project as outlined in Appendix D of the Plan.
- AGC would comply with the measures outlined in the Storm Water Pollution Prevention Plan, and associated BMPs.

## **2.2 No Action Alternative**

In accordance with BLM NEPA guidelines H-1790-1, Chapter V (BLM 1988), this EA evaluates the No Action Alternative. The objective of the No Action Alternative is to describe the environmental consequences that would result if the Proposed Action were not implemented. The No Action Alternative forms the baseline for which the impacts of all other alternatives can be measured. The subject lands were not withdrawn for any special use and were open unappropriated lands when unpatented mining claims were located. Under the No Action Alternative, AGC would not conduct additional surface exploration activities, and underground bulk sampling and test mining. AGC would continue operations of their surface exploration drilling program (NVN-087927). In addition, reclamation and closure of the existing operations would continue as outlined in existing authorizations. The area would remain available for future mineral exploration and mining activities or for other purposes, as approved by the BLM.

## **2.3 Alternatives Considered but Eliminated from Detailed Analysis**

As part of the NEPA process the BLM considered several alternatives to the Proposed Action. The following is a discussion of those alternatives that have been eliminated from detailed consideration in this EA.

### Modified Surface Exploration Activities Alternative

Under the Modified Surface Exploration Activities, the underground portion of the Project would commence as outlined in the Proposed Action. However, the proposed surface exploration activities would be conducted in a manner that would minimize or eliminate new road construction. Under the Proposed Action, 100 acres of surface exploration could occur anywhere in the Project Area including areas that do not have proposed facilities. AGC would only use existing roads, overland or cross country travel and would not allow for the construction of new roads for exploration activities. Utilization of cross county travel exclusively for the Project would eliminate much of the exploration area due to topographic limitations and lack of existing roads throughout the Project Area. An alternative that eliminates access to portions of the Project Area, which is located in an area that is open to mineral entry and not closed to off-road use, would deny the mining claimant the opportunity to fully evaluate and characterize the mineral potential. However, the Proposed Action incorporates the use of cross country travel and would utilize this method where feasible. For these reasons, the Modified Surface Exploration Activities Alternative does not meet the purpose and need of the Project and has been eliminated from detailed consideration.

### Modified Surface Facility Layout Alternative

The Modified Surface Facility Layout Alternative considered different locations for surface facilities. Changing the location of the WRDF, RIBs, and stockpiles from the planned location on previously disturbed and reclaimed areas would potentially increase the disturbance in undisturbed areas and would potentially create additional impacts to wildlife habitat, water resources, cultural resources, and soils and vegetation, or cause greater impacts to those affected resources. This alternative would meet the purpose and need of the Project, but would have a greater overall impact to the environment. Therefore, this alternative was eliminated from detailed consideration.

### Processing Onsite Alternative

The Processing Onsite Alternative considered the construction and operation of processing facilities within the Project Area to test the ore material instead of transporting the material offsite for metallurgical testing. Since the purpose of the surface exploration activities and the underground bulk sampling activities is to further define the resource present and develop a feasibility study that evaluates the different processing scenarios, constructing and operating process facilities at the site would premature. The construction and operation of processing facilities onsite would create extra surface disturbance and result in a longer closure and monitoring scenario. This alternative would meet the purpose and need of the Project but would have a greater overall impact to the environment, as it would prolong the life of the Project and closure and reclamation of the Project. Therefore, this alternative was eliminated from further consideration.

### 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

#### 3.1 Introduction

The purpose of this section of the EA is to describe the existing environment of the Project Area, as well as environmental consequences from implementation of the Proposed Action. The Project Area has been previously mined and reclaimed as described in Section 1.2 and shown in Figure 1.1.2. The Project Area and vicinity was actively mined between 1987 and 2001. The property has been in closure since 2006, which includes the management of the Cove Pit Lake. As described in Great Basin Ecology, Inc.'s (GBE's) 2010 Baseline Report, all of the proposed surface facilities associated with the Proposed Action would occur in areas that have been previously disturbed from mining. With the exception of the surface exploration activities that could occur anywhere inside the Project Area, AGC has elected to work within existing disturbance footprints and utilize existing facilities and infrastructure to reduce the level of disturbance associated with the Project. This existing baseline condition of the Project Area serves as the basis for the analysis of the Proposed Action.

Supplemental Authorities that are subject to requirements specified by statute or Executive Order must be considered in all BLM environmental documents. The elements associated with the supplemental authorities listed in the NEPA Handbook (BLM 2008, Appendix 1) and in the Nevada Instruction Memorandum 2009-030, Change 1, are listed in Table 3.1-1. The table lists the elements and the determination whether the element is present in the Project Area and whether it would be affected by the Proposed Action.

**Table 3.1-1: Elements Associated with Supplemental Authorities and Rationale for Detailed Analysis for the Proposed Action**

Supplemental Authority Element	Not Present	Present/ Not Affected	Present/May Be Affected	Rationale/Reference Section
Air Quality			X	See Section 3.2.1.
Areas of Critical Environmental Concern (ACEC)	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Bald and Golden Eagles			X	See Section 3.2.13 (Special Status Species).
Cultural Resources		X		See Section 3.2.2.
Environmental Justice	X			No minority or low-income groups would be disproportionately affected by health or environmental effects as a result of implementation of the Proposed Action. This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Farm Lands (Prime or Unique)	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Fish Habitat	X			Native fish habitat is not present within the Project Area or vicinity and is not further analyzed in this EA. Refer to Section 3.2.19 for a further discussion.

<b>Supplemental Authority Element</b>	<b>Not Present</b>	<b>Present/ Not Affected</b>	<b>Present/May Be Affected</b>	<b>Rationale/Reference Section</b>
Floodplains	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Forests and Rangelands (Healthy Forest Restoration Act [HFRA] projects only)	X			This project does not meet the requirements to qualify as an HFRA project.
Human Health and Safety (Herbicide Projects)	X			The Project may use herbicides to eradicate noxious weeds; however, Executive Order (EO) 13045, "Protection of Children from Environmental Health Risks and Safety Risks", would not apply to this Project as there would be no children on the site.
Migratory Birds			X	See Section 3.2.6.
Native American Traditional Values			X	See Section 3.2.7.
Noxious Weeds, Invasive Nonnative Species			X	See Section 3.2.8.
Threatened or Endangered Species	X			Federally threatened and endangered species have been determined not to be present within the Project Area. See Section 3.2.13 (Special Status Species) for a further discussion.
Wastes – Hazardous/Solid			X	See Section 3.2.17.
Water Resources			X	See Section 3.2.18.
Wetlands and Riparian Zones	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Wild and Scenic Rivers	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Wilderness/Wilderness Study Areas (WSAs)/Lands with Wilderness Characteristics	X			Wilderness or WSAs are not present within the Project Area or vicinity. The Project Area is substantially affected by human imprints as it was an active mine site, does not have opportunities for solitude or primitive recreation, and does not have an adequate size to contain land with wilderness characteristics. These elements are not further analyzed in this EA.

Elements that are present are analyzed in Section 3.2, including justification for the resources that are present and determined not to be affected by the Proposed Action. In addition, a couple elements that are not present are discussed in Section 3.2 as to how they were determined not to be present. Those elements listed under the supplemental authorities that do not occur in the Project Area and would not be affected are not discussed further in this EA, based on the rationale provided for in Table 3.1-1.

In addition to the elements listed under supplemental authorities, the BLM considers other resources and uses that occur on public lands and the issues that may result from the implementation of the Proposed Action. Other resources or uses of the human environment that have been considered for this EA are listed in Table 3.1-2 below.

**Table 3.1-2: Resources or Uses Not Associated with Supplemental Authorities**

Other Resources or Uses	Not Present	Present/ Not Affected	Present/May Be Affected	Rationale/Reference Section
Fire Management		X		See Section 3.2.3.
Forestry and Woodland Resources	X			Resource is not present and is not further addressed in this EA.
Geology and Mineral Resources			X	See Section 3.2.4.
Land Use and Realty		X		See Section 3.2.5.
Paleontological Resources		X		See Section 3.2.9.
Rangeland Management		X		See Section 3.2.10.
Recreation	X			The Project Area is currently fenced and does not allow for recreational opportunities; therefore, this land use is not further addressed in this EA.
Socioeconomic Values			X	See Section 3.2.11.
Soils			X	See Section 3.2.12.
Special Status Species (Plants and Wildlife)			X	See Section 3.2.13.
Transportation and Access			X	See Section 3.2.14.
Vegetation			X	See Section 3.2.15.
Visual Resources		X		See Section 3.2.16.
Wild Horses and Burros	X			The Project Area is not located in a Herd Management Area and the proposed operations area is fenced and precludes any wild horse use; therefore, this resource is not further addressed in this EA.
Wildlife			X	See Section 3.2.19.

Resources or uses that are present are discussed and analyzed in Section 3.2, including justification for the resources that are present and determined not to be affected by the Proposed Action. Those other resources listed that do not occur in the Project Area and would not be affected are not discussed further in this EA, based on the rationale provided for in Table 3.1-2.

The potential effects of the No Action Alternative on both supplemental authorities and other resources or uses are discussed in Section 3.3.

## **3.2 Effects of the Proposed Action**

### **3.2.1 Air and Atmospheric Values**

The analysis of air quality includes the potential impacts within the Project Area and off-site ore processing. Impacts within the Project Area include ambient air pollutants, factors influenced by climate and meteorology, and climate change. Off-site impacts to air quality pertain to mercury emissions from processing the ore extracted at Cove Helen for test mining.

#### **3.2.1.1 Affected Environment**

##### *Air Quality*

##### Project Area

The Federal Clean Air Act is the primary controlling legislation over air quality. Ambient air quality and the emission of air pollutants are regulated under both federal and state laws and regulations. Regulations potentially applicable to the Proposed include the following: National Ambient Air Quality Standards (NAAQS) and the Nevada State Ambient Air Quality Standards (NSAAQS).

The Bureau of Air Pollution Control (BAPC) is the agency in the State of Nevada that has been delegated the responsibility for implementing a State Implementation Plan (SIP) (excluding Washoe and Clark Counties, which have their own SIP). Included in a SIP are the State of Nevada air quality permit programs (NAC 445B.001 through 445B.3791, inclusive). Also part of a SIP is the NSAAQS. The NSAAQS are generally identical to the NAAQS, with the exception of the following: (a) an additional standard for carbon monoxide (CO) in areas with an elevation in excess of 5,000 feet amsl; (b) a hydrogen sulfide standard; and (c) a violation of state standards occurs with the first annual exceedance of an ambient standard, while federal standards are generally not violated until the second annual exceedance. In addition to establishing the NSAAQS, the BAPC is responsible for permit and enforcement activities throughout the State of Nevada (except Clark and Washoe Counties).

The Project Area is located in the Lower Reese River Valley airshed within the Central Hydrographic Region, which is considered in attainment/unclassifiable relative to the federal air quality standards. The existing air quality is typical of largely undeveloped regions of the western United States with limited sources of pollutants.

Baseline air quality monitoring of ambient concentrations of CO, nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>) or sulfur dioxide (SO<sub>2</sub>) has not been performed in the region in which the Project is located. Monitoring is conducted in areas typical of high population densities, which is not representative of the undeveloped region that the Project lies within. Monitoring data for remote regions like that of the Project location is not readily available and most of the air quality monitoring conducted by the State of Nevada is performed in the Reno/Carson City and Las Vegas areas. Particulate matter with particles size less than ten microns in size (PM<sub>10</sub>) has been collected at the Cove Pit Lake and at the Phoenix mine sites, but these stations were/are operated during ongoing activities at the respective mine sites and are not likely representative of baseline air

quality in the region. Other PM<sub>10</sub> sites have been operated in the towns of Battle Mountain and Elko, Nevada. Limited data for particulate matter with particles size less than 2.5 microns in size (PM<sub>2.5</sub>) has been collected and the data that have been collected is generally from more urban settings. The BAPC does not normally include a background concentration for air quality analyses conducted for projects located in rural areas for any criteria pollutant other than PM<sub>10</sub> (Compliance Partners Inc. 2011).

Ambient concentrations of PM<sub>10</sub> collected at the Round Mountain Monitoring Station are considered representative of the air quality for the Project region. This monitoring location is in Nye County, Nevada that has similar geography and weather characteristics. The other criteria pollutant background concentrations were downloaded from the EPA's AirExplorer (<http://www.epa.gov/airexplorer/>) or AirData (<http://www.epa.gov/air/data/index.html>) websites. The air monitoring sites in Nevada which collect NO<sub>2</sub>, CO, and SO<sub>2</sub> concentrations are located close to or inside of urban areas and would not be representative of the concentrations found near the Project Area. Two sites in rural California, Trona and Barstow were determined to be more representative of the type of concentrations that exist near the Cove-Helen Site. For PM<sub>2.5</sub>, the upwind monitoring site outside northern Las Vegas, Nevada, was determined to be representative of background concentrations near the Project Area.

Table 3.2-1 summarizes the background or baseline ambient air quality concentrations for the criteria air pollutants that are relative or representative of Project regional location.

**Table 3.2-1: Baseline Ambient Air Quality**

Pollutant	Averaging Period	Background Concentration		Years Reviewed	Location
		ppm	µg/m <sup>3</sup>		
CO	8-hour	1.500	1,718.4	2003-2008	Barstow, California
	1-hour	3.500	4,0009.6		
NO <sub>2</sub>	annual	0.002	3.8	2005-2010	Trona, California
	1-hour	0.011	21.3		
PM <sub>10</sub>	24-hour	--	39.0	1994-1996	Round Mountain, Nevada
	annual	--	15.0		
PM <sub>2.5</sub>	annual	--	4.2	2003-2008	North Las Vegas, Nevada
	24-hour	--	10.2		
SO <sub>2</sub>	annual	0.001	2.6	2003-2008	Trona, California
	24-hour	0.005	13.1		
	3-hour	0.017	44.5		
	1-hour	0.008	20.1		

Source: Compliance Partners, Inc. 2011

Notes: µg/m<sup>3</sup> = micrograms per cubic meter; ppm=parts per million

### Off-Site Ore Transport

A quantification of truck emissions associated with the off-site transport of 60,000 tons per year (tpy) of ore from Cove-Helen to either Jerritt Canyon or Newmont Carlin Mill 6 was performed by Compliance Partners, Inc. in February 2012 to accommodate for the following potential emissions: PM<sub>2.5</sub>; PM<sub>10</sub>; nitrogen oxides (NO<sub>x</sub>); CO; and SO<sub>2</sub>. Table 3.2-2 below shows the total estimated yearly emissions for the listed pollutants.

**Table 3.2-2: Total Potential Truck Traffic Emissions**

PM <sub>10</sub>	PM <sub>2.5</sub>	CO	NO <sub>x</sub>	SO <sub>2</sub>
0.192 tpy	0.186 tpy	1.435 tpy	2.634 tpy	0.003 tpy

Source: Compliance Partners, Inc. 2012

Off-Site Ore Processing

Ore from the Project would be tested and processed at either the Jerritt Canyon facility or the Newmont Carlin Mill 6 facility. One-way distances between the Project and these mills are estimated to be 149 miles and 86 miles, respectively. The Jerritt Canyon facility has been issued a Class I Air Quality Operating Permit (No. AP1041-0778) by the NDEP that limits the amount of ore that may be processed and mercury emissions. Similarly, the Newmont Carlin Mill 6 facility has been issued both a Class I Air Quality Operating Permit (No. AP1041-0793) and a Mercury Operating Permit to Construct (No. AP1041-2219) that limits the amount of ore that may be processed and that limits mercury concentrations in various process units that inherently limit mercury emissions. These permit set forth federally enforceable conditions that may not be exceeded. As such, regardless of where ore originates or its mercury content, the maximum potential mercury impact to the environment would not increase without first securing a modification to any of these permits, which is not anticipated as part of this Project. The processing of ore from the Project would not result in an increase in potential mercury environmental impacts that are currently allowable from either facility.

Incremental environmental impact of mercury would occur above the current levels as a result of testing and processing the additional ore from the Project at either of the proposed processing facilities. This incremental impact is estimated based on work conducted by Compliance Partners, Inc. These estimates were determined from the contribution of predicted mercury deposition that may be attributed to the processing of ore from the Project at each of the facilities. The total amount of ore processed during the 2010 operating year as reported in NDEP emission inventories was 578,089 and 3,293,216 tpy for the Jerritt Canyon and Carlin Mill 6 facilities, respectively. The maximum annual amount of Project ore anticipated to be processed by either of these facilities is 60,000 tons per any given year (120,000 tons for the life of the Project). The incremental impact of processing Project ore at the Jerritt Canyon facility would be at most ten percent of the 2010 Jerritt Canyon contributions to the statewide average global background deposition. Similarly, the incremental impact of processing Project ore at the Carlin Mill 6 facility would be at most less than two percent of the 2010 Carlin Mill 6 contribution to the statewide average global background deposition (Compliance Partners, Inc. 2011).

*Climate and Meteorology*

The Project Area is located in the northern portion of the Fish Creek Mountains. The climate and vegetation in the Project Area are typical of the arid climate of the central portion of the northern Basin and Range Province. The climate receives low to moderate levels of precipitation, with moderate fluctuations in seasonal temperatures, and the average annual precipitation is 8.13 inches. Temperatures during the winters are cool with periods of very cold weather with the lowest average temperature in January of 15.7 degrees Fahrenheit (°F). The summers are hot and dry with the highest average monthly temperature in July of 94 °F. These temperatures represent data collected in Battle Mountain, Nevada, located 25 miles north of the Project Area. The

average daily temperature at the Project site is 50.7 °F, with an annual average precipitation of 9.01 inches (Compliance Partners Inc. 2011). Elevation in the Project Area ranges between 4,724 to 5,767 feet amsl.

### *Climate Change*

According to the BLM's Instruction Memorandum (IM) No. 2008-171, "Guidance on Incorporating Climate Change into Planning and NEPA Documents," dated August 19, 2008, climate change considerations should be acknowledged in EA documents. The IM states that ongoing scientific research has identified the potential impacts of anthropogenic (man-made) greenhouse gas (GHG) emissions and changes in biological carbon sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks 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 carbon dioxide equivalent concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations" (IPCC 2007).

Several activities contribute to the phenomena of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs would have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 100 years.

Current emissions within the vicinity of the Project Area include vehicle combustion emissions and fugitive dust from travel on unimproved roads and ranch activities, and wildland fires, mining and reclamation, and recreational activity. Emissions of all pollutants are generally expected to be low due to the extremely limited number of sources in the vicinity of the Project Area. Existing climate prediction models are global in nature; therefore, they are not at the appropriate scale to estimate potential impacts of climate change within the Lower Reese River Valley airshed in which the Project is located. Due to the nature and scale of the Proposed Action, effects on climate change are not further analyzed in this EA.

#### 3.2.1.2 Environmental Consequences

##### *Air Quality*

##### Project Area

Compliance Partners, Inc. prepared an emissions inventory for the Project and conducted an ambient air quality impact analysis to assess the impact of the Proposed Action on surrounding areas (Compliance Partners, Inc. 2011). The analysis area represents the existing Newmont fence

line and the proposed fence line shown in Figures 1.1.2 and 2.1.1. The analyses were performed in accordance with the Ambient Air Modeling Protocol prepared for the Project with input and approval from the BLM (Compliance Partners, Inc. 2011).

Activities associated with the Project that may be potential sources of criteria air pollutants would occur both on the surface and underground. These sources would emit criteria air pollutants including nitrogen oxides (NO<sub>x</sub>), CO, SO<sub>2</sub>, volatile organic compounds (VOCs), and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). The potential aboveground sources have been identified as the two diesel fired stationary engines, mobile sources such as haul trucks, fugitive dust from vehicle travel on roadways, and storage pile wind erosion. The potential underground sources have been identified as diesel fired equipment, drilling activities, and the use of explosives for blasting material. Table 3.2-3 summarizes the results of the emissions inventory for the Proposed Action.

**Table 3.2-3: Emissions Inventory Results**

Description	Emissions (tpy)					
	NO <sub>x</sub>	CO	VOCs	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Backup Generator	19.25	11.38	1.75	0.01	0.66	0.66
Primary Generator	2.85	1.68	0.26	<0.01	0.10	0.10
Diesel Fuel Storage Tanks	0	0	<0.01	0	0	0
Explosives	0.59	2.31	0	0.07	15.47	0.89
Drilling	0	0	0	0	2.82	0.28
Underground Equipment	20.71	20.81	3.06	0.04	1.69	1.52
Surface Vehicles	0.54	3.11	5.06	0	0.04	0.04
Roadway Fugitive Dust	0	0	0	0	16.33	1.63
Wind Erosion	0	0	0	0	18.86	2.83
<b>Total</b>	<b>43.94</b>	<b>39.29</b>	<b>10.14</b>	<b>0.13</b>	<b>55.97</b>	<b>7.95</b>

Source: Compliance Partners, Inc. 2011  
 Notes: tpy = tons per year; < = less than

Compliance Partners, Inc. used the EPA AERMOD modeling suite for the ambient air quality impact analysis. The results of the modeling indicated that the maximum predicted ambient air concentrations generated from the Project meet the NAAQS and the NSAAQS for CO, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub>. The maximum predicted concentrations, which include background concentrations, are presented in Table 3.2-4.

**Table 3.2-4: Maximum Predicted Pollutant Ambient Air Concentrations**

Pollutant	Averaging Period	Maximum Predicted Concentration (µg/m³)	Primary NAAQS (µg/m³)	Secondary NAAQS (µg/m³)	NSAAQS (µg/m³)
CO	1-hour	4,532.701	40,000	N/A	40,500
	8-hour	1,794.575	10,000	N/A	7,000
NO <sub>2</sub>	1-hour	171.329	188	N/A	N/A
	Annual	9.028	100	Same as Primary	100
PM <sub>2.5</sub>	24-hour	32.282	35	Same as Primary	N/A
	Annual	4.968	15	Same as Primary	N/A
PM <sub>10</sub>	24-hour	79.896	150	Same as Primary	150
	Annual	22.621	N/A	N/A	50
SO <sub>2</sub>	1-hour	21.230	196	N/A	N/A
	3-hour	45.363	N/A	1,310	1,300
	24-hour	13.268	366	N/A	365
	Annual	2.622	78	N/A	80

Source: Compliance Partners, Inc. 2011

Notes: µg/m³ = micrograms per cubic meter; N/A = not applicable

AGC has obtained a Class II Operating Permit from the BAPC for the Project and would comply with all permit stipulations. The Proposed Action does not include any material processing on site that would generate mercury emissions. As outlined in Section 2.1.12, fugitive dust would be controlled by water trucks and utilization of other BMPs. The growth media stockpile would be compacted to reduce the windblown dust from the pile. Speed limits on access roads would be observed and travel on roads within the Project Area would be conducted at speeds of 15 to 20 miles per hour. Reclamation of surface disturbance would gradually eliminate any potential for long-term impacts to air resources. Any potential temporary impacts to air resources would cease once activities and reclamation are completed, and would not exceed the NAAQSs or the NSAAQSs.

Off-Site Ore Transport and Processing

Vehicle emissions would result from the use of trucks to transport ore off-site to the processing facilities at either Newmont Carlin Mine 6 or Jarrett Canyon, which are located 86 miles and 149 miles from the Project, respectively. Vehicle emissions are regulated by standards placed on engine manufacturers. Compliance Partners, Inc. estimated the vehicle emissions that would be generated for the transport of the ore material from the Project Area to the mills. The extreme scenario of eight truck trips a day, five days a week was used to estimate the emissions. The offsite vehicle emissions are summarized in Table 3.2-5.

**Table 3.2-5: Off-site Vehicle Emissions Summary**

Description	Emissions (tpy)					
	NO <sub>x</sub>	CO	VOCs	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Offsite Transport – Haul Trucks	2.63	1.44	13.03	0.003	0.19	0.19

Source: Compliance Partners, Inc. 2011

Ambient air quality impacts for the transportation of ore material off-site to processing facilities was modeled using AERMOD with the same meteorological data sets that were used for the onsite analyses. The modeled concentrations do not exceed the NAAQSs or the NSAAQSs as outlined in Table 3.2-6.

**Table 3.2-6: Maximum Predicted Pollutant Ambient Air Concentrations for Off-Site Ore Transport**

Pollutant	Averaging Period	Maximum Predicted Concentration ( $\mu\text{g}/\text{m}^3$ )	Primary NAAQS ( $\mu\text{g}/\text{m}^3$ )	Secondary NAAQS ( $\mu\text{g}/\text{m}^3$ )	NSAAQS ( $\mu\text{g}/\text{m}^3$ )
CO	1-hour	39.8	40,000	N/A	40,500
	8-hour	11.5	10,000	N/A	7,000
NO <sub>2</sub>	1-hour	32.8	188	N/A	N/A
	Annual	3.4	100	Same as Primary	100
PM <sub>2.5</sub>	24-hour	1.9	35	Same as Primary	N/A
	Annual	0.5	15	Same as Primary	N/A
PM <sub>10</sub>	24-hour	5.2	150	Same as Primary	150
	Annual	1.5	N/A	N/A	50
SO <sub>2</sub>	1-hour	0.06	196	N/A	N/A
	3-hour	0.04	N/A	1,310	1,300
	24-hour	0.01	366	N/A	365
	Annual	<0.01	78	N/A	80

Based on the modeling performed for the Project, the Project would not exceed the NAAQSs or the NSAAQSs and, therefore, no direct impacts to air and atmospheric resources are anticipated to result from the Proposed Action. However, a qualitative cumulative analysis is included in Chapter 4 that recognizes that emissions would be generated from the Project and evaluates their contribution to current and future emission sources in the Project Area and along the offsite transportation routes.

The maximum annual amount of ore from the Project anticipated to be tested and processed by either the Jerritt Canyon or Newmont Carlin Mill 6 is 60,000 tons per any given year (120,000 tons for the life of the Project). The incremental impact of processing ore from the Project at the Jerritt Canyon facility would be at most ten percent of the 2010 Jerritt Canyon contributions to the statewide average global background deposition. Similarly, the incremental impact of processing Cove-Helen ore at the Carlin Mill 6 facility would be at most less than two percent of the 2010 Carlin Mill 6 contribution to the statewide average global background deposition. However, regardless of where ore originates or mercury content of the ore, the maximum potential mercury impact to the environment would not increase without first securing a modification to the mill facility permits described above, which is not anticipated as part of this Project. The testing and processing of ore from the Project would not result in an increase in potential mercury environmental impacts that are currently allowable from either facility.

### **3.2.2 Cultural Resources**

#### **3.2.2.1 Affected Environment**

The area of potential effects (APE) consists of approximately 2,280 acres. Between 1978 and 1997, sixteen prior cultural resource inventories have been conducted within the APE, and within the vicinity of the APE. Of the 2,280 acres comprising the APE, all have been the subject of prior cultural resource inventories; 1,995 acres have been inventoried to Class III standards and 283 acres have been inventoried to Class II standards. Archaeological investigations have been conducted more recently for the Notice-level activities (Kautz 2010 and Kautz 2010a).

The inventories recorded a total of 96 archaeological sites, of which only 12 sites fall completely or partially within the current APE boundary. These include nine small prehistoric lithic scatters or isolated finds, a historic refuse scatter, a historic animal trap, and a rockshelter location with prehistoric items. The rockshelter (Cuchine Rockshelter) was determined eligible for listing on the National Register of Historic Places (NRHP). The historic animal trap (deadfall animal trap) was not evaluated during the course of the inventory. The cultural report (Price 1987) recommended that the rockshelter should be avoided, but the trap was not discussed in the recommendation section of the report. All of these resources, including the eligible rockshelter and unevaluated historic features, have been partially or completely destroyed by mining development at the McCoy Mine, which predates the present Proposed Action (GBE 2010).

#### **3.2.2.2 Environmental Consequences**

Based on the cultural resources survey conducted for the proposed Project there are cultural resources within the Project Area; however, the majority of the sites were previously destroyed, and the one partially intact site would be avoided. No facilities are proposed in the vicinity of the one cultural site. The locations of the surface exploration activities would be submitted to the BLM prior to surface disturbance for approval, which would ensure that this site is avoided and appropriate buffer is established around the site. As outlined in the environmental protection measures in Section 2.1.12, any undiscovered eligible or unevaluated site within the Project Area would be mapped and flagged with a GPS unit prior to surface disturbance by a qualified cultural resource specialist. Therefore, no impacts to cultural resources are anticipated as a result of implementation of the Proposed Action. No impacts to cultural resources from the Proposed Action are anticipated; therefore, cultural resources is not further analyzed in this EA.

### **3.2.3 Fire Management**

#### **3.2.3.1 Affected Environment**

No fuel reduction or habitat enhancement projects have been conducted or are proposed within the Project Area; however, the BLM has ongoing hazardous fuels reduction and habitat enhancement projects in the Project Area vicinity.

### 3.2.3.2 Environmental Consequences

Implementation of the Proposed Action would be coordinated with the BLM's Mount Lewis Field Office Manager in order to ensure the safety of AGC personnel during all periods of prescribed fire activity in the area. Based on the environmental protection measures outlined in Section 2.1.12, and the fact that the Project Area would continue to be accessible, impacts to fire management are not anticipated. In addition, reclamation measures include seeding with vegetation types that may be more favorable than other vegetation types to fire avoidance and suppression in the long term.

No impacts to fire management from the Proposed Action are anticipated; therefore, fire management is not further analyzed in this EA.

### 3.2.4 **Geology and Mineral Resources**

#### 3.2.4.1 Affected Environment

The Project Area is located in the East Gold Belt, which runs parallel to the Battle Mountain Gold Belt. The geology of the McCoy Mining District and the Project Area consists of lithologic units Triassic through Tertiary in age with Quaternary surface deposits. The surface geology within the Project Area has been altered by the past mining and reclamation activities. Geologic and mineral resources within the Project Area have been extracted and modified by the past mining operations including the excavation of an open pit, removal of ore, and the crushing and deposition of rocks on the WRDFs. Therefore, the surficial geologic formations that were present prior to the development of the Project Area may no longer be intact or have been disturbed. Nonetheless, the general stratigraphy of the Project Area is the Dixie Valley Formation, which consists of interfingering units of dolomitic sandstones, and conglomerates. The Dixie Valley Formation is overlain by the Farvet Formation, which consists of limestone overlain by an approximately 33 to 43-foot-thick section of calcareous shale (Kuyper et al. 1991). The Augusta Mountain Formation overlays the Farvet Formation and consists of three primary members including the Home Station Member, Panther Canyon Member, and Smelser Pass Member. The Home Station Member is massive calcareous dolomitic limestone, ranging in thickness from 300 to 400 feet (Emmons and Eng 1995), and contains intermittent sandstone and conglomerate lenses (Kuyper et al. 1991).

In 2003, Johnson characterized the Home Station Member as a variety of thickly bedded silty dolostones. Kuyper et al. described the contact between the Home Station Member and the overlying Panther Canyon Member as gradual; however, Johnson described this contact as sharp, based on observations in the Cove open pit. The Panther Canyon Member is informally divided into the lower dolostone and upper transitional submembers. The lower dolostone submember is a well-bedded medium gray dolostone with stromatolitic texture (Emmons and Eng 1995). The contact with the lower dolostone submember and overlying upper transitional submember is gradual. The upper transitional submember is composed of a sequence of inversely graded lithologies beginning with dolostone and coarsens to silty and sandy dolostone, carbonate cemented silt and sandstone, and finally conglomerate. The contacts between the lithologies composing the upper transitional submember tend to be abrupt and the lithologic bodies themselves are more lensoid in nature rather than continuous bedding. The Smelser Pass Member

overlays the Panther Canyon Member with an average thickness of 900 feet. The Smelser Pass Member is primarily composed of microcrystalline limestone with abundant recrystallized bioclasts. The lower 400 feet of the Smelser Pass Member is thickly bedded massive limestone. The upper 500 feet contain thinly laminated calcareous shale bedding. There is extensive evidence of supergene oxidation in this Member. The Smelser Pass Member is unconformably overlain by the Caetano Tuff (Kuyper et al. 1991). The Caetano Tuff has a maximum thickness in the Project Area of 300 feet and 40 percent composition of phenocrysts and 60 percent matrix. Discontinuous Tertiary felsic dikes along with other younger basaltic dikes and sills cross-cut the lithology in the Project Area. Quaternary sediments at the Project Area consist of unconsolidated alluvium, talus, and colluvium that are cumulatively less than 220 feet thick (Emmons and Eng 1995).

The structural geology of the Project Area includes two primary intersecting structures, which define the Helen Intersection Zone. Gold mineralization in the Project Area is characterized as “Carlin-style” due to the disseminated nature of its occurrence and association with pyrite and arsenopyrite. An envelope characterized by decalcification, silicification, and argilization accompanied by anomalous amounts of silver, arsenic, antimony, and mercury often accompanies mineralization.

#### 3.2.4.2 Environmental Consequences

The Proposed Action would not involve the removal of large volumes of earth that could potentially lead to structural instability. Only the removal of earth for diamond drilling and bulk sampling would occur, which includes the removal of up to 120,000 tons of ore and 99,000 tons of waste over the life of the Project. The test mining and bulk sampling from the decline have a potential beneficial impact by further defining a mineral resource and evaluating parameters to develop the resource. These activities are not anticipated to result in negative impacts to geology and mineral resources. These resources are not analyzed further in this EA.

### **3.2.5 Land Use and Realty**

#### 3.2.5.1 Affected Environment

The entire Project Area is located on public lands administered by the BLM MLFO, consisting of seven patented claims owned by Newmont and leased to AGC. Figure 1.1.2 shows the Project Area, access roads, and land ownership status. The current land uses in the vicinity of the Project Area consist primarily of open pit mining, mineral exploration, livestock grazing, wildlife habitat, and recreational use. No ROWs are located in the Project Area. The Project would be accessed via the existing McCoy/Cove Mine access road (paved road). The access to the Project entrance from the main access road (compacted surface dirt road) would be upgraded to be 25 feet wide with a two-foot road-side “V” ditch on each side of the road. The road widening would account for 10.89 acres of surface disturbance. The Project Area is currently fenced due to the past and ongoing mineral exploration and mining activities.

### 3.2.5.2 Environmental Consequences

No change in land use in the Project Area would result from the Proposed Action and no real estate transactions are proposed. Therefore, no impacts to land use and realty would result from the Proposed Action. No impacts to land use and realty from the Proposed Action are anticipated; therefore, land use and realty are not further analyzed in this EA.

### 3.2.6 **Migratory Birds**

#### 3.2.6.1 Affected Environment

"Migratory bird" means any bird listed in 50 CFR 10.13. All native birds found commonly in the United States, with the exception of native resident game birds that do not migrate, are protected under the Migratory Bird Treaty Act of 1918 (MBTA). The MBTA prohibits taking of migratory birds, their parts, nests, eggs, and nestlings. EO 13186, signed January 10, 2001, directs federal agencies to protect migratory birds by integrating bird conservation principles, measures, and practices into projects.

The migratory bird species that may inhabit an area is dependent upon the habitat available. The majority of the Project Area was previously disturbed by mining activity (McCoy-Cove Mine) and subsequently reclaimed, except for the open pit. The reclamation seed mix that was used at McCoy-Cove consisted of salt desert shrub species that included the following: fourwing saltbush (*Atriplex canescens*); shadscale (*Atriplex confertifolia*); quailbush (*Atriplex lentiformis*); and winterfat (*Krascheninnikovia lanata*). Also included in the seed mix were several wheatgrasses including: streambank wheatgrass (*Elymus lanceolatus* ssp. *psammophilus*); Western wheatgrass (*Pasopyrum smithii*); and bluebunch wheatgrass (*Pseudoroegneria spicata prostrate*).

Baseline surveys for wildlife species, including migratory birds and raptors, were conducted by GBE in 2010 for the majority of the Project Area and surrounding area (GBE 2010). Table 3.2-7 lists the bird species that were observed within the Project Area during a 2010 site survey conducted by GBE.

**Table 3.2-7: Migratory Bird Species Detected in the Project Area**

Common Name	Scientific Name
American kestrel	<i>Falco sparverius</i>
American robin	<i>Turdus migratorius</i>
Black-billed magpie	<i>Pica pica</i>
Black-throated sparrow	<i>Amphispiza bilineata</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
<b>Brewer's sparrow</b>	<b><i>Spizella breweri</i></b>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Green-tailed towhee	<i>Pipilo chlorurus</i>
Horned lark	<i>Eremophila alpestris</i>

Common Name	Scientific Name
Killdeer	<i>Charadrius vociferous</i>
Lark sparrow	<i>Chondestes grammacus</i>
<b>Loggerhead shrike</b>	<b><i>Lanius ludovicianus</i></b>
Mourning dove	<i>Zenaida macroura</i>
Common nighthawk	<i>Chordeiles minor</i>
Rock wren	<i>Salpinctes obsoletus</i>
Sage sparrow	<i>Amphispiza belli</i>
<b>Sage thrasher</b>	<b><i>Oreoscoptes montanus</i></b>
<b>Western burrowing owl</b>	<b><i>Athene cunicularia</i></b>
Western meadowlark	<i>Sturnella neglecta</i>

**Bold** – denotes BLM Sensitive Species

In addition, the Nevada Department of Wildlife (NDOW), Nevada Natural Heritage Program (NNHP), and the United States Fish and Wildlife Service (USFWS) were contacted to request information regarding wildlife use and nesting raptors in the area. In a response letter provided by the NDOW on January 25, 2011 for the proposed Project, the NDOW identified the following migratory birds as being known to reside in the vicinity (three-mile buffer) of the Project Area: American kestrel (*Falco sparverius*); barn owl (*Tyto alba*); western burrowing owl (*Athene cunicularia*); Cooper’s hawk (*Accipiter cooperii*); ferruginous hawk (*Buteo regalis*); golden eagle (*Aquila chrysaetos*); great horned owl (*Bubo virginianus*); long-eared owl (*Asio otus*); merlin (*Falco columbarius*); northern goshawk (*Accipiter gentilis*); northern harrier (*Circus cyaneus*); northern saw-whet owl (*Aegolius acadicus*); osprey (*Pandion haliaetus*); peregrine falcon (*Falco peregrinus*); prairie falcon (*Falco mexicanus*); red-tailed hawk (*Buteo jamaicensis*); rough-legged hawk (*Buteo lagopus*); sharp-shinned hawk (*Accipiter striatus*); short-eared owl (*Asio flammeus*); Swainson’s hawk (*Buteo swainsoni*); turkey vulture (*Cathartes aura*); and western screech-owl (*Megascops kennicottii*). In addition, Cooper’s hawk (*Accipiter cooperii*), and golden eagle have been directly observed within the Project Area. No raptor nest sites have been identified by the NDOW in the vicinity of the Project Area and no known bald eagle or golden eagle nests occur within ten miles of the Project Area beyond the three-mile buffer boundary (NDOW 2011b).

### 3.2.6.2 Environmental Consequences

The Proposed Action would create surface disturbance and associated removal of vegetation, which could potentially result in the destruction of active nests or disturb the breeding behavior of migratory bird species. As outlined in the environmental protection measures in Section 2.1.12, AGC has committed to provide a qualified biologist to conduct nest surveys prior to any surface disturbance activities associated with mining activities during the avian breeding season. This measure would ensure that no direct impacts to migratory birds are likely to occur under the Proposed Action.

Approximately 465.32 acres of migratory bird and raptor habitat would be disturbed over the five-year Project life as a result of implementation of the Proposed Action. Of the 465.32 acres of disturbance proposed, 35.05 acres are currently disturbed by Notice-level exploration activity

and existing facilities and roads. The majority of the new disturbance would occur in areas that have been disturbed by previous operations within the Project Area and have since been reclaimed. Approximately 390.05 acres of the proposed surface disturbance would be at the locations illustrated in Figures 2.1.1 and 2.1.2. Approximately 74.66 acres of proposed disturbance associated with future phases of surface exploration activities could occur anywhere within the Project Area. Vegetation removal, including the reclaimed revegetation that has the potential to support certain species, and ground disturbance would result in a temporary reduction of 465.32 acres of foraging habitat and breeding habitat for migratory birds and foraging habitat for raptors in the Project Area. No raptor nesting habitat has been identified within the Project Area. This acreage would not all be disturbed at one time due to phased exploration and nature of the underground operations.

The Proposed Action would result in a net loss of potential habitat, but would not contribute to a loss of viability for any migratory bird species because most activities would be concentrated near areas already disturbed and extensive similar habitat is available adjacent to the Project Area. It is unlikely that implementing the Proposed Action would result in a decline in local or regional migratory bird populations. In addition, reclamation and revegetation of the surface disturbance associated with the Proposed Action would reduce any loss of habitat.

### **3.2.7 Native American Religious Concerns**

#### **3.2.7.1 Affected Environment**

Located within the traditional territory of the Western Shoshone, the MLFO administrative boundary contains spiritual, traditional, and cultural resources, and sites to engage in social practices that aid in maintaining and strengthening the social, cultural, and spiritual integrity of the Tribes. Recognized Tribes with known interests near the Project Area are: Te-Moak Tribe of Western Shoshone, the Battle Mountain Band Council of the Te-Moak Tribe of Western Shoshone, Duckwater Shoshone Tribe, and the Yomba Shoshone Tribe. In addition, various other community members and individuals are known to have interests in the general area of the Fish Creek Mountains.

Social activities of Native Americans continue to define places of cultural importance across lands currently administered by the BLM. . Some Western Shoshone maintain cultural, spiritual, and traditional activities, visit their sacred sites, hunt game, and gather available medicinal and edible plants. Through oral history (the practice of handing down knowledge from the elders to the younger generations), some Western Shoshone continue to maintain a world view similar to that of their ancestors.

Cultural, traditional, and spiritual sites and activities of importance to Tribes include, but are not limited to the following:

- Existing animal traps;
- Certain mountain tops used for vision questing and prayer;
- Medicinal and edible plant gathering locations;
- Prehistoric and historic village sites and gravesites;
- Sites associated with creation stories;
- Hot and cold springs;

- Collection of materials used for basketry and cradle board making;
- Locations of stone tools such as points and grinding stones (mono and matate);
- Chert and obsidian quarries;
- Hunting sites;
- Sweat lodge locations;
- Locations of pine nut ceremonies, traditional gathering, and camping;
- Rock collecting for use in offerings and medicine gathering;
- Tribally identified Traditional Cultural Properties (TCPs);
- TCPs found eligible to the NRHP;
- Rock shelters;
- Rock art locations;
- Lands or resources that are near, within, or bordering current reservation boundaries; and
- Actions that conflict with tribal land acquisition efforts.

In accordance with the National Historic Preservation Act of 1966 (Public Law (P.L.) 89-665), the NEPA, the FLPMA (P.L. 94-579), the American Indian Religious Freedom Act of 1978 (P.L. 95-341), the Native American Graves Protection and Repatriation Act (NAGPRA) (P.L. 101-601) and EO 13007, the BLM must provide affected Tribes an opportunity to comment and consult on the proposed Project. The BLM must attempt to limit, reduce, or possibly eliminate any negative impacts to Native American traditional/cultural/spiritual sites, activities, and resources.

On March 31, 2011, consultation initiation/invitation letters were mailed for the Project from the BLM MLFO Battle Mountain District Office to the following: Te-Moak Tribe of Western Shoshone; Battle Mountain Band Council of the Te-Moak Tribe of Western Shoshone; Yomba Shoshone Tribe; and Duckwater Shoshone Tribe. A site visit was conducted on June 16, 2011 with the Duckwater Tribe. On August 24, 2012, the BLM notified the same Tribes of the operator change from Victoria to AGC. At the time this EA was prepared, no issues have been identified, but the BLM continues to provide opportunities for participation and input.

### 3.2.7.2 Environmental Consequences

Various Tribes and bands of the Western Shoshone have stated that federal projects and land actions can have widespread effects to their culture and religion as they consider the landscape as sacred and as a provider. Various locations throughout the BLM MLFO Battle Mountain administrative area host certain traditional, spiritual, and cultural use activities today, as in the past. TCPs, designated by the Tribes, are not known to exist within the vicinity of the Project Area. The BLM continues to solicit input from local tribal entities.

For this Proposed Action, the BLM has committed to avoiding those eligible and unevaluated archaeological sites discovered and documented during cultural resources inventories. The BLM is continuing to coordinate with the Tribes to identify any other sites or artifacts, or cultural, traditional, and spiritual use resources and activities that might experience an impact.

If any TCPs, tribal resources, sacred sites, etc. are identified within or in close proximity to the Project boundary, a protective “buffer zone” may be acceptable, if doing so satisfies the needs of the BLM, the proponent, and affected Tribe. The size of any “buffer zone” would be determined through coordination and communication between all participating entities.

The BLM Cultural Resource Specialists, accompanied by designated tribal observers, may periodically visit identified cultural resources sites within or near the mining activity boundary. Native American Consultation and monitoring by the BLM and Tribal Cultural Resource Specialists may occur throughout the life of a project to ensure that any identified traditional cultural properties are not deteriorating.

If a subsequent development plan or amendment to the Plan is submitted to the BLM, as a result of an approval of this specific mining proposal, the BLM would again initiate consultation with the local Tribes and utilize any data collected during this mining proposal.

During the Project's activities, if any cultural properties, items, or artifacts (i.e., stone tools, projectile points, etc.) are encountered, it must be stressed to those involved in the proposed Project activities that such items are not to be collected. The environmental protection measure in Section 2.1.12 states that all activities would be halted immediately in the event of a discovery of a cultural resource. Cultural and archaeological resources are protected under the Archaeological Resources Protection Act (16 United States Code [USC] 470ii) and the FLPMA.

Though the possibility of disturbing Native American gravesites within most project areas is extremely low, inadvertent discovery procedures must be noted. Under the NAGPRA, section (3)(d)(1), the discovering individual must notify the authorized officer in writing of such a discovery. If the discovery occurs in connection with an authorized use, the activity, which caused the discovery, is to cease and the materials are to be protected until the land manager can respond to the situation.

At this time, no impacts related to Native American Religious Concerns have been identified and are not anticipated from the Proposed Action; therefore, Native American Religious Concerns is not further analyzed in this EA.

### **3.2.8 Noxious Weeds, Invasive, and Non-native Species**

#### **3.2.8.1 Affected Environment**

The BLM defines a noxious weed as, “a plant that interferes with management objectives for a given area of land at a given point in time.” The Battle Mountain District MLFO recognizes the current noxious weed list designated by the State of Nevada Department of Agriculture (NDOA) statute, found at [http://agri.nv.gov/nwac/PLANT\\_No WeedList.htm](http://agri.nv.gov/nwac/PLANT_No WeedList.htm). An invasive species is defined as a non-native or alien plant or animal that has entered into an ecosystem. Invasive species are likely to cause economic harm or harm to human health (EO 13112). Noxious weeds, invasive and non-native species are highly competitive, aggressive and easily spread. The Battle Mountain District has developed an Integrated Weed Management Plan for the entire Battle Mountain District. In addition, the BLM follows all Federal Noxious and Invasive Weed Laws, EO 11312 (Prevention and Control of Invasive Species) and various BLM Manuals and NRS and NAC Chapter 555.

In 1997, the *Cooperative Agreement for Noxious Weed Management in Lander County* was developed, which recognized the existence and threat of noxious weeds in Lander County, as well as served as an agreement to work together and share information. The agreement involved

the Nevada Department of Transportation (NDOT), the NDOA, the Battle Mountain and Elko districts of the BLM, the U.S. Forest Service, the University of Nevada Cooperative Extension, Lander County, and the Lander County Conservation District.

According to the baseline report prepared for the Project (GBE 2010), two noxious weeds are known to occur in the vicinity of the Project Area: tamarisk (*Tamarix ramisissima*) and hoary cress (*Cardaria draba*). Tamarisk is common in the Lower Reese River Valley, occurs in Battle Mountain near the Phoenix Mine, and in the drainages extending from the Fish Creek Mountains to the Reese River. This species was present during the McCoy-Cove active mine operations, but has been controlled since that period via Newmont's active noxious weed control program. Hoary cress is present near the former Newmont leach pad in the Project Area, but is also being controlled and managed under Newmont's weed control program.

Invasive, nonnative species observed in the reclaimed and disturbed portions of the Project Area include cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), and Russian thistle (*Salsoa tragus*).

### 3.2.8.2 Environmental Consequences

New surface disturbance within the Project Area as a result of the implementation of the Proposed Action could increase the potential for the spread and establishment of noxious weeds, invasive and nonnative species. New surface disturbance from the Proposed Action would increase the potential for and promote the spread and establishment of noxious weeds, invasive and nonnative species. These impacts would be mitigated based on implementation of the environmental protection measures outlined in Section 2.1.12. In addition, should a new population of noxious weeds be detected, AGC would coordinate with the BLM on eradication methods. No impacts related to noxious are anticipated to result from the Proposed; therefore, noxious weeds, invasive, and nonnative species are not further analyzed in this EA.

## 3.2.9 **Paleontological Resources**

### 3.2.9.1 Affected Environment

The BLM manages paleontological resources under a number of federal laws including the following: FLPMA Sections 310 and 302(b), which direct the BLM to manage public lands to protect the quality of scientific and other values; 43 CFR 8365.1-5, which prohibits the willful disturbance, removal, and destruction of scientific resources or natural objects; 43 CFR 3622, which regulates the amount of petrified wood that can be collected for personal, noncommercial purposes without a permit; and 43 CFR 3809.420 (b)(8), which stipulates that a mining operator "shall not knowingly disturb, alter, injure, or destroy any scientifically important paleontological remains or any historical or archaeological site, structure, building or object on Federal lands."

The Smelser Pass Member of the August Mountain Formation contains invertebrate fossils brachiopods, pelecypods, gastropods, and ammonites. The Home Station Member of the Augusta Mountain Formation contains scattered brachiopod fossils. The sandy bioclastic unit at the base of the Favret Formation contains brachiopod fossils. Based on the limited literature review of the geologic setting of Project Area, significant vertebrate fossils are not abundant within the

geological formations noted to be present. Further, the Project Area has been mined and explored and no paleontological resources were encountered during previous operations and the same conditions are expected with the proposed underground mining activities. In addition, the rocks have been hydrothermally altered within the Project Area. This alteration has destroyed any evidence of fossils.

### 3.2.9.2 Environmental Consequences

Based on the literature review of the geologic setting of Project Area, significant vertebrate fossils are not abundant within the geological formations noted to be present and were not encountered during previous operations (Emmons and Eng 1995; GBE 2010; Kuyper et al. 1991). Additionally, there would be limited potential for preserved paleontological resources due to the hydrothermal alteration evident in the Project Area. As outlined in Section 2.1.12, AGC would not knowingly disturb, alter, injure, or destroy any scientifically important paleontological deposits. If AGC discovers any paleontological resource that might be altered or destroyed by operations, the discovery would be left intact and reported to the authorized BLM officer. This measure would ensure that any undiscovered significant paleontological resource would be left intact, and that the implementation of the Proposed Action would not result in significant impacts to paleontological resources. Therefore, paleontological resources are not further analyzed in this EA.

## 3.2.10 **Rangeland Management**

### 3.2.10.1 Affected Environment

The Project Area is located entirely within the Filippini Ranching Company Use Area of the Carico Lake Grazing Allotment. Filippini Ranching Company is permitted to graze cattle in that allotment from March 1 to April 30 for a total of 777 Animal Unit Months (AUMs). The Project Area is currently fenced and AUMs have been previously suspended from the grazing permit. Further, the Project Area consists of an open pit mine and reclaimed areas that would not provide livestock forage in its current condition.

### 3.2.10.2 Environmental Consequences

No loss of AUMs would result from the Proposed Action and no rangeland resources would be disturbed. Therefore, the Proposed Action would not result in any impacts to livestock grazing or rangeland management and this resource is not analyzed further in this EA.

## 3.2.11 **Social Values and Economics**

### 3.2.11.1 Affected Environment

The Project Area is located in Lander County approximately 26 miles south of the town of Battle Mountain, Nevada. Lander County is located in north central Nevada and encompasses approximately 5,621 square miles. Lander County is the analysis area for Social Values and Economics. The federal government administers over 85 percent of the land in the County. Interstate 80 (I-80) traverses the county in an east-west direction on the northern end, as does

Highway 50 on the southern end. The Project Area is accessed off of I-80 near the Town of Battle Mountain then off State Route 305.

Surface exploration and mining activities associated with the Proposed Action would continue until approximately 2018. The Proposed Action is anticipated to employ up to 37 people over the life of the Project with up to 27 people working at the site during surface exploration and surface facility construction. The individuals involved with the Project could impact the local community in the following ways: impacts to the labor force and unemployment rates; impacts to personal income; impacts to population; impacts to housing; impacts to community facilities and services, including public safety, schools, health care and social services, utilities, recreational facilities, and county administrative functions; and Lander County fiscal conditions. The existing conditions within Lander County are discussed below.

### 3.2.11.1.1 Population and Demography

Population in Lander County has fluctuated between 2002 and 2011, increasing overall by 441 persons or approximately eight percent. Lander County saw two decreases in population during that timeframe between 2002 and 2003 and between 2009 and 2010. The largest decrease was between 2002 and 2003 with a loss of 270 persons, or approximately five percent of the population (Table 3.2-8).

**Table 3.2-8: Lander County Population, 2002-2011**

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
5,547	5,277	5,357	5,509	5,655	5,747	5,891	6,003	5,775	5,988

Source: Nevada State Demographer's Office (NSDO) 2011

At the time of the 2010 decennial census, approximately 91 percent of Lander County's residents (5,247) lived in Battle Mountain. The median age of Lander County's residents was 37.1 compared to 36.3 for the State of Nevada. Residents 15 to 19 years of age comprised the single largest group reported by the Census Bureau, with 453 residents, and made up approximately 7.8 percent of Lander County's population (U.S. Census Bureau 2012). Children under 18 years of age represented approximately 30 percent of Eureka County's population, higher than the State of Nevada with 24.6 percent. Seniors aged 65 and over comprised approximately 11.8 percent of the County's population, similar to 12 percent of the State of Nevada's overall population. The average household size in Lander County was 2.6, slightly below the statewide average of 2.65.

The racial composition of Lander County's population is more predominately white than that of the State of Nevada as a whole. In 2010, 86.3 percent of Lander County residents identified themselves as white, alone or in combination with one or more other races, which compares to 70 percent at the statewide level.

### 3.2.11.1.2 Economy and Employment

The majority of employment in Lander County is related to farming, mining, construction, retail, and government jobs. Between 1990 and 2010, the total employment remained relatively constant in Lander County (Table 3.2-9), increasing approximately 16 percent between 1990 and

2010. Lander County did experience a drop in employment between 1990 and 1995, and between 1995 and 2000; however, the total employment saw steady growth each year starting in 2005.

**Table 3.2-9: Lander County Employment Trends**

Year	Farm	Mining	Other Private	Government	Total
1990	139	1,428	1,244	477	3,288
1995	136	1,141	1,416	519	3,212
2000	172	883	1,208	573	2,836
2005	146	1,077	1,376	534	3,133
2006	141	1,110	1,356	534	3,141
2007	130	1,227	1,425	532	3,314
2008	132	1,368	1,471	552	3,523
2009	129	1,549	1,496	562	3,736
2010	132	1,682	1,435	562	3,811

Source: U.S. Department of Commerce Bureau of Economic Analysis (USDC BEA) 2012a; USDC BEA 2012b

Labor force and employment statistics for 2006 to 2012 for Lander County and the State of Nevada are presented in Table 3.2-10. The resident labor force in Lander County is limited based on the small population base. However, as the economic downturn occurred in the rest of nation in 2008, the total labor force and employment in Lander County continued to increase as shown in 2006 and 2007. Between 2006 and 2012, total employment in Lander County grew by approximately 64 percent. The unemployment rates did increase in 2009 and 2010, but reduced back down to less than 2009 levels. This pattern did not reflect the pattern in the entire State of Nevada, as the unemployment rate in the State of Nevada increased by approximately 87 percent between 2008 and 2009, slowly increased in 2010 and 2011, and then only reduced 1.4 percent in 2012.

**Table 3.2-10: Lander County Labor Force and Unemployment Rates, 2006 to 2012**

Labor Force	2006	2007	2008	2009	2010	2011	2012
<b>Lander County</b>							
Total Labor Force	2,752	3,323	3,603	4,053	4,276	4,458	4,521
Employment	2,640	3,211	3,439	3,810	3,973	4,165	4,264
Unemployment	112	112	164	243	303	293	257
Unemployment Rate (percent)	4.5	3.4	4.6	6.0	7.1	6.6	5.7
<b>State of Nevada</b>							
Total Labor Force	1,276,387	1,307,321	1,336,309	1,354,126	1,385,729	1,385,872	1,366,99
Employment	1,222,277	1,247,491	1,246,696	1,184,431	1,195,309	1,198,140	1,201,277
Unemployment	54,110	59,830	89,613	169,695	190,420	187,732	165,022
Unemployment Rate	4.2	4.6	6.7	12.5	13.7	13.5	12.1

Source: Nevada Department of Employment, Training, and Rehabilitation (NDETR) 2012

Local personal income trends in Lander County are shown in Table 3.2-11. Personal earnings showed a slight decrease from 2006 to 2007 then showed steady increases from 2007 to 2010.

This increase went against the national trend and economic downturn in 2008. The adjustment for residence value is reflected as negative numbers, as most of the labor earnings flow out of Lander County and the local economy, as a majority of workers commute into Lander County for work from other areas. In 2010, a net outflow of \$34,082 occurred, equivalent to approximately 14 percent of the total wages and salaries paid in Lander County.

**Table 3.2-11: Lander County Personal Income and Place of Residence, 2006-2010**

Description	2006	2007	2008	2009	2010
Earnings by Place of Work	\$175,851	\$171,600	\$201,652	\$227,385	\$245,282
Less: contributions for government social insurance	\$16,972	\$16,825	\$19,064	\$22,914	\$25,015
Plus: adjustment for residence	-\$17,402	-\$14,415	-\$23,304	-\$32,694	-\$34,082
Equals: net earnings by place of residence	\$141,477	\$140,360	\$159,284	\$171,777	\$186,185
Plus: dividends, interest, and rent	\$20,872	\$23,526	\$28,542	\$24,140	\$24,723
Plus: personal current transfer receipts	\$21,546	\$23,428	\$25,868	\$29,941	\$31,299

Source: USDC BEA 2012c

Lander County's per capita personal income was less than the State of Nevada and the nationwide income between 2006 and 2008 (Table 3.2-12). Following the nationwide economic downturn in 2008, the per capita income in Lander County was greater than the State of Nevada as a whole in 2009 and 2010, which reflected the higher than average wages and salaries paid by the mining industry. Lander County's per capita income was relatively similar to the nationwide per capita income for 2009.

**Table 3.2-12: Per Capita Personal Income, 2006-2010**

Jurisdiction	2006	2007	2008	2009	2010
Lander County	\$34,651	\$34,439	\$38,706	\$39,904	\$41,818
Nevada	\$38,786	\$39,872	\$39,879	\$36,533	\$36,938
United States	\$37,725	\$39,506	\$40,947	\$38,846	\$39,937

Source: USDC BEA 2012c

### 3.2.11.1.3 Housing

According to the 2010 U.S. Census, there were 2,575 housing units in Lander County, in which 2,213 units were occupied and 362 were vacant. There were 100 units available to be rented and 42 units available to be purchased (U.S. Census Bureau 2010). As discussed in the 2010 Lander County Master Plan, the majority of housing units were mobile homes and only a small portion were single-family detached structures (Lander County 2010).

In addition to the permanent residences, there are temporary residences throughout the County, which include motels, recreational vehicle (RV) parks, and campgrounds. There are three motels in Austin with a combined total of 39 rooms, two bed and breakfast facilities, and two RV parks

(Austin, Nevada 2012). There are three hotels in Battle Mountain and two RV parks (Battle Mountain Chamber 2012). There is also one bed and breakfast in the community of Kingston (Nevada Bed & Breakfast Guild 2010).

#### 3.2.11.1.4 Community Facilities and Services

##### Public Safety

The Lander County Sheriff's Office (LCSO) provides law enforcement services for Lander County. There are two patrol areas within Lander County including the northern patrol area which serves out of the Battle Mountain headquarters, and the southern patrol area which serves out of the Austin station. The LCSO provides administration, patrol, jail, dispatch, and animal control services in the county (LCSO 2006).

Fire protection services on private land in Lander County are provided by three local volunteer fire departments (VFDs) located in Battle Mountain, Austin, and Kingston. There are approximately 25 fire fighters in Battle Mountain, between eight and 11 in Austin, and approximately seven in Kingston. Each VFD has at least three pieces of mobile fire fighting vehicles (Lander County 2010). Fire protection services on public land are primarily the responsibility of the BLM and Nevada Division of Forestry.

Emergency medical services and transportation in Lander County are provided by the Battle Mountain Ambulance Department and the Austin Volunteer Ambulance Department. The Battle Mountain Ambulance Department has 11 Emergency Medical Technicians (EMTs) and two ambulance units, and the Austin Volunteer Ambulance Department has one EMT (Lander County 2010).

##### Public Education

Public education in Lander County is provided by the Lander County School District (LCSD). There are five schools in Lander County; one is located in Austin and four are located in Battle Mountain. Austin K-12 School located in Austin had a student enrollment of approximately 35 students for the 2011/2012 school year. Battle Mountain Elementary School located in Battle Mountain had a student enrollment of approximately 329 students, Eleanor Lemaire Elementary School in Battle Mountain had a student enrollment of approximately 230 students, Battle Mountain Junior High School had a student enrollment of approximately 144 students, and Battle Mountain High School had a student enrollment of approximately 368 students (Nevada Department of Education [NDE] 2011). Student enrollment remained relatively constant in Lander County between the 2003/2004 school year and the 2007/2008 school year (Table 3.2-13). The LCSD saw a decrease in student enrollment each year between the 2007/2008 school year and the 2011/2012 school year.

**Table 3.2-13: Lander County School District Enrollment**

Grade	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
Pre- Kindergarten - 6	635	604	638	612	620	588	507	569	579
7-12	612	622	650	646	653	605	624	546	527
<b>Total</b>	<b>1,247</b>	<b>1,226</b>	<b>1,288</b>	<b>1,258</b>	<b>1,273</b>	<b>1,193</b>	<b>1,131</b>	<b>1,115</b>	<b>1,106</b>

Source: NDE 2003; NDE 2004; NDE 2005; NDE 2006; NDE 2007; NDE 2008; NDE 2009; NDE 2010; NDE 2011

### Health Care

Health care in Lander County is provided from two medical clinics. One clinic is located in Battle Mountain and the other clinic is located in Austin. There is also a community health nurse located in Battle Mountain. Battle Mountain General Hospital provides emergency services, clinical laboratory services, and x-ray services, and includes a large day room for long-term care (Lander County 2012; Battle Mountain General Hospital 2012).

### Utilities

#### *Water Service*

Municipal water service in Lander County is provided by three water systems including the Battle Mountain Water System – Lander County Sewer and Water District #1 (District #1), the Austin Water System – Lander County Sewer and Water District #2 (District #2), and the Kingston Water System. The District #1 water system serves approximately 200 residential customers and a few small commercial customers. This system includes three main ground water wells located in Battle Mountain, with the largest and main production well producing up to 2,000 gpm, and the other two wells producing up to 1,000 gpm. Water is pumped into two storage tanks with a combined storage capacity of 2.3 million gallons (Lander County 2010).

The District #2 water system serves approximately 126 residential and 40 commercial customers. The current capacity of this system including two underground water wells and springs is up to 700 gpm. The total water storage capacity includes three above ground storage tanks and two underground storage tanks for a total capacity of 500,000 gallons (Lander County 2010).

The Kingston water system serves approximately 144 customers, which includes primarily residential customers and a few commercial customers. The water originates from two wells that produce a combined total of approximately 350 gpm. Water is stored in one storage tank with a capacity of 225,000 gallons (Lander County 2010).

#### *Wastewater Service*

Municipal wastewater service is provided only in the communities of Battle Mountain and Austin. The remaining rural areas in Lander County are served by septic systems. The sewer system in Battle Mountain includes the following: 19,500 linear feet of vitrified clay pipe; 5,500 linear feet of asbestos cement pipe; and a sewer plant currently treating approximately 0.8 million gallons per day. The domestic wastewater facility in Austin is capable of treating

approximately 240,000 gallons per day. This facility serves approximately 166 residential and commercial connections (Lander County 2010).

### *Electricity*

NV Energy provides the majority of Lander County's electrical service. The eastern portion of Lander County is primarily undeveloped, so does not have electrical services provided in the area that is adjacent to Eureka County.

### Library

Lander County is part of the Elko-Lander-Eureka County library system. There are two libraries in Lander County located in Austin and Battle Mountain. The library in Austin is open three days per week, approximately four hours per day. The library in Battle Mountain is open six days a week (Elko-Lander-Eureka County Library System 2012a and 2012b).

### Recreation Facilities

Lander County provides many recreational opportunities for its residents. The urban-focused recreational activities are located in the communities of Battle Mountain, Austin, and Kingston. Within the Town of Battle Mountain there are the following types of recreational facilities: a nine hole golf course with driving range; a race track and motocross course; a shooting range; a rodeo arena and grounds; Elquist Park including high school ballfields and a swimming pool; adult ballfields; a sports complex at LeMaire School including baseball and soccer fields, a skate park, and two tennis courts; and three neighborhood parks. The community of Austin includes a roping arena, swimming pool, a community park, tennis courts, an outside exercise circuit, and a youth center. There is a park and ballfield and fishing pond in the community of Kingston (Lander County 2010).

#### 3.2.11.1.5 Public Finance

The primary governing bodies in Lander County are the Lander County Commissioners and the LCSD. The five-member Lander County Commission is each elected to an overlapping four-year term. The County Commissioners oversee County operations, including administration, law enforcement, judicial, public works, and economic development. The LCSD serves Lander County and is governed by an elected board of trustees, with the superintendant and administration responsible for day-to-day operations.

Local government and school finances in Nevada involved locally derived and state-shared revenues. Locally derived finances consist primarily of ad valorem property taxes on real and personal property and the net proceeds of mines located within Lander County. The state-shared revenues include sales, motor vehicle, fuel, and gaming tax revenues. Current fiscal conditions of the two primary entities, Lander County and the LCSD, are summarized below.

Lander County

Lander County’s fiscal structure reflects a heavy dependence on ad valorem taxes. Lander County’s assessed valuation saw a steady increase between fiscal years 2002/2003 to 2005/2006. The assessed valuation declined by approximately \$44 million (approximately 13 percent) between fiscal years 2005/2006 to 2006/2007, and again between 2007/2008 to 2008/2009 by approximately \$30 million (approximately nine percent). There was a large increase between fiscal years 2009/2010 and 2010/2011 of approximately \$800 million (approximately 190 percent), and another substantial increase between fiscal years 2010/2011 and 2011/2012 of approximately \$860 million (approximately 70 percent) in line with the increasing value of gold prices. Table 3.2-14 summarizes the net proceeds generated in the County.

**Table 3.2-14: Trends in Net Proceeds and Property Assessments**

Fiscal Year	Net Proceeds from Mining	Real and Personal Property Assessments	Total Taxable Value
2002/2003	\$140,000,000	\$191,470,130	\$331,470,130
2003/2004	\$150,000,000	\$177,452,411	\$327,452,411
2004/2005	\$165,000,000	\$165,892,259	\$330,892,259
2005/2006	\$175,000,000	\$166,607,546	\$341,607,546
2006/2007	\$28,800,000	\$268,828,588	\$297,628,588
2007/2008	\$80,000,000	\$265,990,214	\$345,990,214
2008/2009	\$30,000,000	\$286,119,956	\$316,119,956
2009/2010	\$86,202,418	\$336,175,994	\$422,378,412
2010/2011	\$874,231,080	\$351,271,987	\$1,225,503,067
2011/2012	\$1,724,362,256	\$364,420,737	\$2,088,782,993

Source: Division of Assessment Standards (DOAS) 2002; DOAS 2003; DOAS 2004; DOAS 2005; DOAS 2006; DOAS 2007; DOAS 2008; DOAS 2009; DOAS 2010; DOAS 2011

The volatility in taxable value carries over to ad valorem tax revenues. Ad valorem taxes levied on that tax base by Lander County increased by approximately \$5.6 million between fiscal years 2009/2010 and 2010/2011 (Table 3.2-15). Other locally derived revenues declined between fiscal years 2009/2010 and 2010/2011 by approximately seven percent.

Intergovernmental revenues account for most of Lander County’s remaining revenues. Unlike the increase of ad valorem taxes between fiscal years 2009/2010 and 2010/2011, the intergovernmental revenues declined by \$270,710.00 (Table 3.2-15). Intergovernmental revenues include federal and state grants, motor vehicle property taxes, and fuel taxes.

**Table 3.2-15: Lander County Revenues for Fiscal Years 2009/2010 and 2010/2011**

Types of Revenue	Fiscal Years	
	2009/2010	2010/2011
Taxes (property and other)	\$7,915,486	\$13,537,045
Licenses and Permits	\$489,640	\$273,325
Intergovernmental	\$4,124,919	\$3,854,209
Charges for Services	\$658,130	\$702,226
Fines and Forfeits	\$280,495	\$300,429
Earnings on investments	\$63,255	\$67,228
Miscellaneous	\$95,580	\$94,850

Types of Revenue	Fiscal Years	
	2009/2010	2010/2011
<b>Total Revenue</b>	<b>\$13,627,505</b>	<b>\$18,829,312</b>

Source: Lander County Finance Department 2010 and 2011

The overlapping ad valorem tax rates of all entities imposed on property in the town of Battle Mountain is \$0.05 per \$100 of assessed valuation (Table 3.2-16). This is approximately one percent of the state-mandated maximum of \$3.64. Lander County’s levy is \$1.9243, approximately 50 percent of the total. LCSD’s levy is \$0.75, a uniform statewide levy for public education. Other levies include the following: \$0.2213 for the town of Austin; \$0.3048 for the town of Kingston; \$0.5109 for the Lander County Hospital District; and \$0.0677 for the Lander County Sewer & Water District #2.

**Table 3.2-16: Tax Rates in Lander County for 2011/2012**

Taxing Entity	Tax Rate
Lander County	\$1.9243
Lander County School District	\$0.7500
Austin Town	\$0.2213
Battle Mountain Town	\$0.0500
Kingston Town	\$0.3048
Lander County Convention & Tourism Authority	--
Lander County Hospital District	\$0.5109
Lander County Sewer & Water District #2	\$0.0677
<b>Total</b>	<b>\$3.8290</b>

Source: DOAS 2011

Lander County total expenditures decreased by \$482,032 between fiscal years 2009/2010 and 2010/2011, or by approximately five percent. Expenditures for general government, judicial, and intergovernmental functions also decreased between fiscal years 2009/2010 and 2010/2011 (Table 3.2-17). Expenditures for public safety increased by \$321,694 or by approximately four percent.

**Table 3.2-17: Lander County Budgeted Expenditures for Fiscal Years 2009/2010 and 2010/2011**

Function/Department	Fiscal Years	
	2009/2010	2010/2011
General Government	\$3,232,449	\$2,971,490
Judicial	\$1,589,534	\$1,584,495
Public Safety	\$3,075,129	\$3,396,823
Intergovernmental	\$922,302	\$384,574
<b>Total Expenditures</b>	<b>\$8,819,414</b>	<b>\$8,337,382</b>

Source: Lander County Finance Department 2010 and 2011

### 3.2.11.2 Environmental Consequences

Surface exploration and mining activities associated with the Proposed Action would continue until approximately 2018. The Proposed Action is anticipated to employ up to 37 people over the life of the Project with a maximum of 27 people working at any given time (during surface

exploration and surface facility construction). Employees would consist of contractors that would stay primarily in Battle Mountain. Impacts may occur to public services, including public safety, schools, and health care, as well as recreational facilities. However, based on the small number of employees and the five-year Project life, these impacts are considered minimal and temporary. In addition, Project employees would contribute to the local economy by the purchase of goods and services.

### 3.2.12 Soils

#### 3.2.12.1 Affected Environment

The Project Area is located within the Humboldt Area Major Land Resource Area (MLRA) (NRCS 2011). The Humboldt Area MLRA is in the Great Basin Section of the Basin and Range geologic province. This area is dominated by a series of widely spaced north-south trending mountain ranges that are separated by wide valleys filled with alluvium and lacustrine materials (NRCS 2011). Locally, the western side of the Project Area lies on the northeastern side of the Fish Creek Mountains, and the eastern side of the Project Area is located in the Lower Reese River Valley. The Lower Reese River Valley is a broad north-south trending valley draining to the north into the Humboldt River.

The eleven soil associations identified within the Project Area from the Natural Resource Conservation Service (NRCS) database are listed in Table 3.2-18. However, all of the area proposed for Project disturbance has been previously disturbed. Therefore, the soils have been previously salvaged and used in reclamation of the past mine facilities. Consequently, the soil associations and descriptions do not apply to the site as it currently exists. Prior to disturbance, the soil types in the Project Area are typical of those found throughout this portion of northern Nevada, and consist largely of very gravelly to very fine sandy loams. These soils can be strongly alkaline and are best suited for salt desert scrub vegetation when they have been salvaged and redistributed for reclamation (GBE 2010).

**Table 3.2-18: Pre-Mining and Reclamation Soil Series within the Project Area**

Association	Soil Series	Range in Depth to Restrictive Surface	Landscape position/ % Slope	Profile Soil Texture	Permeability	Erosion Hazard by Water	Erosion Hazard by Wind
Kingingham-Golconda-Whirlo (1292)	Kingingham	20 to 30 inches (hardpan)	Upper summits, shoulders, and side slopes of fan piedmont remnants 2 to 8%	Very fine sandy loam	Slow	Slight	Slight
	Golconda	20 to 40 inches (hardpan)	Lower summits and side slopes of fan piedmont remnants; 2 to 8%	Gravelly very fine sandy loam	Slow	Slight	Slight

Association	Soil Series	Range in Depth to Restrictive Surface	Landscape position/ % Slope	Profile Soil Texture	Permeability	Erosion Hazard by Water	Erosion Hazard by Wind
	Whirlo	> 60 (seasonal high water table)	Inset fans and fan aprons; 2 to 8%	Gravelly very fine sandy loam	Moderately rapid	Slight	Slight
Oxcorel-Beoska-Whirlo (2060)	Oxcorel	> 60 (seasonal high water table)	Upper summits of fan piedmont remnants; 2 to 8%	Very fine sandy loam	Very slow to moderately rapid	Slight	Slight
	Beoska	> 60 (seasonal high water table)	Lower summits of fan piedmont remnants; 0 to 4%	Silt loam	Moderately slow to moderately rapid	Slight	Slight
	Whirlo	> 60 (seasonal high water table)	Inset fans and fan aprons; 2 to 8%	Gravelly very fine sandy loam	Moderately rapid	Slight	Slight
Koynik, steep Koynik-Rock outcrop (1400)	Koynik	8 to 14 (bedrock)	Crests and shoulder slopes of low mountains and foothills; 15 to 30%	Very gravelly very fine sandy loam	Moderate	Moderate	Slight
	Koynik, steep	8 to 14 (bedrock)	Side slopes of lower mountains and foothills; 30 to 50%	Very cobbly very fine sandy loam	Moderate	Severe	Slight
	Rock outcrop	NA	Multiple ledges and locally exposed broad bedding planes on low mountains and foothills; 15%	NA	NA	NA	NA
Bojo-Rock outcrop-Osoll (1411)	Bojo	7 to 14 (bedrock)	Side slopes of foothills; 15 to 75%	Gravelly sandy loam	Moderately slow	Severe	Slight
	Rock outcrop	NA	Steep cliffs on upper side slopes of foothills; 20%	NA	NA	NA	NA

Association	Soil Series	Range in Depth to Restrictive Surface	Landscape position/ % Slope	Profile Soil Texture	Permeability	Erosion Hazard by Water	Erosion Hazard by Wind
	Osoll	8 to 14 (hardpan)	Predominantly south- and west-facing, lower, colluvial side slopes of foothills; 15 to 30%	Gravelly loam	Moderately rapid	Severe	Slight
Bojo-Stingdorn (1410)	Bojo	7 to 14 (bedrock)	Side slopes of foothills; 15 to 75%	Gravelly sandy loam	Moderately slow	Severe	Slight
	Stingdorn	8 to 20 Inches (hardpan)	Broad, stable crests and lower elevation side slopes of foothills; 4 to 15%	Gravelly loam	Moderately slow	Slight	Slight
Broyles very fine sandy loam (230)	Broyles	> 60 (seasonal high water table)	Fan skirts; 0 to 2%	Very fine sandy loam	Moderately rapid	Slight	Slight
Cren silt loam (300)	Cren	> 60 (seasonal high water table)	Fan skirts; 0 to 2%	Silt loam	Moderate	Slight	Slight
Whirlo-Broyles (1169)	Whirlo	> 60 (seasonal high water table)	Upper fan skirts; 4 to 8%	Gravelly very fine sandy loam	Moderately rapid	Slight	Slight
	Broyles	> 60 (seasonal high water table)	Lower fan skirts and inset fans; 2 to 4%	Very fine sandy loam	Moderately rapid	Slight	Slight
Kingingham-Oxcorel (1293)	Kingingham	20 to 30 inches (hardpan)	Upper summits of fan piedmont remnants; 2 to 8%	Gravelly very fine sandy loam	Slow	Slight	Slight
	Oxcorel	> 60 (seasonal high water table)	Lower summits of fan piedmont remnants; 2 to 8%	Gravelly fine sandy loam	Very slow to moderately rapid	Slight	Slight

Association	Soil Series	Range in Depth to Restrictive Surface	Landscape position/ % Slope	Profile Soil Texture	Permeability	Erosion Hazard by Water	Erosion Hazard by Wind
Izod-Koynik-Rock outcrop (3690)	Izod	7 to 14 (bedrock)	North- and east-facing side slopes of foothills 15 to 50%	Cobbly loam	Moderate	Severe	Slight
	Koynik	8 to 14 (bedrock)	South-facing side slopes of foothills; 15 to 30%	Very gravelly very fine sandy loam	Moderate	Moderate	Slight
	Rock outcrop	NA	Multiple ledges and locally exposed bedrock along broad bedding planes; 15%	NA	NA	NA	NA
Broyles very fine sandy loam (233)	Broyles	> 60 (seasonal high water table)	Fan skirts; 0 to 2%	Very fine sandy loam	Moderately rapid	Slight	Slight

Source: NRCS 1992  
 Notes: NA = not applicable

*Soils in the RIB System*

This section of the document provides a description of the original soils in the RIB system area as described in HydroGeo, Inc.'s Hydrogeologic and Geochemical Technical Report. The Bojo-Stringdorn association is found on the foothills in the western part of the Project Area. The Bojo soil is mapped on the higher elevation crests and side slopes of the foothills. The Stringdorn soil is located on the lower elevation side slopes. The Bojo soil is about ten inches in depth and overlies the unweathered bedrock. The Stringdorn soil is 15 to 20 inches in depth and overlies indurated duripan, and at approximately 20 inches in depth overlies unweathered bedrock. The permeability of both soils is moderately slow and both soils have a slight hazard of erosion by water and wind when disturbed. The Oxcorel-Geoska-Whirlo association occurs on the alluvial fans, which make up most of the RIB system area. All three of these soils are over 60 inches in depth. At over 34 inches in depth, all three soils have a moderately rapid permeability. The hazard of erosion by water and wind of these soils is slight. The third mapped unit, the Broyles series, is found in the southeastern portion of the Project Area. The Broyles series is a very fine sandy loam and is found on the skirts of the alluvial fans, on slopes of less than two degrees. The soil unit is over 60 inches in depth and overlies bedrock. The permeability of these soils is moderately rapid and, when disturbed, they have a slight hazard of erosion by water and wind. In 1992, Echo Bay conducted basin and percolation soil testing in order to evaluate the percolation characteristics and soil continuity within the phased RIBs system area (Echo Bay 1994). This

now reclaimed area is going to be reused for the Project RIB system. Basin tests (large scale percolation tests) give results similar to what could be expected in a RIB. Basin tests are conducted by excavating basins approximately ten feet long by four feet wide and two to three feet deep. The sides of the excavation are lined with plastic to minimize the effect of horizontal infiltration. Percolation tests are conducted by setting slotted pipe in a 12 inch diameter by 18 inch deep test hole. The test hole is then filled with water and allowed to soak in. Eleven sample locations were located within the RIB area. The soils were generally found to have a sandy texture. Two of the sample locations had a silty texture and one of the locations was clayey. Isolated bands of hardpan caliche were also encountered. Basin test infiltration rates ranged from 7.59 minutes per inch to 45.54 minutes per inch. Percolation test infiltration rates ranged from 1.03 minutes per inch to 8.81 minutes per inch. The variability of the test results reflects the varying soil types within the RIB area (HydroGeo, Inc. 2010).

### 3.2.12.2 Environmental Consequences

Approximately 465.32 acres would be disturbed over the five-year Project life as a result of implementation of the Proposed Action. Of the 465.32 acres of disturbance proposed, 35.05 acres are currently disturbed by Notice-level exploration activity and existing facilities and roads. The majority of the new disturbance would occur in areas that have been disturbed by previous operations within the Project Area and have been reclaimed. Approximately 390.05 acres of the proposed surface disturbance would be at the locations shown in Figures 2.1.1 and 2.1.2. Approximately 74.66 acres of proposed disturbance associated with future phases of surface exploration activities could occur anywhere within the Project Area. The surface exploration disturbance would be created incrementally and would be dispersed throughout the Project Area. The majority of the soils has been previously disturbed and reclaimed and likely do not possess native horizons or characteristics. Soils in the areas subject to surface exploration activities may still exhibit some native components.

Soil erosion potential for other areas of disturbance within the Project Area would also be higher than the natural environment. The construction of sloped facilities, such as the WRDF and stockpiles, would increase the erodibility hazard of soils until the completion of stabilization and revegetation activities during reclamation. However, interim stabilization, including seeding, would be conducted to reduce erosion. The construction of additional features and expansion of existing features, including the yards, haul, access, and exploration roads, pipeline and powerline corridors, sediment control structures, other ancillary facilities, and mineral exploration, would also increase the erosion potential of soils within the Project Area. Final reclamation activities under the Proposed Action would include the stabilization and revegetation of all disturbed areas within the Project Area.

In addition, the potential impacts to the disturbed and reclaimed soils would be reduced by the environmental protection measure outlined in Section 2.1.12 requiring the use of BMPs to limit erosion and to reduce sediment runoff from Project facilities and disturbed areas during construction and operations. Although little topsoil is expected to be present, growth media that represents the top layer of reclaimed soils would be salvaged during Project activities, stored and reused during reclamation activities. For the most part, none of the proposed facilities would become permanent topographical features. Therefore, implementation of the Proposed Action would not be anticipated to result in substantial impacts to soil loss from erosion.

### 3.2.13 Special Status Species

The BLM's policy for management of special status species is in the BLM Manual Section 6840. Special status species include the following:

- Federally Threatened or Endangered Species: Any species that the USFWS has listed as an endangered or threatened species under the Endangered Species Act (ESA) throughout all or a significant portion of its range.
- Proposed Threatened or Endangered Species: Any species that the USFWS has proposed for listing as a federally endangered or threatened species under the ESA.
- Candidate Species: Plant and animal taxa that are under consideration for possible listing as threatened or endangered under the ESA.
- BLM Sensitive Species-2011 List: 1) Species that are currently under status review by the USFWS; 2) Species whose numbers are declining so rapidly that federal listing may become necessary; 3) Species with typically small and widely dispersed populations; or 4) Species that inhabit ecological refugia or other specialized or unique habitats.
- State of Nevada Listed Species: State-protected animals that have been determined to meet BLM's Manual 6840 policy definition.

Nevada BLM policy is to provide State of Nevada listed species and Nevada BLM sensitive species with the same level of protection as are provided to candidate species in BLM Manual 6840.06C. Per the wording in Table IIa in BLM Information Bulletin No. NV-2003-097, Nevada protected animals that meet BLM's 6840 policy definition are those species of animals occurring on BLM-managed lands in Nevada that are: 1) 'protected' under authority of the NAC; 2) have been determined to meet BLM's policy definition of "listing by a state in a category implying potential endangerment or extinction;" and 3) are not already included as federally listed, proposed, or candidate species.

Baseline surveys for biological resources including special status species wildlife and plant species were conducted by Great Basin Ecology (GBE) in 2010 for the Project Area and surrounding area (GBE 2010).

To further support the preparation of this EA, the USFWS, the NNHP, and the NDOW were contacted to obtain a list of threatened and endangered and sensitive species that have the potential to occur within the Project Area. In addition, an additional evaluation of the most recent BLM Sensitive Species List and Special Status Species lists for the Battle Mountain District were evaluated to determine if any new species that had been added to the list subsequent to the baseline biology surveys conducted by GBE had the potential to occur within the Project Area (Enviroscientists, Inc. 2012). The special status wildlife and plant species that have potential to occur with the Project Area are listed in Appendix A and are further discussed below.

### 3.2.13.1 Affected Environment

#### *Federally Listed Species*

The response letter received from the USFWS, dated February 14, 2011, did not identify any federally listed or proposed species with the potential to occur in the Project Area (USFWS 2011). However, they did identify the greater sage-grouse (*Centrocercus urophasianus*) as a candidate species known to occur in the vicinity of Project Area. Greater sage-grouse is discussed further below in the BLM Sensitive Species section.

The NNHP response letter, dated January 25, 2011, reported in a five kilometer radius search surrounding the townships and ranges of the Project Area, that there were no at risk or federally listed species recorded within the Project Area (NNHP 2011).

The NDOW response letter, dated January 25, 2011, stated that there were no federally listed species that are known to occur in the Project Area (NDOW 2011).

GBE's biological surveys of the Project Area did not detect any federally listed or candidate species (GBE 2010).

#### *BLM Sensitive Species*

In addition to federally listed species (i.e., protected by the ESA) discussed above, the BLM also protects special status species by policy (BLM 1988). The list includes certain species designated by the State of Nevada, as well as species designated as "sensitive" by the Nevada BLM State Director. A list of the Battle Mountain BLM Sensitive Species and potential to occur is included in Appendix A. Various BLM sensitive raptor, bird, small mammal, bat, and plant species to have the potential to occur within the Project Area as discussed below.

#### Greater Sage-Grouse

Greater sage-grouse is a candidate for listing under the ESA and on March 23, 2010, the USFWS's 12-month status review of the species determined that the species warrants the protection under the ESA. The listing of the greater sage-grouse at this time is precluded by the need to address higher priority species and the state and BLM are responsible for management of the species.

Greater sage-grouse, an upland game bird, is largely dependent on sagebrush for nesting and brood rearing and feed almost exclusively on sagebrush leaves during the winter. Greater sage-grouse are found in 11 western states and two Canadian provinces. In Nevada, the greater sage-grouse habitat includes sagebrush, montane shrubland, and wet meadow. The greatest threats to the greater sage-grouse in Nevada are loss of habitat due to fire and piñon-juniper encroachment and a decline in habitat quality due to invasive plants and inadequate grazing management systems, which can particularly impact brood-rearing meadows (GBBO 2010). In 2010, the population in Nevada was estimated to be 68,000-88,000, which represented approximately 50 percent of the global population (GBBO 2010). Greater sage-grouse have specific habitat

requirements to carry out their life cycle functions. Sage-grouse breeding habitats are defined as those where lek attendance, nesting, and early brood-rearing occur (Connelly et al 2004).

Early spring habitat or breeding sites called “leks,” are usually situated on ridge tops or grassy areas surrounded by a substantial brush and herbaceous component (Schroeder et al. 1999). In early spring males gather in leks where they strut to attract females. Leks are a traditional courtship display and mating areas attended by sage-grouse in or adjacent to sagebrush dominated nesting habitat (Connelly et al 2004). Leks have less herbaceous and shrub cover than surrounding areas. Spring is a period when birds are changing diets from sagebrush to forbs as forbs become available (Connelly et al 2004).

Sage-grouse nesting habitat is often a broad area within or adjacent to winter range or between winter and summer range (Connelly et al 2004). Late spring habitat or nesting sites are located in thick cover in sagebrush habitat beneath sagebrush or other shrubs. Nests are situated on the ground in a shallow depression with an average distance between nest sites and nearest leks of 0.7 mile to 3.9 miles; however, females may move greater than 12.4 miles from a lek to nest (NatureServe 2010). Selection of specific habitat features, such as sagebrush height and canopy cover within a landscape by nesting sage-grouse has been extensively documented. It is suggested that nesting habitat within sagebrush stands should contain between 15 and 25 percent canopy cover. Females preferentially selected areas with sagebrush 36 to 63.5 centimeters tall and with canopies 15 to 50 percent for nesting in Utah (Connelly et al 2004).

Early brood-rearing habitat is defined as sagebrush habitat within the vicinity of the nest used by sage-grouse hens with chicks up to three weeks following hatch. Early brood rearing habitat may be relatively open with approximately 14 percent canopy cover of sagebrush and abundant forbs, which attract insects to feed young chicks. Denser sagebrush is often on the periphery to provide shelter from predators. Early brood-rearing locations had less live sagebrush (15.8 vs. 20.2 percent) and total shrub (19.3 vs. 24.1 percent) canopy cover, more residual grass (2.9 vs. 2.0 percent), total forb (9.3 vs. 6.6 percent), and total herbaceous (37.3 vs. 29.4 percent) cover, relative to available habitats (Connelly et al 2004). Late brood-rearing habitats are those habitats used by sage-grouse following desiccation of herbaceous vegetation in sagebrush uplands (Connelly et al 2004). Late brood rearing habitat includes sagebrush vegetation with plants that are more succulent and have a perennial water source nearby such as meadows with streams (NatureServe 2010).

In fall and winter months the birds shelter under mature sagebrush. In the winter males and females separate into different groups. Winter habitats of sage-grouse generally are dominated by big sagebrush; however, low sagebrush and silver sagebrush communities also are used during winter (Schroeder et al. 1999). The canopy cover of sagebrush in both arid and mesic sites ranges from ten to 30 percent in wintering habitat and greater sage-grouse use shrub heights of 25-35 centimeters above the snow. They increase the proportion of sagebrush in their diet during the winter and rely on sagebrush exposure above the snow (Connelly et al 2004).

In response to a request for identification of federally-listed and candidate species in the Project Area, the USFWS letter on February 14, 2011, stated that the greater sage-grouse a candidate species, has the potential to occur in the Project Area (USFWS 2011). The NDOW indicated there are no known greater sage-grouse winter distributions, nesting, or core breeding habitats in

the vicinity, defined as a three-mile buffer around the Project Area (NDOW 2011). Further, no greater sage-grouse or sign were observed during the baseline biological surveys in the Project Area (GBE 2010). According to the NDOW, the nearest lek to the Project Area, the Fish Creek Basin 3 lek, is located approximately nine miles to the southwest. The Fish Creek Basin 3 lek is located in T37N, R41 E, Section 2 and is considered active.

The BLM has issued two IMs for the protection of greater sage-grouse. IM 2012-043, *Greater Sage-Grouse Interim Management Policies and Procedures*, provides interim policies and procedures to the BLM to be applied to ongoing and proposed authorizations that affect greater sage-grouse, while long-term permanent measures are being developed (BLM 2011a). IM 2012-044, *BLM National Greater Sage-Grouse Land Use Planning Strategy*, provides direction to the BLM for the consideration of conservation measures, identified in *A Report on National Greater Sage-Grouse Conservation Measures* prepared by the Sage-Grouse National Technical Team, to apply during the land use planning process (BLM 2011b). The NDOW has recently mapped greater sage-grouse habitat in Nevada to support these IMs and published a Habitat Characterization Map in March 2012. The BLM used this NDOW map to create a map identifying Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) on BLM administered lands. According to this map, there is no PPH or PGH located within the Project Area.

#### Prairie Falcon

Prairie falcons commonly occur in arid and semiarid shrubland and grassland community types. They forage over saltbrush, sagebrush, creosote brush, greasewood, agricultural crops, winterfat, and native perennial grasses. They typically nest in cliffs ranging in height from 80 to 325 feet amsl. The prairie falcon tends to nest in areas that do not have dense cheatgrass as it affects their prey base (GBBO 2010).

No nesting habitat is available in the Project Area. The portions of the Project Area that have vegetation represents potential foraging habitat. The NDOW has stated that no raptor nest sites have been identified in the vicinity, defined as a three-mile buffer around the Project Area (NDOW 2011).

#### Golden Eagle

Golden eagles are protected by the MBTA and the Bald and Golden Eagle Protection Act, both of which prohibit take, and is a Nevada BLM sensitive species. The USFWS overall management objective for golden eagle populations is to ensure no declines in breeding populations (USFWS 2010). Golden eagles nest in high densities in open and semi-open habitat, but may also nest at lower densities in coniferous habitat when open space is available. Golden eagles currently breed in and near much of the available open habitat in North America west of the 100<sup>th</sup> meridian. Golden eagles avoid nesting near urban habitats. In the Great Basin, golden eagles nest on cliffs and in scrub forest habitat. Golden eagles forage both close to and far from their nests (up to 5.6 miles from the center of their territory). Foraging distances may be greater in xeric habitats (USFWS 2010).

No nesting habitat is present within the Project Area. The entire Project Area, with the exception of the open water in the Cove Pit Lake, would be suitable foraging habitat for the golden eagle. The NDOW reported directly observing golden eagle within the Project Area. The NDOW reported that no known golden eagle nests occur within thirteen miles of the Project Area (NDOW 2011).

#### Ferruginous Hawk

Ferruginous hawk uses sagebrush, piñon-juniper woodlands and salt desert scrub habitats year round in northern Nevada. Ferruginous hawks in Nevada reportedly prefer landscapes where human presence is minimal and they are generally more sensitive to nest disturbances than most other raptors (GBBO 2010).

The NDOW has stated that no raptor nest sites have been identified within three-mile buffer around the Project Area (NDOW 2011).

#### Swainson's Hawk

Swainson's hawks can be associated with Great Basin and Mojave lowland riparian, agriculture, sagebrush and wet meadow habitats. Ideal habitat features include large riparian nesting trees, agricultural fields, and open shrublands within relatively close proximity. Nesting habitat often consists of platforms in old large trees, cliff ledges, juniper, and old raptor or heron nests (GBBO 2010).

NDOW reported that the Project Area is within the distribution area for Swainson's hawk (NDOW 2010). No Swainson's hawks or nests were observed within the Project Area; however, suitable foraging habitat is present.

#### Western Burrowing Owl

Western burrowing owls breed throughout the western U.S. in open grassland areas. In northern Nevada, the burrowing owl occurs as a summer breeder and migrates south during the winter (Herron et al. 1985). Burrowing owl breeding sites are strongly dependent on the presence of burrows constructed by prairie dogs, ground squirrels, or badgers but may also create their own burrows. Prime burrowing owl habitat must be open, have short vegetation, and contain an abundance of burrows.

During the May 2010 biological surveys conducted by GBE, one burrowing owl was observed within the Project Area (GBE 2010).

#### Loggerhead Shrike

Loggerhead shrikes are typically associated with greasewood and sagebrush communities. They also frequent open country in valleys and foothills. They also frequent open country in valleys and foothills, juniper or piñon-juniper woodlands. Dense stands of trees and shrubs are used for nesting and roosting sites, as well as for hunting perches.

During the May 2010 biological surveys conducted by GBE, one loggerhead shrike was observed within the Project Area (GBE 2010).

### Sage Thrasher

Sage thrashers are most often associated with sagebrush, montane shrubland, and salt desert scrub habitats. Species abundance can be associated with higher shrub densities and a lack of trees. Nest habitat often consists of low branches in dense shrubs (GBBO 2010).

During the May 2010 biological surveys conducted by GBE, one sage thrasher was observed within the Project Area (GBE 2010). The majority of the Project Area has previously been disturbed and reclaimed. The reclaimed seed mix included of salt desert shrub species (fourwing saltbush (*Atriplex canescens*), shadscale (*Atriplex confertifolia*), quailbush (*Atriplex lentiformis*), and winterfat (*Krascheninnikovia lanata*)), several wheatgrasses (streambank wheatgrass (*Elymus lanceolatus ssp. Psammophilus*)), Western wheatgrass (*Pascopyrum smithii*), bluebunch wheatgrass (*Pseudoroegneria spicata*), and other grasses and forbs, as well as one semi-shrub (kochia (*Kochia prostrata*)). The combination of plant species used in reclamation seed mix is not a naturally occurring plant assemblage (GBE 2010).

### Brewer's Sparrow

The Brewer's sparrow is typically associated with montane shrubland, sagebrush, and salt desert scrub habitats. This species prefers high shrub density and relatively large habitat patches and mosaics of varying shrub densities. Nesting habitat often consists of dense crown tall shrubs (GBBO 2010).

No Brewer's sparrows were observed within the Project Area; however, suitable foraging habitat and marginal nesting habitat is available.

### Dark Kangaroo Mouse

Dark kangaroo mice (*Microdipodops megacephalus*) are found throughout North America and is located in scrubland and sagebrush habitat. Shadscale and sagebrush communities with deep sandy soils within the Project Area is considered suitable habitat (Enviroscientists 2012). However, the disturbed and compacted nature of the soils within the Project Area may discourage this species from occupying the Project Area.

### Pale Kangaroo Mouse

Pale kangaroo mice (*Microdipodops pallidus*) are found throughout North America and are located in high cold deserts associated with scrublands and desert vegetation. Shadscale and sagebrush communities with deep sandy soils within the Project Area is considered suitable habitat (Enviroscientists 2012). However, the disturbed and compacted nature of the soils within the Project Area may discourage this species from occupying the Project Area.

## Bats

The NDOW identified that BLM sensitive bat species may roost within abandoned mines near the Project Area and forage nearby; however, during the May 2010 biological survey, no abandoned mines were identified within the Project Area. No other significant roosting habitat, such as caves or rock outcrops, is present within the Project Area. The vegetation to be disturbed on the surface within the Project Area may provide foraging habitat for sensitive bat species. No riparian habitat is present within the Project Area that would represent foraging habitat, but the Cove Pit Lake represents a source of water for local bats and foraging activity. Bat species that may forage in the area include following: western small footed myotis (*Myotis ciliolabrum*); pallid bat (*Antrozous pallidus*); California myotis (*Myotis californicus*); and little brown myotis (*Myotis lucifugus*).

## Windloving Buckwheat

Windloving buckwheat (*Eriogonum anemophilum*) has been identified by the BLM as having potential to occur in the Project Area. Windloving buckwheat is a perennial herb found at high elevations on dry, exposed, relatively barren and undisturbed, gravelly, limestone or volcanic ridges and ridgeline knolls, on outcrops or shallow rocky soils over bedrock. This species is associated with low sagebrush (*Artemisia arbuscula*), Douglas rabbitbrush (*Chrysothamnus viscidiflorus*), Sandberg's bluegrass (*Poa secunda*), bottlebrush squirreltail (*Elymus elemoides*), and King's sandwort (*Arenaria kingii*). This species also occurs at low elevations on dry, relatively barren and undisturbed knolls and slopes of light-colored, platy, volcanic tuff weathered to form stiff clay soils. At the low elevations this species is associated with horsebrush (*Tetradymia canescens*), rubber rabbitbrush (*Ericameria nauseosa*), Douglas rabbitbrush, shadscale (*Atriplex confertifolia*), bottlebrush squirreltail, Basin wildrye (*Leymus cinereus*), and Torrey milkvetch (*Astragalus calycosus*). This species is known to occur between elevations of 4,750 to 9,836 feet amsl. This species has been found in Churchill, Humboldt, Lander, Pershing, and Washoe Counties, Nevada.

A survey of the potential habitat for this species in the area upgradient of the Cove Pit Lake was conducted on May 27, 2010 by GBE. This species was not observed during that site visit. In addition, all of the Project Area proposed for disturbance is within the previously disturbed McCoy/Cove Mine disturbance/reclamation area and it is unlikely that this plant has established itself in the reclaimed areas.

## Sand Cholla

NNHP describes sand cholla occurring in "sand of dunes, dry-lake borders, river bottoms, washes, valleys, and plains in the desert." The species is dependent on sand dunes or deep sand (NNHP 2001).

Sand cholla has been identified as having the potential to occur in the Project Area; however, the disturbed and compacted nature of the soils within the Project Area has likely decreased the potential for occurrence in the Project Area (Enviroscientists 2012). Sand cholla was recently added to the BLM Sensitive Species list and was not surveyed for during baseline biological surveys.

### 3.2.13.2 Environmental Consequences

Several BLM sensitive raptor, bird, and bat species have been observed or are likely to occur in the Project Area. The past mining activities have removed the majority of the native vegetation and wildlife habitat within the Project Area. Despite the disturbed nature of the Project Area, the habitat present has the potential to support sensitive species. Approximately 465.32 acres of habitat would be disturbed over the five-year Project life as a result of implementation of the Proposed Action. Of the 465.32 acres of disturbance proposed, 35.05 acres are currently disturbed by Notice-level exploration activity and existing facilities and roads. The majority of the new disturbance would occur in areas that have been disturbed by previous operations within the Project Area and have been reclaimed. Approximately 390.05 acres of the proposed surface disturbance would occur at the locations shown in Figures 2.1.1 and 2.1.2. Approximately 74.66 acres of proposed disturbance associated with future phases of surface exploration activities could occur anywhere within the Project Area. Vegetation removal, including the reclaimed revegetation that has the potential to support certain species, and ground disturbance would result in a reduction of breeding habitat for sensitive birds in the Project Area. Project related disturbance would result in temporary loss of foraging habitat for raptor species. Ground disturbance and facility construction would also reduce the available habitat for sensitive small mammals. This acreage would not all be disturbed at one time due to phased exploration and nature of the underground operations. In addition, noise and disturbance activities generated from Project operations would have the potential to cause special status wildlife species to avoid utilizing specific locations within the Project Area, or the entire Project Area itself, for foraging and other activities.

The Proposed Action includes measures to avoid nesting migratory birds and raptors (Section 2.1.12); therefore, the destruction of active nests or disruption of breeding behavior of sensitive bird species would not occur as a result of the Proposed Action. Reclamation would begin at the earliest practicable time within the areas considered inactive, without potential, or completed. Reestablishment of vegetation would take place within three years of Project reclamation. Although long-term improvement of habitat could occur in the Project Area as surface disturbance is reclaimed and revegetated and a greater amount of habitat becomes available for special status species, short-term indirect impacts to special status species would occur due to the short-term temporary loss of vegetation as a result of Project-related surface disturbance.

Surface disturbance activities may also increase the spread of noxious weeds and invasive plant species. Russian thistle and cheatgrass have been observed within the Project Area, including the reclaimed areas. The quality of the habitat may be reduced for sensitive species if noxious weeds and invasive plant species increase within the Project Area. AGC would utilize BMPs, as outlined in Section 2.1.12, to reduce the potential for the increase of noxious weeds and invasive plant species both during surface disturbance and reclamation.

Even though environmental protections measures, as outlined in Section 2.1.12, would be implemented to prevent the mortality of sensitive small mammals due to the surface disturbance, there would still be a potential of increased mortality for sensitive small mammals, as a result of surface disturbance activities, e.g., being crushed by vehicles and equipment.

Impacts to the individual sensitive species that are known or have the potential to occur in the Project Area are further discussed below.

### Greater Sage-Grouse

No PPH or PGH is present within the Project Area and no greater sage-grouse or sign was observed during biological surveys. Further, the NDOW indicated there are no known greater sage-grouse nesting, core breeding habitats, or leks in the vicinity of the Project Area. Therefore, impacts to greater sage-grouse are not anticipated from the Proposed Action.

### Prairie Falcon

A maximum of 465.32 acres of habitat would be directly removed over the five-year Project life as a result of implementation of the Proposed Action. However, the majority of potential habitat within the Project Area has been disturbed and ongoing human related disturbance may discourage the use of habitat onsite. In addition, this acreage would not all be disturbed at one time due to incremental disturbance and concurrent reclamation of the surface exploration disturbance. Within a one-mile buffer of the Project Area, a total of approximately 7,747 acres of suitable foraging habitat (i.e. sagebrush, desert scrub habitats) is present. In addition, approximately 2,009 acres within the Project Area would not be disturbed by the Project and has the potential to serve as foraging and nesting habitat. Therefore, a total of 9,756 acres of suitable foraging habitat is available within the Project Area and immediate vicinity for use by the species. The proposed Project disturbance represents approximately less than five percent of the available foraging habitat within the Project Area and immediate vicinity of the Project.

No nesting habitat is available in the Project Area. Within a one-mile buffer around the Project Area, approximately 164 acres of marginal cliff nesting habitat has been identified. The NDOW has stated that no raptor nest sites have been identified in the vicinity of the Project Area (NDOW 2011). Therefore, no direct impacts to nests or nesting habitat would result from the Proposed Action.

### Golden Eagle

Surface disturbing activities associated with the Proposed Action would temporarily impact up to 465.32 acres of golden eagle foraging habitat. However, golden eagles are not expected to regularly use the habitat within the Project Area for foraging due to the lack of known golden eagle nesting in within thirteen miles of the Project Area.

Potential golden eagle nesting habitat (cliffs) is not present in the Project Area and the NDOW reported that no known golden eagle nests are known to occur within over a ten-mile radius of the Project Area. No raptor nests were observed in the pit walls and these walls are accessible by predators and would not likely be occupied. Therefore, the Proposed Action would have no direct impact on golden eagles or their nesting habitat. Within a five-mile buffer around the Project Area, approximately 371 acres of marginal cliff nesting habitat has been identified.

### Ferruginous Hawk

Ferruginous hawks are likely to use the Project Area and vicinity on a limited and transient basis due to the ongoing human caused disturbances. A maximum of 465.32 acres of habitat would be directly removed over the five-year Project life as a result of implementation of the Proposed Action. However, the majority of potential habitat within the Project Area has been disturbed and ongoing human related disturbance may discourage the use of habitat onsite. In addition, this acreage would not all be disturbed at one time due to incremental disturbance and concurrent reclamation of the surface exploration disturbance. Within a one-mile buffer of the Project Area, a total of approximately 7,094 acres of suitable foraging habitat (i.e. sagebrush and salt desert scrub habitat) is present. In addition, approximately 2,009 acres within the Project Area would not be disturbed by the Project and has the potential to serve as foraging and nesting habitat. Therefore, a total of 9,103 acres of suitable foraging habitat is available within the Project Area and immediate vicinity for use by the species. The proposed Project disturbance represents approximately less than five percent of the available foraging habitat within the Project Area and immediate vicinity of the Project.

Ferruginous hawks typically nest in trees and no trees are present within the Project Area and no vegetation communities within a one-mile buffer of the Project Area typically support trees. In addition, no ferruginous hawk nests were reported by GBE or the NDOW within ten miles of the Project Area. Therefore, the Proposed Action would not impact ferruginous hawk nests or nesting habitat.

### Swainson's Hawk

Swainson's hawks are likely to use the Project Area and vicinity on a limited and transient basis due to the lack of nesting habitat nearby. A maximum of 465.32 acres of habitat would be directly removed over the five-year Project life as a result of implementation of the Proposed Action. However, the majority of potential habitat within the Project Area has been disturbed and ongoing human related disturbance may discourage the use of habitat onsite. In addition, this acreage would not all be disturbed at one time due to incremental disturbance and concurrent reclamation of the surface exploration disturbance. Within a one-mile buffer of the Project Area, a total of approximately 7,094 acres of suitable foraging habitat (i.e. sagebrush and salt desert scrub habitat) is present. In addition, approximately 2,009 acres within the Project Area would not be disturbed by the Project and has the potential to serve as foraging and nesting habitat. Therefore, a total of 9,103 acres of suitable foraging habitat is available within the Project Area and immediate vicinity for use by the species. The proposed Project disturbance represents approximately less than five percent of the available foraging habitat within the Project Area and immediate vicinity of the Project.

The majority of the Project Area has been disturbed and reclaimed and does not possess native vegetation community compositions desirable to Swainson's hawk including sagebrush steppe, desert scrub habitats, and agricultural areas. Swainson's hawks typically nest in trees and no trees are present within the Project Area. No Swainson's hawk nests were reported by GBE or the NDOW within ten miles of the Project Area. Therefore, the Proposed Action is not likely to impact Swainson's hawk foraging or nesting habitat.

### Western Burrowing Owl

Western burrowing owl was observed in the Project Area. Construction and operation of the Project would directly affect western burrowing owl habitat through removal of vegetation in areas proposed for surface disturbance. Burrowing owl habitat in the Project Area is limited to berms, washes, and other topographical rises where the soil can support a burrow. Therefore, minimal burrowing/nesting habitat would be impacted by the Project Area. Potential impacts to breeding from the Project would include possible direct loss of nests (e.g., crushing) or indirect effects (e.g., abandonment) from increased noise and human presence within close proximity to an active nest site. Implementation of the environmental protection measure outlined in Section 2.1.12 for migratory birds would ensure that prior to surface disturbance a nesting survey for migratory birds (including western burrowing owl) would be conducted and active burrows and nests avoided.

### Loggerhead Shrike

Loggerhead shrike was observed in the Project Area. Construction and operation of the Project would directly affect loggerhead shrike habitat through removal of vegetation in areas proposed for surface disturbance. A maximum of 465.32 acres of habitat would be directly removed over the five-year Project life as a result of implementation of the Proposed Action. Potential impacts to breeding from the Project would include possible direct loss of nests (e.g., crushing) or indirect effects (e.g., abandonment) from increased noise and human presence within close proximity to an active nest site. Implementation of the environmental protection measure outlined in Section 2.1.12 for migratory birds would ensure that prior to surface disturbance a nesting survey for migratory birds (including loggerhead shrike) would be conducted and nests avoided. In semi-arid habitats, loggerhead shrikes are known to nest in sagebrush, greasewood, and bitterbrush. Some sagebrush occurs in patches within the Project Area. Habitat within the Project Area is considered marginal due to the small isolated patches of sagebrush, sagebrush height, and other varying physical characteristics specific to the Project Area. Vegetation removal would result in a reduction of breeding habitat for loggerhead shrike in the Project Area as the habitat present within the Project Area is diminished but still suitable. This acreage would not all be disturbed at one time due to incremental disturbance and concurrent reclamation of the surface exploration disturbance.

### Sage Thrasher

Sage thrasher was observed in the Project Area. Construction and operation of the Project would directly affect sage thrasher habitat through removal of vegetation in areas proposed for surface disturbance. A maximum of 465.32 acres of habitat would be directly removed over the five-year Project life as a result of implementation of the Proposed Action. Potential impacts to breeding from the Project would include possible direct loss of nests (e.g., crushing) or indirect effects (e.g., abandonment) from increased noise and human presence within close proximity to an active nest site. Implementation of the environmental protection measure outlined in Section 2.1.12 for migratory birds would ensure that prior to surface disturbance a nesting survey for migratory birds (including sage thrasher) would be conducted and nests avoided. The sage thrasher is considered a sagebrush obligate species and is known to nest in sagebrush branches and on the ground beneath sagebrush plants. Some sagebrush occurs in patches within the

Project Area. Habitat within the Project Area is considered marginal due to the small isolated patches of sagebrush, sagebrush height, and other varying physical characteristics specific to the Project Area. Vegetation removal would result in a reduction of breeding habitat for sage thrasher in the Project Area. This acreage would not all be disturbed at one time due to incremental disturbance and concurrent reclamation of the surface exploration disturbance.

#### Brewer's Sparrow

Brewer's sparrow was observed in the Project Area. Construction and operation of the Project would directly affect potential Brewer's sparrow habitat through removal of vegetation in areas proposed for surface disturbance. A maximum of 465.32 acres of habitat would be directly removed over the five-year Project life as a result of implementation of the Proposed Action. Potential impacts to breeding from the Project would include possible direct loss of nests (e.g., crushing) or indirect effects (e.g., abandonment) from increased noise and human presence within close proximity to an active nest site. Implementation of the environmental protection measure outlined in Section 2.1.12 for migratory birds would ensure that prior to surface disturbance a nesting survey for migratory birds (including Brewer's sparrow) would be conducted and nests avoided. Vegetation removal would result in a reduction of breeding habitat for Brewer's sparrow in the Project Area. Some sagebrush occurs in patches within the Project Area. Habitat within the Project Area is considered marginal due to the small isolated patches of sagebrush, sagebrush height, and other varying physical characteristics specific to the Project Area. This acreage would not all be disturbed at one time due to incremental disturbance and concurrent reclamation of the surface exploration disturbance.

#### Dark Kangaroo Mouse

Impacts to dark kangaroo mice include potential burrow destruction and potential mortality by vehicle crushing. As outlined in Section 2.1.12, a pre-disturbance survey would be performed to check for any large colonies of small mammal burrows within the areas subject to disturbance. If an area with a number of burrows is present, it would be avoided if possible. If the burrows cannot be avoided due to the construction of proposed facilities, AGC would consult with the BLM as to if a trapping survey is necessary to confirm presence or absence or other appropriate means of avoiding significant impacts to the species. The Project would impact approximately 465.32 acres of wildlife habitat, but primarily within previously disturbed areas that are not likely to support dark kangaroo mice.

#### Pale Kangaroo Mouse

Impacts to pale kangaroo mice include potential burrow destruction and potential mortality by vehicle crushing. As outlined in Section 2.1.12, a pre-disturbance survey would be performed to check for any large colonies of small mammal burrows within the areas subject to disturbance. If an area with a number of burrows is present, it would be avoided if possible. If the burrows cannot be avoided due to the construction of proposed facilities, AGC would consult with the BLM as to if a trapping survey is necessary to confirm presence or absence or other appropriate means of avoiding significant impacts to the species. The Project would impact approximately 465.32 acres of wildlife habitat, but primarily within previously disturbed areas that are not likely to support pale kangaroo mice.

### Bats

Portions of the Project Area may provide foraging habitat for sensitive bat species, but the Project would not directly affect bat roosting habitat. The Project Area would be reclaimed and reseeded following operations and the foraging habitat would be restored. Therefore, impacts to bats from the Proposed Action would be minimized.

### Windloving Buckwheat

No populations of windloving buckwheat are present in the Project Area. Therefore, this species would not be impacted by the Proposed Action.

### Sand Cholla

A pre-disturbance survey would be performed as outlined in Section 2.1.12 and any populations of sand cholla detected would be avoided if possible. If the population cannot be avoided due to the construction of proposed facilities, AGC would consult with the BLM on the best method to reduce impacts to the population.

## **3.2.14 Transportation**

### **3.2.14.1 Affected Environment**

The Project Area is accessed via McCoy/Cove Mine Road. McCoy/Cove Mine Road intersects with State Route (SR) 305 approximately seven miles east of the Project Area. SR 305 traverses north/south through Lander County. To the north of the Project Area, SR 305 intersects with I-80 at Battle Mountain. To the south, SR 305 intersects with U.S. Hwy 50 west of the Town of Austin. SR 305 is a public road, owned and maintained by NDOT, and its total length is 87.7 miles. SR 305 has a functional classification of Rural Major Collector. According to the Federal Highway Administration (FHWA), Rural Major Collector roads are generally designed to:

- 1) provide service to a county seat not on an arterial route, to the larger towns not directly served by the higher systems, and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, important mining and agricultural areas, etc.; 2) link these places with nearby larger towns or cities, or with routes of higher classification; and 3) serve the more important intracounty travel corridors.” (FHWA 1989).

Lander County has identified the level of service (LOS) for roads within the County as good. (Lander County). For rural two lane major collector roads, the LOS is A if annual average daily traffic (AADT) is at or below 2,500 (NDOT 2011). In 2011, there were 360 AADT in the section of SR 305 7.5 miles south of the County Road/SR 305 intersection. Further north, there were 770 AADT in the section of SR 305 10.5 miles south of the SR 304/SR 305 intersection. In this section in 2009 (the last year data was collected), 95 of the vehicles were heavy trucks and 15 were light trucks. Of the 95 heavy trucks, 60 were identified as seven axle multi-trailer trucks.

(NDOT 2012). At the SR 305 / I-80 interchange (Exit 231), the AADT was 720 at the east bound on-ramp, and 640 at the east bound off-ramp. (NDOT 2012). NDOT has not identified any improvement projects for the section of SR 305 from the McCoy/Cove Mine intersection north to the I-80 intersection in its State Transportation Improvement Plan (STIP) or its Annual Work Plan.

Within Lander County, there were 78 vehicular crashes in 2010. Twenty-one of the crashes involved injuries, and there were three fatalities (NDOT 2012).

AGC would use I-80 to provide access for its vehicles hauling ore from the Project Area to the Newmont Carlin Mill 6 near Carlin or Jarrett Canyon facility outside of Elko. I-80 is a federal four lane interstate traversing east / west across northern Nevada. It connects the communities of Elko in the east and Reno in the west. The section of I-80 connecting Battle Mountain and Elko is four lanes, paved, separated by a median and has a typical posted of speed of 70 miles per hour. Interstates are designed to provide high mobility, carry large volumes of traffic and a variety of vehicles, and provide access between population centers (FHWA 1989).

Newmont Carlin Mill 6 is accessed by heading north on SR 766 , a.k.a., Newmont Mine Rd., from the I-80 interchange for five miles to the facility's entrance. SR 766 is owned and maintained by NDOT. The distance from the 305 / I-80 interchange to the SR 766 / I-80 interchange is approximately 49 miles. Within this distance, I-80 passes through three counties: Lander, Eureka and Elko. In Lander County, the AADT in 2011 was 7,100 at the point 0.6 miles east of the SR 305 / I-80 interchange. This AADT remains consistent as I-80 passes through Eureka County to the Carlin interchange. For 2011, NDOT estimated the AADT to be 7,200 one mile east of the Emigrant Pass interchange (Exit 268). Again, this AADT remains consistent as I-80 continues into Elko County. In 2011, the AADT was 6,900 0.4 mile east of the West Carlin interchange. (Exit 279) (NDOT 2012).

NDOT has not identified any improvement projects for this section of road in its STIP, but it has identified maintenance projects in its Annual Work Plan for a seven mile section of I-80 from Battle Mountain to the east. Anticipated work is to include profile grind and saw and seal joints.

Truck vehicles comprise a large percentage of the vehicles using I-80. For the section of I-80 in Lander County, NDOT in 2007 (last year data was available) classified 3,300 of the vehicles as heavy trucks and 195 as light trucks. Of the 3,300 heavy trucks, 360 were seven axle multi-trailer trucks and 2,700 were five axle semi-tractor trailer trucks (NDOT 2012). Vehicle distribution data was not collected at the Carlin interchange.

SR 766 is a state road and has a functional classification of rural major collector. It is a paved two-lane road with no medians and for the first six miles from the Carlin interchange, there are paved shoulders. The road is in good condition. The AADT in 2011 was 2,200 five miles north of the Central Carlin Interchange (Exit 280). This location is approximately six miles south of the Newmont Carlin Mill 6 mine entrance. In 2008 (the last year NDOT collected vehicle distribution data for this road), 225 of these vehicles were classified as heavy trucks and 110 were classified as light trucks. Of the 225 heavy trucks, 120 were seven axle multi-trailer trucks. (NDOT 2012).

The Jarrett Canyon facility is located off of SR 225 in Elko County. Access to Jarrett Canyon is from I-80 and then heading north on SR 225 for approximately 43 miles. The section of I-80 from the Carlin interchange to the SR 225 interchange is a four-lane highway with medians and paved shoulders. The average speed limit is 70 miles per hour. The AADT for this section of I-80 is 11,000. The interchange of SR 225 and I-80 on the north side has an estimated AADT of 23,000. NDOT has included improvements to the Carlin tunnels and maintenance improvements to I-80 near Elko in its Annual Work Plan.

For LOS, a road classified as an interstate is determined to have a LOS A if the ADT is 46,000 or less (Elko 2011). All applicable sections of I-80 have a LOS A.

SR 225, or Mountain City Highway, is owned and maintained by NDOT. It is a paved four-lane road for one mile north of I-80. West of the intersection of Jennings Ave., SR 225 reduces to two lanes with no medians and unpaved shoulders. It is in good condition. The AADT for 0.6 mile north of the intersection with Argent Ave. is 3,500. Four tenths of a mile south of the intersection with SR 226, the AADT decreases to 1,300. It then increases to an estimated 2,200 AADT at mile post 30. (NDOT 2012). Of these vehicles, 45 were identified as heavy trucks and 70 were classified as light trucks in 2008 (most recent data). The largest heavy truck was identified as a five-axle semi-tractor trailer.

Though SR 225 is a state road, the City of Elko includes SR 225 in the Transportation Element of its Master Plan, as SR 225 is part of the overall transportation network for the City of Elko. The City of Elko has assigned a level of service to its roads, and for NDOT major collector roads, the LOS is an A if there are 2,500 or fewer ADT for two lane highways and 5,000 ADT or fewer for four lane roads. Using this standard, SR 225 has a LOS of A. "LOS A represents free-flow travel with an excellent level of comfort and convenience and the freedom to maneuver" (NDOT 2011). Typically, a LOS of D or better is considered an acceptable level of service (NDOT 2011).

Within Elko County, there were 932 vehicular crashes in 2010. Two hundred and fifteen crashes resulted in injuries, and there were 11 fatalities.

In the Annual Work Plan, NDOT identifies a section of SR 225 for a chip seal project. The improvements would start 14.89 miles north of the SR 226 / SR 225 intersection and end two miles north of the Gold Creek Rd./SR 225 intersection. Additionally, a section of SR 225 from the intersection with SR 535, a.k.a., Idaho Street to 1.14 miles north the Argent Road/SR 225 intersection is scheduled for asphalt improvements.

### 3.2.14.2 Environmental Consequences

AGC generated vehicle trips would come for two sources: workers traveling to and from the Project site and haul trucks transporting ore to Newmont Carlin Mine 6 and Jarrett Canyon and returning to the Project site.

AGC would have a maximum of 27 workers on-site at one time during surface exploration and facility construction. Assuming all 27 workers would travel in individual vehicles for the start of their shift and remain on-site until the end of their shift, AGC's workforce would generate

54 average daily traffic (ADT). The primary access road for workers traveling from Battle Mountain would be SR 305. The AADT in the section of SR 305 north of the Project site is 770. Total anticipated AADT with the Project would be 824.

For haul trucks, AGC would have an average of five trucks a day hauling ore to the Newmont Carlin Mine 6 and Jarrett Canyon. Total number of AADT would be 10. The haul trucks would use SR 305 to access I-80, and AADT for SR 305 with the Project would be 834 (current AADT 770 + workforce AADT 54 + haul truck AADT 10). In order to maintain a LOS A on SR 305, total AADT would need to remain under 2,500. AGC would not generate sufficient vehicle trips to exceed this threshold. Impacts to SR 305 would be minimal.

The haul trucks would travel I-80 to either the Newmont Carlin Mine 6 or Jarrett Canyon sites. The exact number of trucks traveling to the Newmont Carlin Mine 6 site versus the Jarrett Canyon site is unknown, so 50/50 trip distribution is assumed. The AADT is 7,200 in this section of I-80. To the SR 766 / I-80 interchange, AGC would generate an additional 20 AADT. Total AADT with the Project would be 7,220. In order for an interstate to maintain a LOS A, total AADT has to be below 46,000. AGC would not generate sufficient AADT to exceed this threshold. Impacts to this section of I-80 would be minimal. From the SR 766 / I-80 interchange, it is assumed there would be five AADT generated by AGC. This section of I-80 has an AADT of 11,000. Total AADT with the Project would be 11,005. AGC would not generate sufficient vehicle trips to exceed the 46,000 AADT to reduce the LOS to B. Impacts to I-80 would be minimal.

Again assuming half the haul truck trips go to the Newmont Carlin Mine 6 site, AGC would generate an additional five AADT on SR 766. The AADT for SR 766 is 2,200. Total AADT with the Project would be 2,205. To maintain a LOS A on a two-lane rural major collector road, the AADT needs to be 2,500 or less. AGC would not generate sufficient vehicle trips to exceed this threshold. For SR 205, AGC would generate an additional five AADT. Current AADT in the section of SR 205 closest to the Jarrett Canyon site entrance is 2,200. Total AADT with the Project would be 2,205. AGC would not generate sufficient vehicle trips to reduce the LOS to B. Impacts to SR 776 and 205 would be minimal.

The transportation network can support the increase in truck and commuter traffic; therefore, no impacts to the overall transportation network are anticipated from the Proposed Action. This resource is not analyzed further in this EA.

### **3.2.15 Vegetation**

#### **3.2.15.1 Affected Environment**

Based on the Gap Analysis Program data from the United States Geologic Survey (USGS), the primary vegetation of the Project Area is salt desert scrub (USGS 2011). The Project Area lies entirely within disturbed acreage that has been reclaimed. The reclaimed areas were seeded with a mixture of native and non-native species. The major shrubs on the reclaimed area are fourwing saltbush, shadscale, quailbush (*Atriplex lentiformis*), and forage kochia (*Bassia prostrata*). Bottlebrush squirreltail, streambank wheatgrass (*Elymus lanceolatus* ssp. *psammophilus*), and

bluebunch wheatgrass (*Pseudoroegneria spicata*) are the dominant grasses and forbs and are generally sparse (GBE 2010).

### 3.2.15.2 Environmental Consequences

Approximately 465.32 acres would be disturbed over the five-year Project life as a result of implementation of the Proposed Action. Of the 465.32 acres of disturbance proposed, 35.05 acres are currently disturbed by Notice-level exploration activity and existing facilities and roads. The majority of the new disturbance would occur in areas that have been disturbed by previous operations within the Project Area and have been reclaimed. Approximately 390.05 acres of the proposed surface disturbance would be at the locations shown in Figures 2.1.1 and 2.1.2. Approximately 74.66 acres of proposed disturbance associated with future phases of surface exploration activities could occur anywhere within the Project Area. The surface exploration disturbance would be created incrementally and would be dispersed throughout the Project Area.

The surface disturbance associated with the surface exploration would be reclaimed and reseeded concurrently whenever feasible. Any surface disturbance related to the Proposed Action would not result in the loss of any unique vegetation community, but would still result in the temporary loss of reclaimed vegetation. Reclamation associated with the proposed surface facilities would begin upon completion of Project activities using the BLM-approved seed mixture shown in Table 2.1-11 with the species that successfully revegetated through the previous reclamation process. The BLM-approved seed mixture would be similar to the existing reclaimed vegetation composition. Monitoring activities are included in the Proposed Action, which would ensure that the revegetation meets reclamation standards.

### 3.2.16 **Visual Resources**

#### 3.2.16.1 Affected Environment

The Visual Resource Management (VRM) system designates classes for BLM-administered lands in order to identify and evaluate scenic values to determine the appropriate levels of management during land use planning (Table 3.2-19). Each management class portrays the relative value of the visual resources and serves as a tool that describes the visual management objectives (BLM 1986b).

Lands within the Project Area are designated as VRM Class IV. The activities associated with mining and surface disturbance may require modifying the existing character of the landscape; however, there have been prior mining activities in the Project Area and the surface has previously been modified. The Project Area has an existing open pit and large reclaimed WRDFs that have affected the form, line, color and texture of the natural features that existed prior to past mining activities as illustrated in the photograph on the cover of this EA. In addition, the Project Area is approximately seven miles off State Route 305, so is not clearly visible to travelers on the highway.

**Table 3.2-19: BLM Visual Resource Management Classes**

Class	Description
I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any change must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the character 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.
IV	The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Source: BLM 1986b

### 3.2.16.2 Environmental Consequences

The Project would result in short-term visual impacts principally affecting the visual elements of line and color with the construction of surface support facilities. Disturbance of vegetation would cause moderate, temporary color contrasts. With successful reclamation and revegetation, long-term visual impacts would be minimized. The effects of the Project to visual resources would be consistent with BLM prescribed Visual Resource Inventory Class IV objectives. Therefore, this resource is not analyzed further in this EA.

### 3.2.17 **Wastes, Solid or Hazardous**

#### 3.2.17.1 Affected Environment

Federal and State of Nevada hazardous material and waste laws and regulations are applicable to hazardous substances used, stored, or generated by the Project. Applicable federal laws would include the following: the Resource Conservation and Recovery Act of 1976; Hazardous and Solid Waste Amendments; Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA [aka Superfund]); and the Superfund Amendments and Reauthorization Act of 1986. Pursuant to regulations promulgated under Section 102 of CERCLA, as amended, release of a reportable quantity of a hazardous substance to the environment in a 24-hour period must be reported to the National Response Center (40 CFR Part 302). A release of a reportable quantity on public land must also be reported to the BLM.

Similarly, Nevada hazardous material and waste laws and regulations are applicable to hazardous substances used, stored, and generated by the operation of the Project. NAC 445A.240 requires immediate reporting of a release of a reportable quantity of a hazardous substance to the NDEP, based on Table 302.4 in 40 CFR Part 302.

The Lander County Master Plan includes a Safety Plan Element. The Safety Plan Element identifies the transportation of hazardous and volatile materials through communities in Lander County as a primary safety problem. The Lander County Department of Emergency Management developed an Emergency Response Plan (adopted in 1994) to comprehensively plan for effective mitigation, preparation, response, and recovery of any natural, technological/man-made, or war-related disaster.

Chemicals and materials anticipated to be used at the Project Area are listed in Table 3.2-20. The quantities of each substance to be stored on site are not yet known, except for the diesel fuel, which would be stored in an existing 10,000-gallon tank. No hazardous material would be created as a result of the Project (GBE 2010).

**Table 3.2-20: Hazardous Materials to be Used and Stored at Cove-Helen**

Substance	Storage Location	Reportable Spill Quantity
Diesel fuel (10,000 gallons)	Fuel Storage Pad; adjacent to the lined Laydown Storage and Ready Line facilities	The reportable quantity for petroleum products such as gasoline, diesel, and hydraulic fluid is 25 gallons or 3 yd <sup>3</sup> of contaminated material, or the presence on or in ground water.
Oils (lubricant, hydraulic, other)	Fuel Storage Pad; adjacent to the lined Laydown Storage and Ready Line facilities	The reportable quantity for hazardous waste is based on the Federal EPA guidelines established under Title III List of Lists (40 CFR 302.4).
Ethylene glycol	Fuel Storage Pad; adjacent to the lined Laydown Storage and Ready Line facilities	The reportable quantity for ethylene glycol is 5,000 lbs., and is based on the Federal EPA guidelines established under Title III List of Lists (40 CFR 302.4).
Cleaning solvents	Fuel Storage Pad; adjacent to the lined Laydown Storage and Ready Line facilities	The reportable quantity for hazardous chemicals is based on the Federal EPA guidelines established under Title III List of Lists (40 CFR 302.4).

The delivery of materials to the Project Area would be by common carrier. The schedule of delivery of materials would depend on the rate of usage, with diesel fuel being the material to be most frequently delivered. At least two deliveries per month during the height of operation are anticipated (GBE 2010). Solid waste would be collected, stored and disposed of off site at an approved facility during operations and following closure of Project.

### 3.2.17.2 Environmental Consequences

The generation of wastes and the use of hazardous materials as a result of the Proposed Action may result in the release of these wastes or materials. Vehicles traveling on public roads in the Project Area would result in the presence of other hazardous materials and wastes (e.g., fuel, antifreeze, battery acid, lead tire weights, mercury switches, or catalytic converters) for the duration of travel. Section 2.1.4.3 of this EA outlines how these wastes and materials would be managed and stored.

Through the implementation of the spill measures outlined in Section 9.5 of the Plan and the environmental protection measures outlined in Section 2.1.12 of this EA, no impacts to the environment from wastes are anticipated as a result of the Proposed Action. This element is not analyzed further in this EA.

### 3.2.18 Water Resources

#### 3.2.18.1 Affected Environment

##### *Surface Water*

The Project is located within Hydrographic Basin 4 of the Nevada (Humboldt River Region), Hydrographic Area 59, Lower Reese River Valley. The portal and surface facilities are located near the southwest part of the basin, which generally drains east into the Reese River Valley. Hydrographic Basin 4 is typical of arid drainage basins in northern Nevada, where precipitation is generally insufficient to support perennial stream flow except where they are spring fed. Drainages begin in the higher elevations of the Fish Creek Mountains and flow northeast to the Reese River Valley.

There are ephemeral and intermittent drainages within a five-mile radius of the Project Area. Reese River and Horseshoe Basin are the closest named ephemeral drainages to the Project site and they are located approximately six miles east and south of the Project site, respectively. These drainages flow only during times of high precipitation and during spring runoff when the winter snow pack is high. No water quality data are available for these drainages. Fish Creek is the nearest perennial stream and is located approximately eight miles southwest of the Project Area. A single flow measurement of one to two cubic feet per second was taken at the mouth of Fish Creek Canyon in the summer of 1996. Periodic flow measurements were collected at the mouth of Fish Creek by the USGS from 1977 to 1985. High flows generally occur in April and May and low flows occur in October. During this period, the USGS recorded total stream flow rates for each month. The highest recorded total flow rate for a given month was 586 cubic feet per second (cfs) in May 1984 and the lowest recorded total flow rate for a given month was 17.8 cfs in November 1977 (Hydrogeo 2010a). Total monthly averages for the nine year monitoring period are identified in Table 3.2-21.

**Table 3.2-21: Total Average Stream Flow for Fish Creek**

Month	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Average Flow Rate from 1977-1985 (cfs)	50.96	55.01	87.52	226.89	257.47	142.52	106.16	45.06	46.25	40.9	41.91	49.55

Source: Hydrogeo, Inc. 2010a

Echo Bay collected a water quality sample in Fish Creek in the summer of 1996. This sample was tested for major anions and cations to help determine the relationship between springs and surface water systems in the area. The results of this analysis indicated that Fish Creek water is a calcium-sodium bicarbonate chloride type with a moderate TDS concentration of 366 milligrams per liter (mg/L) and a relatively high pH of 9.07 (HydroGeo, Inc. 2010a).

There are seven known springs within a five-mile radius of the Project site, SW McCoy #1, SW McCoy #2, SW McCoy #3, Horseshoe Basin Spring, Gilman Spring, and two springs noted in the NDWR records POD-17 and POD-18. These springs are located south and west of the Project site. Flows were measured at the McCoy and Horseshoe Basin springs in the summer of 1996 and ranged from 1.3 gpm at SW McCoy #1 to less than one gpm at SW McCoy #2, SW McCoy #3 and Horseshoe Basin springs. No water rights are associated with these springs. Flow and water quality data are not available for the POD springs. Samples collected from the springs exclusive of the POD springs were tested for major anions and cations to help determine the relationship between springs and the ground and surface water systems in the area. The analyses showed that the spring waters are calcium-sodium bicarbonate chloride type and have moderate TDS concentrations ranging from 346 mg/L at SW McCoy #3 to 498 mg/L at SW McCoy #2. The pH values of the springs were variable ranging from 6.5 at SW McCoy #3 to 9.19 at Horseshoe Basin Spring. The data indicates that the field water quality of the springs is similar to the water quality of Fish Creek, indicating there may be a close geochemical connection between the springs and surface water.

### *Ground Water*

Two ground water systems exist in the Project vicinity, an unconfined shallow aquifer and a deep, confined bedrock aquifer. The shallow unconfined aquifer, depending on location, is within the Quaternary or Tertiary shallow bedrock or alluvium. The regional water table is within this shallow unconfined aquifer. The crest of the Fish Creek Mountains forms a surface water drainage divide and also serves as a drainage divide for the shallow ground water system. Since most of the recharge to the ground water system occurs in the mountain areas, flow in the shallow ground water system in the Project Area is from the west to the east toward the Reese River Valley.

The deep confined bedrock aquifer (going from upper to lower units) includes the following hydrogeologic units: Smelser Pass; Panther Canyon; and Home Station members of the Augusta Mountain and Favret Formations. Generally, the primary hydraulic conductivity of the deep bedrock system is low and most of the ground water flow is within the faults and fractured rock (secondary hydraulic conductivity). Since most the faults and associated fracture systems in the Project Area strike generally northeast-southwest, flow in the deep ground water system is from the southwest to the northeast from the highlands toward the Lower Reese River Valley and Humboldt River (HydroGeo, Inc. 2010a).

Ground water level data for monitoring wells within a five-mile radius of the Project Area range from approximately 36 to 90 feet below the ground surface. Currently, ground water in the Project Area is at an approximate elevation of 4,600 feet amsl.

Water quality data from the McCoy/Cove Mine WY2000 Annual WPCP Report was reviewed by HydroGeo, Inc. to support the baseline Hydrogeological and Geochemical Technical Report (HydroGeo, Inc. 2010a). Year 2000 was the last full year of active mining at the Cove Mine. The required monitoring in year 2000 included alluvial wells IM-2 and IM-3, alluvial ranch wells FIN and FIW, and bedrock dewatering wells DW-3a, DW-5, DW-8, DW-9, DW-10, and DW-13. In 2000, the water quality in the alluvial wells were below the Profile I Nevada Reference Standards (NDEP 2009) with the exception of slightly elevated arsenic concentrations at IM-2

(0.011 mg/L) and IM-3 (0.012 mg/L) (Echo Bay 2001). In 2000, the ground water from bedrock dewatering wells were generally below Profile I Nevada Reference Standards (NDEP 2009), with the exception of arsenic, antimony, and one exceedance of manganese. The arsenic concentrations of the bedrock dewatering wells were below the reference standard of 0.010 mg/L at well DW-9 (0.008 mg/L) and exceeded the standard at wells DW-3a (0.014 mg/L), DW-5 (0.053 mg/L), DW-8 (0.016 mg/L), DW-10 (0.098 mg/L), and DW-13 (0.16 mg/L). The antimony concentrations of these wells were below the reference standard of 0.006 mg/L except at wells DW-3a (0.0075 mg/L), DW-5 (0.028 mg/L), and DW-13 (0.015 mg/L). Manganese levels were below the reference standard of 0.10 mg/L at all of these wells with the exception of DW-13 (0.11 mg/L).

There have been no reported mining induced impacts to the alluvial or bedrock ground water quality from the McCoy/Cove mining activities. Ground water quality is currently monitored at the McCoy/Cove Mine as part of the permit (NEV88009) requirements during closure activities. Wells IM-2 and IM-3 are currently dry or have insufficient water to sample. The data for four recent years (2006-2009) show that the water quality in the alluvial and bedrock wells have been generally below Profile I Nevada Revised Standards (NDEP 2009), with the exception of arsenic, and occasional elevated levels of fluoride, iron, and aluminum. For specific details on the water quality of the alluvial and bedrock wells, refer to Tables 11 through 15 of the *Hydrogeologic and Geochemical Technical Report* (HydroGeo 2010a). Arsenic levels were reported as less than 0.025 mg/L in 2006 and could potentially be elevated above the Nevada Revised Standard of 0.010 mg/L at LP-2D, LP-5B, TM-3, TM-4, and TM-5. Arsenic levels were elevated at well TM-3 in 2009 (0.0148 mg/L). Fluoride levels were elevated above the current Nevada Revised Standard of 4.0 mg/L in all four years (2006- 2009) at Well LP-2D (4.79 mg/L, 5.60 mg/L, 5.82 mg/L and 5.84 mg/L, respectively) and at Well LP-5B (5.17 mg/L, 5.26 mg/L, 5.50 mg/L and 5.08 mg/L, respectively). Iron concentrations were elevated above the Nevada Revised Standard of 0.6 mg/L at LP-2D in 2006 (5.16 mg/L) and TM-4 in 2007 (0.914 mg/L). Aluminum concentrations were elevated above the current Nevada Revised Standard of 0.2 mg/L in 2006 and 2007 at TM-4 (0.547 and 1.23 mg/L, respectively). Water quality of the Cove Pit Lake can be found in the WPCP.

During Newmont's operations of the Cove Mine, active dewatering was necessary. The ground water flow direction was primarily from the west to the east and flows into the mine occurring primarily along faults and fracture systems and to a lesser degree from the hydrogeologic units. This dewatering utilized the existing RIB structure to deal with excess water, similar to the Project's proposed dewatering management process. There have been no reported impacts to the alluvial or bedrock ground water quality from the McCoy/Cove closure activities (HydroGeo 2010b).

### 3.2.18.2 Environmental Consequences

#### *Surface Water*

There are intermittent and ephemeral drainages within the Project Area. In areas where Project roads and facilities would cross these drainages, an increase in storm water runoff and soil erosion may occur. As a result, sedimentation may increase in these drainages and water quality may be impacted. To mitigate these impacts, AGC would implement the environmental

protection measures identified in Section 2.1.12. Additionally, AGC would monitor soil erosion along drill roads and overland routes during the spring and fall and after storm events. For the main access road and any haul roads constructed, V ditches would be placed alongside the roads, and these ditches would convey stormwater runoff to the sedimentation ponds. .

### *Ground Water*

A simplified single layer ground water flow model was developed for the Project to determine the potential effects of ground water disposal through the RIBs to the Reese River alluvial aquifer. Details of the modeling setup and results are included in the *Hydrogeologic and Geochemical Technical Report* (HydroGeo, Inc. 2010a). The finite difference code MODFLOW-SURFACT (MFST) Version 3 (HydroGeo, Inc. 2008) program was selected for the ground water model. The model incorporated a domain of 80 square miles bounded by the Fish Creek Mountains on the west and the Reese River on the east. The Lighthouse Fault was modeled as a constant head boundary simulating discharge from precipitation from higher in the mountains and from other shallow aquifers into the alluvium at this point. The depth of the alluvium was assumed to increase linearly from west to east from the Lighthouse Fault to the Reese River, from approximately 130 feet to about 1,000 feet. Every active model cell was assigned unique values for hydraulic conductivity, specific yield and specific storage. All hydraulic values were assumed to be uniform throughout the model area and were derived from work performed by HCI (1999 and 2001) in the Project Area. The hydraulic conductivity was assumed to be ten feet/day, storativity 0.03, and specific yield 0.15.

The maximum estimated annual infiltration for the RIBs derived from the preliminary Project water balance and was distributed over an approximated RIB area of 800,000 square foot (30 cells). The infiltration rates used are summarized below:

- Year 1 - 1,065 acre-foot/year (12 inches/day)
- Year 2 - 1,813 acre-foot/year (21 inches/day)
- Year 3 - 1,346 acre-foot/year (16 inches/day)
- Year 4 - 878 acre-foot/year (ten inches/day)

Ground water mounding from infiltration in the RIBs is predicted. However, this is considered beneficial to the local aquifer due to increased recharge. A similar RIB system was used by Echo Bay from 1988 to 2000 to successfully dispose of up to 23,000 gpm of water from the Cove Mine dewatering activities. There have been no reported negative impacts resulting from the Cove Mine dewatering and infiltration activities (HydroGeo 2010b). The maximum extent of the ground water mounding from the RIBs operations occurs in Year 4 of operations where the one-foot mounding extends less than two miles east of the site. The nearest drinking water well to the Project site is the Filippini Ranch well located about six miles northeast of the RIBs, well beyond the predicted zone of mounding effects. A limited amount of ground water mounding from infiltration in the Project RIBs is predicted. However, this is considered beneficial to the local aquifer, due to increased local recharge. A similar RIB system was used by Echo Bay from 1988 to 2000 to successfully infiltrate up to 23,000 gpm of water from the Cove Mine dewatering activities. There have been no reported negative impacts resulting from the Cove Mine dewatering and infiltration activities (Newmont 2010). In sum, the Proposed Action proposes to discharge a smaller amount of water (an order of magnitude less) into the RIBs than the former

Newmont operations and would result in only a limited amount of mounding which would beneficially impact the local aquifer.

Currently, ground water in the Project Area is at an approximate elevation of 4,600 feet amsl therefore, the portal and initial 674 feet of the decline would be above the water level and not subject to ground water inflows (HydroGeo, Inc. 2011a). To anticipate the need for ground water inflow, AGC would install a pilot borehole drilled in advance of and parallel to the decline or a single short “feeler hole” in the face of decline as it advances. “Feeler holes” would likely be drilled at select sections based on geology and other indications for the potential to encounter high ground water inflow (HydroGeo, Inc. 2011b). In the case of potential high ground water inflows that are determined to be connected to a ground water source or compromise ground support, a cover grouting program would be applied to control ground water flows. Large volume, continuous flow, without substantial reduction within a few days would indicate that grouting is needed. Grouting is a very effective way to control excess ground water inflow and can reduce inflow by 80 percent (HydroGeo, Inc. 2011b). Therefore, with the implementation of the pilot or feeler holes and grouting application, the Proposed Action would not have an impact on surface water and ground water interactions.

#### *Ground Water Quality*

A general impact to ground water quality could result from stockpiled ore and waste rock piles. Interaction of infiltrating water with mining-related wastes could result in low pH effluent, commonly called acid rock drainage. The MWMP results from the ore material indicated limited potential to release antimony, arsenic, manganese, sulfate, and thallium. The results from the low-grade material indicated limited potential to release antimony, arsenic, sulfate, and thallium. The results from the Smelser Pass Limestone indicated no potential to release harmful constituents. The results from the Panther Canyon Conglomerate indicated a limited potential to release manganese, nickel, and sulfate. The results from the Favret Limestone indicated a limited potential to release arsenic, selenium, sulfate, and thallium. However, based on the engineering design of the proposed facilities, measures such as liners as described in Section 2.1.4.8 and 2.1.4.9 would be in place to prevent the mobilization of these materials into the environment. In addition, the Panther Canyon Conglomerate indicated a potential to produce an acidic effluent; however, the material containing this rock type would be transported off site as ore for processing.

A mechanical treatment system would be designed as described in Section 2.1.4.11.2 to treat dewatering water prior to infiltration through the RIB units. Treated effluent from the proposed water treatment facility would meet NDEP Profile I standards. The mechanical treatment options likely to be considered are nano-filtration or reverse osmosis treatment, depending on the water quality prior to treatment. Both nano-filtration and reverse osmosis treatments are known to treat and remove nitrates, which are the specific dewatering contaminant of concern, as well as most other salts (Frenkel 2008). Therefore, ground water quality would not deteriorate with the use of a mechanical treatment system prior to the RIB units.

### 3.2.19 Wildlife

#### 3.2.19.1 Affected Environment

Wildlife habitat in the vicinity (ten-mile radius) of the Project Area is associated with the salt desert scrub vegetation community. The Project Area has been previously mined and reclaimed with native and non-native vegetation (Section 3.2.14). The quality of wildlife habitat present within the Project Area has been diminished by past mining and exploration activities which has removed native vegetation from the Project Area.

In May 2010, GBE performed a general wildlife survey in the Project Area. In addition, the USFWS and NDOW were contacted regarding the presence of wildlife species within and near the Project Area. The following discussion summarizes the results of the survey including which species were observed or detected within the Project Area as well as species likely to be present or to utilize the Project Area based on the information provided by the USFWS and NDOW (USFWS 2011 and NDOW 2011b).

#### *Mammals*

In addition to the special status species discussed in Section 3.2.13, wildlife in the vicinity of the Project Area includes mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus auduboni*), badger (*Taxidea taxus*), least chipmunk (*Eutamias minimus*), desert packrat (*Neotoma cinerea*), yellow-bellied marmot (*Marmota flaviventris*), and a variety of other small rodents (GBE 2010). Fencing around the perimeter of the site may preclude larger mammals from utilizing the Project Area.

#### *Birds*

A list of migratory birds, including raptors that have the potential to occur within the Project Area is included in the discussion in Section 3.2.6. In addition to those species previously discussed, the common raven (*Corvus corax*) and the chukar partridge (*Alectoris chukar*) also occur in the Project Area. Waterfowl species are also known to use the Cove Pit Lake during migration (GBE 2010). Common waterfowl species expected to occur include mallard (*Anas platyrhynchos*), cinnamon teal (*Anas cyanoptera*), and northern pintail (*Anas acuta*).

#### *Amphibians and Reptiles*

Several species of reptiles use the rocky areas and reclaimed areas in the Project Area. Species observed by GBE included: desert horned lizard (*Phrynosoma platyrhinos*); sagebrush lizard (*Sceloporus graciosus*); western fence lizard (*Sceloporus occidentalis*); bull snake (*Pituophis melanoleucus sayi*); and western rattlesnake (*Crotalus oreganus lutosus*) (GBE 2010).

The Cove Pit Lake is the only perennial water sources in the Project Area. The next closest perennial water source is the Humboldt River, which is located approximately 20 miles north of the Project Area. The Cove Pit Lake does not provide adequate habitat for amphibians and due to

the distance between perennial water sources and the Project Area, it is unlikely that amphibians are present in the Project Area.

### *Fish*

No perennial streams or native fish habitat occur in the Project Area. The Cove Pit Lake has the potential to support fish based on the water quality, but no fish have been introduced into this feature.

#### 3.2.19.2 Environmental Consequences

Direct impacts to wildlife would consist of temporary habitat loss and disturbance from human activity and noise. Approximately 465.32 acres would be disturbed over the five-year Project life as a result of implementation of the Proposed Action. Of the 465.32 acres of disturbance proposed, 35.05 acres are currently disturbed by Notice-level exploration activity and existing facilities and roads. The majority of the new disturbance would occur in areas that have been disturbed by previous operations within the Project Area and have been reclaimed. Approximately 390.05 acres of the proposed surface disturbance would be at the locations shown in Figures 2.1.1 and 2.1.2. Approximately 74.66 acres of proposed disturbance associated with future phases of surface exploration activities could occur anywhere within the Project Area. The surface exploration disturbance would be created incrementally and would be dispersed throughout the Project Area. No long-term impacts to wildlife habitat are likely to occur since reclamation would take place within one year after Project completion and reestablishment of vegetation would likely occur within three years. Reclamation activities would occur concurrently with Project activities when feasible.

Construction of roads and office facilities, as well as the entry portal and decline using the drill and blast mechanism could disturb wildlife due to the presence of humans and by creating noise and dust. Wildlife foraging activities within the Project Area could continue since the proposed surface disturbance activities only cover approximately 19 percent of the entire Project Area (465.32 acres out of a total of 2,474 acres); therefore, the Project is not anticipated to result in substantial direct impacts to wildlife species. Further, many species present are likely adapted to disturbance and noise.

Cheatgrass and Russian thistle have been observed within the Project Area, including the previously reclaimed areas. These noxious and invasive species reduce the quality of habitat for wildlife. Project related activities increase the potential for the spread of these species, in addition to the spread of other noxious weeds and invasive species; thus further reducing the quality of wildlife habitat. AGC would implement the environmental protection measures outlined in Section 2.1.12, which would mitigate or reduce the impact of noxious weeds and invasive species to wildlife habitat.

Although long-term improvement of habitat could occur in the Project Area as surface disturbance is reclaimed and revegetated and a greater amount of forb species becomes available for wildlife foraging, minimal short-term indirect impacts to wildlife would occur due to the short-term temporary loss of vegetation as a result of Project-related surface disturbance.

Impacts to specific wildlife groups are discussed in more detail below.

#### *Small mammals*

Due to ground disturbance activities, there would be a potential of direct mortality to small mammals (e.g., being crushed by vehicles or equipment). To mitigate or reduce this potential impact, AGC would implement the mitigation measures identified in Section 2.1.12.

Ground disturbance activities would also impact small mammal habitat by removing vegetation and rocks and disturbing burrows. These impacts would be short-term, and habitat could be restored during reclamation.

#### *Large mammals*

Large mammals, such as mule deer and pronghorn antelope, may avoid the Project Area due to noise generated by the Project. Other large mammals, such as coyotes, would adapt to the noise and disturbance from the Project. Fencing around the perimeter, however, may prevent larger mammals from entering the Project Area. These impacts would temporarily reduce the available habitat area for large mammals. Impacts would be temporary as fencing would be removed during reclamation, and the Project Area would be revegetated and reclaimed as specified in Section 2.1.9.

#### *Birds*

Surface disturbance would affect available nesting area and could potentially destroy nests located within the disturbance areas. Pre-disturbance surveys would occur to prevent the destruction of occupied nests for avian species protected under the MBTA. Removal of vegetation would reduce foraging areas. In addition, temporary noise-related disturbance could impact the waterfowl in the Cove Pit Lake. Impacts would be temporary, as areas would be reclaimed upon Project completion.

#### *Amphibians and Reptiles*

Amphibians are not present within the Project Area. Reptiles would be impacted by surface disturbance activities, which would remove vegetation and disturb soil. Surface disturbance would remove potential areas for the desert horned lizard, western lizard, and sagebrush lizard to lay their eggs or could destroy eggs laid within disturbance areas. Loss of vegetative cover and burrows could result in greater mortality due to predators. Snakes would be impacted by disturbance to dens and soils and potential destruction of eggs during breeding season. Temporary disturbance would reduce forage area.

Impacts would be temporary, and vegetation would be restored during reclamation.

### **3.3 Effects of the No Action Alternative**

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur. However, AGC would continue surface mineral exploration activities currently

authorized under Notice No. NVN-087927 in the Project Area, and would result in impacts from the surface exploration activities for a total of 4.78 acres. Newmont would also continue closure management activities at the Cove Pit Lake.

### **3.3.1 Air and Atmospheric Values**

Under the No Action Alternative, Notice-level exploration activities under Notice No. NVN-087927 would continue and include surface disturbance of 4.94 acres on public land. No stipulations for air quality were included in the BLM acknowledgment letter dated October 14, 2009; however, AGC would control dust by minimizing surface disturbance and observing prudent speed limits. Therefore, under the No Action Alternative, dust would be generated by travel on dirt roads and emissions would be generated from drill rigs, support equipment, and vehicles during exploration activities. These emissions would cause a minor short-term localized impact to air quality. The reclamation of surface disturbance would gradually eliminate long-term impacts to air quality from wind erosion of disturbed soils. Although impacts are similar under the No Action Alternative, impacts would be less than under the Proposed Action, as there would be 430.27 fewer acres of new surface disturbance under the No Action Alternative.

### **3.3.2 Cultural Resources**

Although the No Action Alternative would result in 430.27 fewer acres of surface disturbance than the Proposed Action, impacts would be the same. Any previously mapped eligible or unevaluated sites would be avoided as specified in the acknowledgement letter issued by the BLM for Notice No. NVN-087927. Environmental protection measures identified for the Proposed Action include the same stipulations.

### **3.3.3 Fire Management**

Under the No Action Alternative, no impacts to fire management would occur, as there are no active fuel treatment areas within the existing Project Area boundary. Therefore, impacts under the No Action Alternative would be the same as under the Proposed Action.

### **3.3.4 Geology and Mineral Resources**

Under the No Action Alternative, exploration drilling would be conducted which would only result in the removal of small amounts of rock from the borings. Impacts to geology resources under the No Action Alternative would be less than under the Proposed Action, as the diamond drilling and bulk sampling would not occur.

### **3.3.5 Land Use and Realty**

Under the No Action Alternative, which consists of Notice-level surface exploration activities, AGC did not propose any changes or alterations to existing roads outside the Project Area. Therefore, there would be no anticipated impacts to land use, access, or realty resulting from the No Action Alternative.

### **3.3.6 Migratory Birds**

No direct impacts to migratory birds would result from the No Action Alternative because AGC would conduct pre-disturbance surveys associated with the Notice-level exploration activities during breeding bird season to comply with the MBTA. Up to 4.94 acres of migratory bird habitat may be disturbed as a result of the surface exploration activities. Most of this disturbance would occur in areas that have been disturbed by previous activities at the site and this disturbance would be reclaimed following exploration activities.

### **3.3.7 Native American Religious Concerns**

Under the No Action Alternative, AGC would continue their Notice-level surface mineral exploration activities. The BLM MLFO has continual consultation with the local Tribes with regards to ongoing and proposed projects and land management activities. No concerns pertaining to the existing Notice-level exploration activities have been brought to the BLM's attention; therefore, at this time there would be no impacts to Native American Religious Concerns as a result of the No Action Alternative.

### **3.3.8 Noxious Weeds, Invasive and Non-native Species**

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing activities currently authorized in the Project Area would continue to occur and may result in impacts from noxious weeds, invasive and non-native species. Under the Notice-level exploration activities, AGC would work with the BLM authorized officer to monitor and treat any noxious weed problems should they arise, as well as utilize Newmont's noxious weed control program.

### **3.3.9 Paleontological Resources**

The No Action Alternative consists of exploration drilling under the existing Notice and would only result in the removal of small amounts of rock from the borings. Based on the discussion of the geologic formations present in the Project Area and the lack of the past mining operations encountering any paleontological resources, under the No Action Alternative, there would be no impacts to paleontological resources.

### **3.3.10 Rangeland Management**

Under the No Action Alternative, no impacts to rangeland management would occur, as the Project Area is fenced, which prevents access to the Project Area for rangeland animals to graze.

### **3.3.11 Socioeconomic Values**

Under the No Action Alternative, ongoing mineral exploration activities are currently permitted in the Project Area, which consist of surface drilling activities. This type of exploration requires less of a work force and is more intermittent in nature. The No Action Alternative would result in beneficial impacts to the local economies, as the workers would obtain lodging, meals, and supplies in these local communities. However, under the No Action Alternative, impacts to

public services and housing would be less than under the Proposed Action, as there would be fewer employees needing services in impacted communities.

### **3.3.12 Soils**

Under the No Action Alternative, surface disturbance activities would impact approximately 4.94 acres. The potential for wind and water erosion of disturbed soils would be similar but incrementally less than those associated with the Proposed Action, since the No Action Alternative would be disturbing 430.27 acres less than the Proposed Action. This figure excludes the existing disturbance from the facilities that would be used by AGC and the Notice-level disturbance.

### **3.3.13 Special Status Species**

Under the No Action Alternative, surface disturbance activities would impact up to 4.94 acres of potential special status species habitat. Impacts to habitat would be short term in nature, as the disturbed habitat would be reclaimed following exploration drilling activities. The likely special status species that have the potential to be directly impacted by the Notice-level activity include the BLM Sensitive bird species that have been observed at the site. However, the pre-construction disturbance surveys would prevent the direct impact to these species during nesting season. The impacts from the No Action Alternative would be similar but incrementally less than those associated with the Proposed Action, since the No Action Alternative would be disturbing 430.27 acres less than the Proposed Action. This figure excludes the existing disturbance from the facilities that would be used by AGC and the Notice-level disturbance.

### **3.3.14 Transportation**

Under the No Action Alternative, additional vehicles would not be utilizing SR 305, I-80, SR 766 or SR 205. Vehicle trips would be limited to those vehicles already accessing the site under the Notice-level exploration activities pursuant to Notice No. NVN-087927 and utilized in reclamation. Impacts to the transportation facilities under the No Action alternative would be less than under the Proposed Action, as the diamond drilling and bulk sampling would not occur. There would be fewer vehicles accessing the Project Area under the No Action Alternative, and vehicles would not be traveling to the Newmont Carlin Mill 6 or Jarrett Canyon sites.

### **3.3.15 Vegetation**

Under the No Action Alternative, surface disturbance activities would impact up to 4.94 acres of previously disturbed and reclaimed vegetation as opposed to 430.27 acres of new surface disturbance associated with the Proposed Action. The No Action Alternative would involve the construction of noncontiguous drill pads and drill access roads versus the construction of underground exploration support facilities. The drill disturbance would be recontoured and revegetated concurrently when feasible. Therefore, the disturbance to vegetation resources would be more short-term and less extensive in nature than the Proposed Action.

### **3.3.16 Visual Resources**

Under the No Action Alternative, no facilities or structures would be constructed and reclamation of the temporary disturbance from drill pads and roads would occur shortly after disturbance. The Project Area is already disturbed and altered from past mining activities, therefore, the No Action alternative would have no impact to visual resources based on this existing condition. The No Action Alternative would meet Class IV objectives.

### **3.3.17 Wastes, Hazardous or Solid**

The generation of wastes and the use of hazardous materials as a result of the No Action Alternative may result in the release of these wastes or materials. The No Action Alternative only involves surface exploration drilling and does not include the storage of hazardous or regulated materials. The source of spills or leaks would be from the drill rigs operating at the site. Therefore, the No Action Alternative has proportionally less potential for spills because the scale of activities is less than the Proposed Action.

### **3.3.18 Water Resources**

The No Action Alternative would result in the disturbance of up to 4.94 acres within the Project Area and with the use of BMPs to prevent erosion and sediment transport, would not result in impacts to water resources. Should the drill holes encounter ground water, they would be plugged in accordance with NAC 534.420.

### **3.3.19 Wildlife**

Under the No Action Alternative, the temporary loss of up to five acres of wildlife habitat would occur, as opposed to a maximum of 407.85 acres under the Proposed Action. The No Action Alternative would involve the construction of noncontiguous drill pads and drill access roads versus the construction of underground exploration support facilities. The drilling activities conducted under the No Action Alternative would be intermittent in nature, whereas the activities in the Proposed Action would create more noise and human activity that may disturb wildlife or cause wildlife to avoid the Project Area. Wildlife species, which are not mobile, would be lost as habitat is lost and mobile species may move into adjacent habitat.

## 4 CUMULATIVE IMPACT ANALYSIS

### 4.1 Introduction

For the purpose of this EA, the cumulative impacts are the sum of all past, present, and reasonably foreseeable future actions (RFFAs) resulting primarily from mining, commercial activities and public uses. The purpose of the cumulative analysis in the EA is to evaluate the significance of the Proposed Action's contributions to cumulative impacts. A cumulative impact is defined under federal regulations as follows:

"...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 individual minor but collectively significant actions taken place over a period of time" (40 CFR 1508.7).

As required under the NEPA and the regulations implementing the NEPA, this chapter addresses those cumulative effects on the environmental resources in the Cumulative Effects Study Areas (CESAs) that could result from the implementation of the Proposed Action and reasonable alternatives, past actions, present actions, and RFFAs. The extent of the CESA will vary by each resource, based on the geographic or biological limits of that resource. As a result, the list of projects considered under the cumulative analysis may vary according to the resource being considered. In addition, the length of time for cumulative effects analysis will vary according to the duration of impacts from the Proposed Action on the particular resource.

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 impacts analysis was accomplished through the following three steps:

Step 1: Identify, describe, and map CESAs for each resource to be evaluated in this chapter.

Step 2: Define timeframes, scenarios, and acreage estimates for cumulative impact analysis.

Step 3: Identify and quantify the location of possible specific impacts from the Proposed Action and judge the significance of these contributions to the overall impacts.

### 4.2 Cumulative Effects Study Areas

Environmental consequences of the Proposed Action were previously evaluated in Chapter 3 for the various environmental resources. Discussed in the following sections are the resources that have the potential to be cumulatively impacted by the Proposed Action within the identified CESA. The discussions are based upon the previous analysis of each environmental resource. Based on the preceding analysis, the Proposed Action would not impact the following resources and would therefore not have cumulative impacts: Cultural Resources; Fire Management; Lands and Realty; Native American Concerns and Tribal Consultation; Noxious Weeds, Invasive and Non-native Species; Paleontological Resources; Rangeland Management; Transportation and Access; Visual Resources; and Wastes (hazardous and solid). These resources are not discussed further in the cumulative impacts section.

The following nine elements or resources have been brought forward for cumulative impact analysis: Air Quality; Geology and Mineral Resources; Social and Economic Values; Migratory Birds; Special Status Species; Wildlife; Soils; Vegetation; and Water Resources. The geographic areas considered for further analysis of cumulative effects vary in size and shape to reflect each evaluated environmental resource and the potential area of impact to each from the Proposed Action as determined through the analysis in Chapter 3.

The Air Quality CESA was developed using a 50-kilometer buffer around the Project Area and the transportation routes. Since the impacts from the transportation of the ore material to milling sites is from truck emissions, only emission sources were considered in the cumulative analysis along the routes.

The Geology and Mineral Resources CESA is the Project Area as this is where all of the extraction of materials for bulk sampling and testing would occur.

The Social Values and Economics CESA is Lander County. This was chosen as the majority of the impacts would occur in Lander County as discussed in Chapter 3.

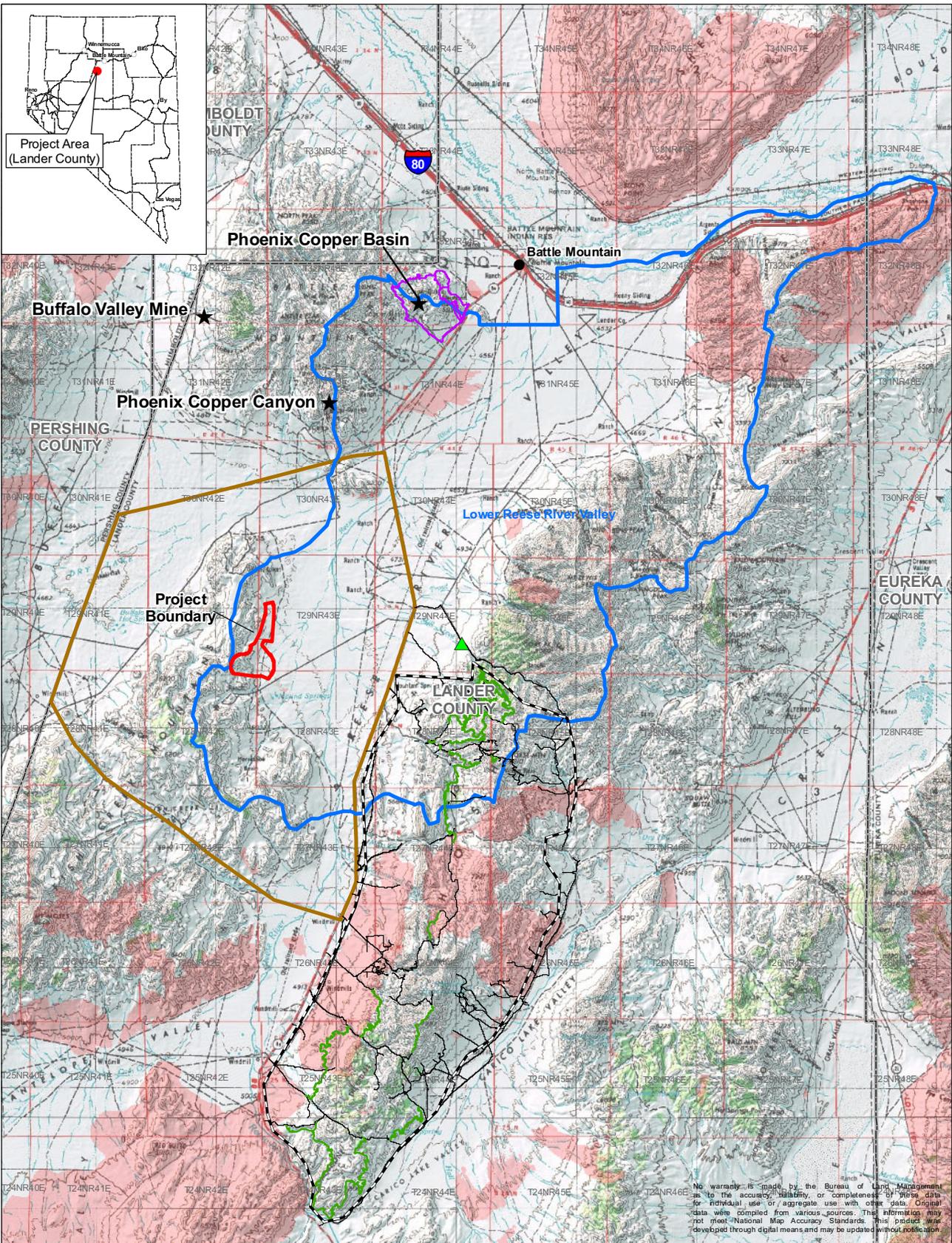
The BLM and NDOW developed the Wildlife CESA, which represents the local wildlife use area. This CESA boundary is used to analyze Migratory Birds, Special Status Species, and Wildlife.

For this cumulative impact analysis, the Lower Reese River Valley Hydrographic Basin is the CESA for Soils, Vegetation, and Water Resources. This determination was based on the location of the Project relative to the location and patterns of subsurface waters and aquifers, and the location and patterns of surface waters and drainages relative to the Project Area.

Table 4.2-1 describes each CESA area by resource. Figures 4.1.1, 4.1.2 and 4.1.3 show the CESA boundaries.

**Table 4.2-1: Cumulative Effects Study Areas**

Resources Analyzed	CESA	Description of CESA	Size of CESA (acres)
Air Quality	Air Quality CESA	50-kilometer buffer around Project Area and transportation routes to the two alternate processing facilities	7,333,627
Geology/Mineral Resources	Geology CESA	Project Area	2,474
Social and Economic Values	Social and Economic Values CESA	Lander County	3,529,614
Migratory Birds Special Status Species (including Bald and Golden Eagle) Wildlife	Wildlife CESA	Local wildlife use area	192,573
Soils Vegetation Water Resources	Watershed CESA	Lower Reese River Valley Hydrographic Basin	374,956



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**Explanation**

- ▭ Project Boundary
- ▭ Watershed CESA
- ▭ Wildlife CESA
- ▭ Fire History (1981 - 2008)
- ▭ Existing Roads Planned to Become Part of the Shoshone OHV Trail System
- ▭ Copper Basin Bike Trails
- ▭ Shoshone OHV Constructed Trails
- Shoshone OHV Trails System Boundary
- County

- ★ Existing Mine Project
- ▲ Millcreek Campground



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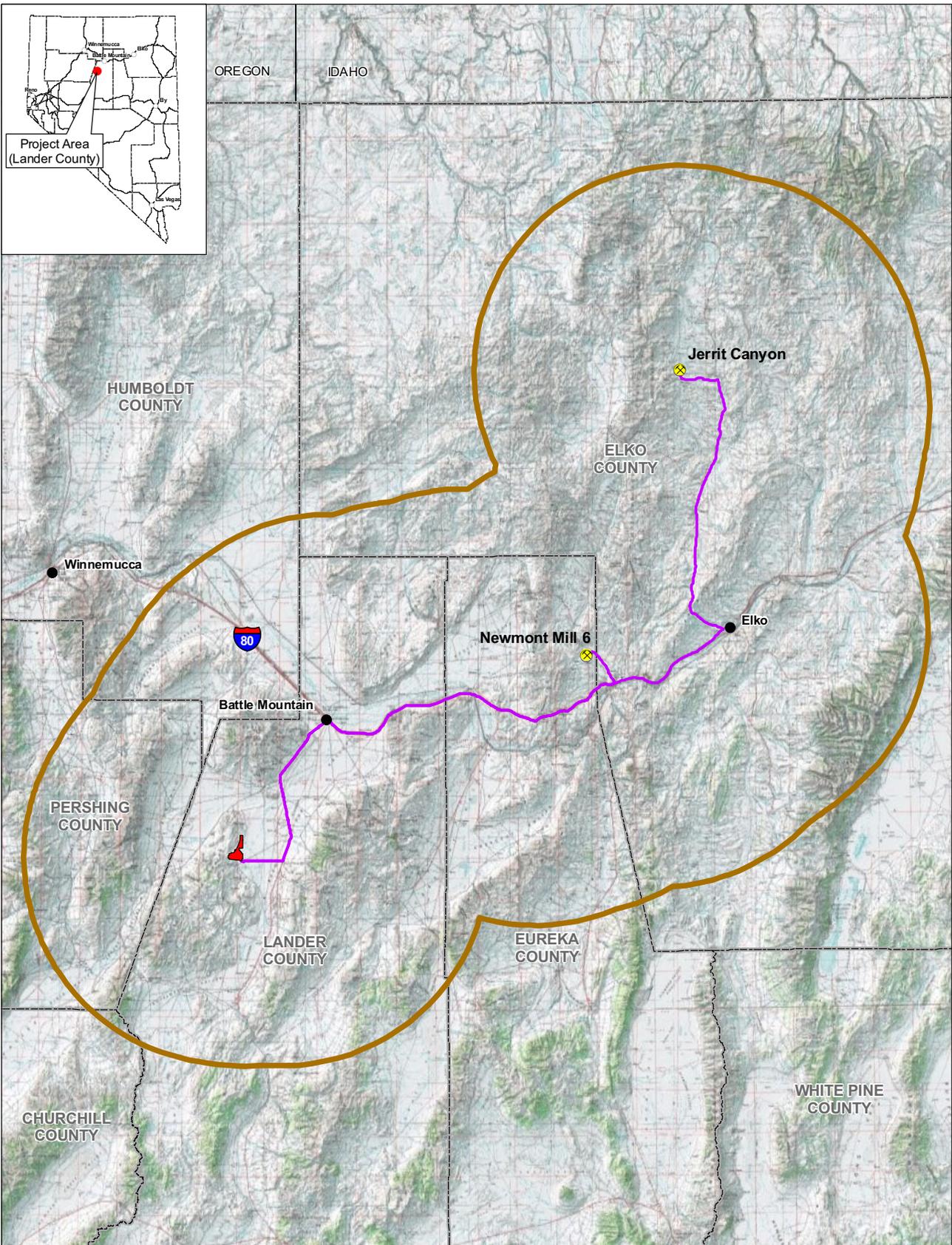
**BUREAU OF LAND MANAGEMENT**

**COVE-HELEN UNDERGROUND MINE PROJECT**

**CESA Map (Large Scale)**

**Figure 4.1.1**

01/16/2013



- Explanation**
- Project Boundary
  - Air Quality CESA
  - County
  - Truck Route
  - ⊗ Mill

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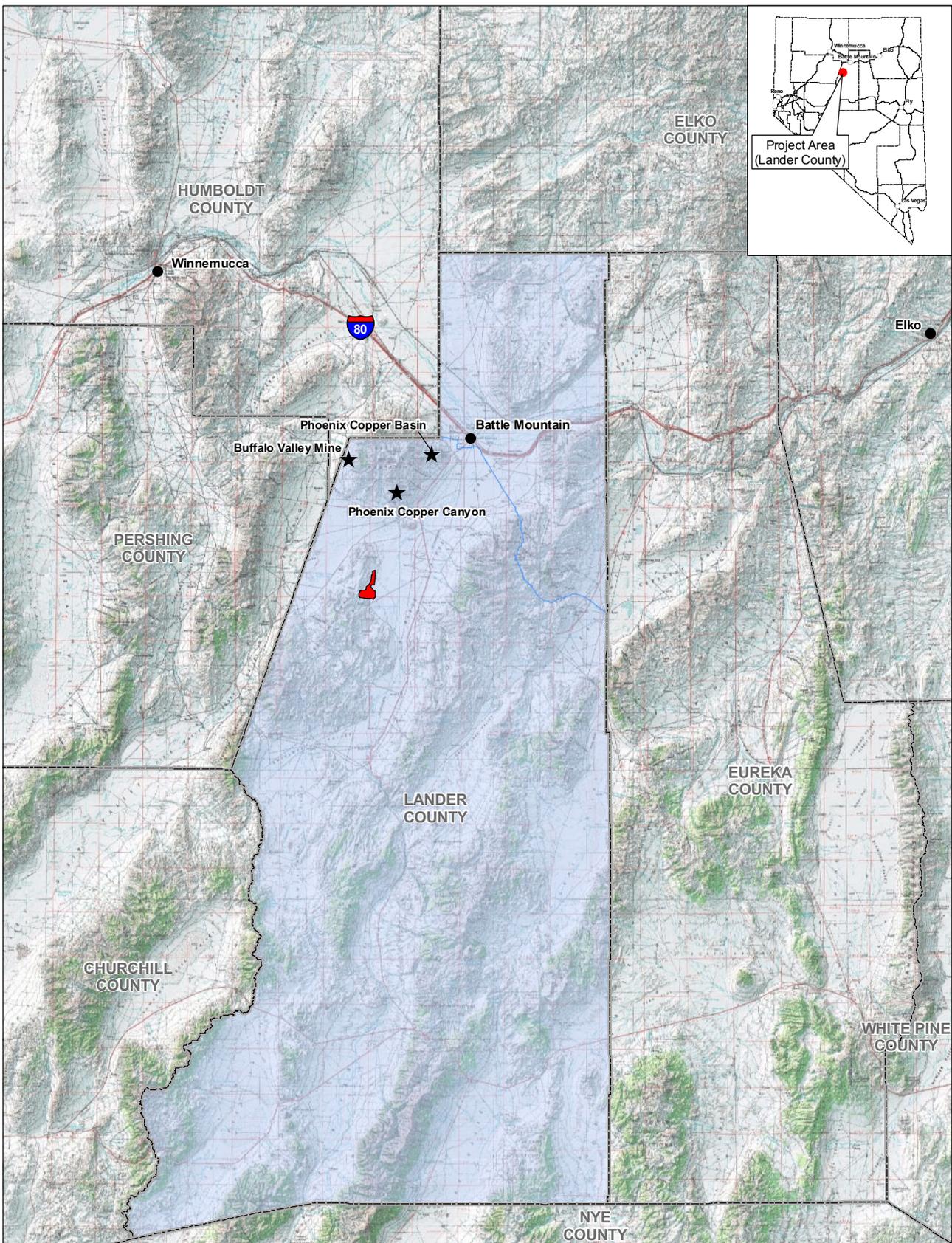
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**COVE-HELEN UNDERGROUND MINE PROJECT**

**Air Quality CESA**

**Figure 4.1.2**

01/17/2013



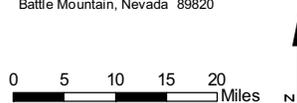
**Explanation**

- Project Boundary
- Socioeconomic Values CESA
- County

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**COVE-HELEN UNDERGROUND MINE PROJECT**

**CESA Map (Small Scale)**

**Figure 4.1.3**

01/17/2013

## 4.2.1 Past, Present, and Reasonably Foreseeable Future Actions

### 4.2.1.1 Past and Present Actions

Past and present actions in the two CESAs include the following: wildland fires; wildlife habitat management; utility and other ROWs; mineral exploration (including approved surface exploration within the Project Area); mining; and recreation.

#### *Wildland Fires*

Although there are no recorded wildland fires within the Project Area, there has been wildland fire disturbance within the Watershed CESA and the Wildlife CESA. The wildland fire disturbance in those CESAs is shown on Figure 4.1.1. Between 1981 and 2011, there were 29,093 acres of wildland fire disturbance in the Watershed CESA and 278 acres in the Wildlife CESA. The BLM has identified one BLM-managed fire within the northeast section of the Watershed CESA: the Airport fire, which encompassed 1,238 acres. The BLM-managed fires within the Wildlife CESA were the Daisy fire, the Echo fire, and another unnamed fire, and encompassed a total of 8,517 acres.

#### *Wildlife Habitat Management/Restoration/Hazardous Fuel Treatment*

Research and management of big game and wildlife are undertaken by the NDOW and the BLM which may include modification to existing habitat and rangeland facilities. Two restoration projects have been identified within the Watershed and Wildlife CESAs. The Airport reseeding project is located within the Watershed CESA and covers approximately 1,727 acres. The Fish Creek LA mowing project is located within the Wildlife CESA and covers approximately 146 acres.

The ongoing permit renewal for the North Buffalo and Copper Canyon Grazing allotments, known collectively as the Battle Mountain Complex, has been identified as an RFFA within the Watershed CESA. The environmental analysis for this permit renewal identified various alternatives for grazing management within the allotments. The Wildlife CESA contains the Copper Canyon, Buffalo Valley, and Carico Lake allotments.

#### *Rights-of-Way*

The LR2000 database that is maintained by the BLM was queried by Township and Range to show the past and present ROWs that have been approved within the two CESAs. These ROWs include the following: telecommunications; power transmission; roads and highways; oil and gas pipelines; communication sites; irrigation and water facilities; wind projects; mineral material disposal sites; and other ROWs. The approximate total acreage of existing and approved ROWs within each CESA is listed in Table 4.2-2. The exact acreage of surface disturbance associated with these ROWs cannot be quantified; however, it is assumed that these types of ROWs and the construction and maintenance associated with these facilities would create a level of surface disturbance that would contribute to cumulative impacts to various resources. In addition, certain types of ROWs can fragment habitat or create barriers or hazards for wildlife passage. The LR2000 database was queried on August 29, 2012, for the Watershed and Wildlife CESAs;

therefore, any newly approved ROWs that have been added to the LR2000 database after this date are not included in the analysis.

**Table 4.2-2 Past and Present Rights-of-Way Acres in the CESAs**

ROW Type	Wildlife CESA (acres)	Watershed CESA (acres)
Roads and Highways	1,103	1,924
Telecommunications	501	1,004
Power Transmission	1,866	1,558
Communication Sites	37	247
Oil and Gas Pipelines	277	277
Irrigation/Water Facilities and Pipelines	62	109
Mineral Material Disposal Sites	225	829
Wind Energy Facilities	0	13,798
Other	10	410
<b>Total</b>	<b>4,081</b>	<b>20,156</b>

*Mineral Exploration and Mining*

The LR2000 database was queried by Township and Range to show the past and present mineral exploration or mining activities (i.e., authorized Notices, closed Notices, and authorized and closed plans of operation) that have been issued within the two CESAs. Past and present mineral exploration and mining activities in the two CESAs include historic exploration and mining operations. Table 4.2-3 shows the results of the LR2000 query, in acres, of the exploration and mining activities within each CESA. The LR2000 database was queried on August 29, 2012 for the Watershed and Wildlife CESAs; therefore, any newly authorized Notices or plans of operation that have been added to the LR2000 database after this date are not included in the analysis. These activities include mineral exploration activities currently being conducted by AGC north of the Project Area at Windy Point that consists of authorization to disturb up to 4.75 acres. Newmont is conducting ongoing closure management activities inside and outside of the Project Area at the McCoy/Cove Mine. There are several other gold mines in proximity to the Project Area. The active Newmont Gold Corporation Phoenix Mine, currently in the process of being permitted for approximately 902 acres, is located approximately ten miles north of the Project Area as shown on Figure 4.1.1. The Independence Mine is adjacent to the Phoenix Mine and is currently in the process of being permitted for 25 acres. The Buffalo Valley Mine, as shown on Figure 4.1.1, is also currently in the process of being permitted for 189.86 acres.

Past mining operations also include copper and gold mining in the Copper Basin area southwest of Battle Mountain, the Hilltop Barite Mine east of Battle Mountain, the Hilltop Gold Mine, and the Betty O’Neal/Marysville Mine at Mount Lewis. All these past mining operations consumed ground water resources as part of their operations.

**Table 4.2-3: Past and Present Minerals Disturbance Acres in the CESAs**

CESA	Authorization Status	Total Acres of Disturbance
Wildlife CESA	Closed Notices (51)	80
	Authorized Notices (5)	15
	Authorized and Closed Plan of Operations (7)	9,178
	<b>Wildlife CESA Total</b>	<b>9,273</b>
Watershed CESA	Closed Notices (218)	465
	Authorized Notices (12)	34
	Authorized and Closed Plan of Operations (20)	11,693
	<b>Watershed CESA Total</b>	<b>12,192</b>

*Recreation*

Historical and present recreational activities that have occurred within the Wildlife and Watershed CESAs include hunting, fishing, camping, and other dispersed recreation activities. Within the Watershed CESA, there are approximately 9.4 miles of the Copper Basin Mountain Bike Trail and approximately 47.9 miles of constructed trails in the Shoshone Off-Highway Vehicle Trail System. The BLM-maintained Mill Creek Campground is also located in the Watershed CESA. The activities have the potential to impact wildlife habitat, water quality, and air quality. Figure 4.1.1 displays the trail systems.

4.2.1.2 Reasonably Foreseeable Future Actions

RFFAs in the Wildlife CESA include livestock grazing, wildland fires, wildlife and game habitat management, ROW maintenance, mineral exploration and mining including the Phoenix Copper Heap Leach Expansion Project and Buffalo Valley Mine Project, and recreation.

RFFAs in the Watershed CESA include livestock grazing, wildland fires, wildlife and game habitat management, ROW maintenance, mineral exploration and mining including the Phoenix Copper Heap Leach Expansion Project and Buffalo Valley Mine Project, and recreation.

**4.3 Evaluation of Potential Cumulative Impacts**

**4.3.1 Air Quality**

The CESA for air quality is the Air Quality CESA, which includes approximately 7,333,627 acres and is shown on Figure 4.1.2.

*Past and Present Actions:* Past and present actions that have had the potential to impact air quality include livestock grazing, fire management, mineral exploration and mining, ROW

construction and maintenance, and dispersed recreation that disturbed or impacted soils creating fugitive dust or that have had the potential to generate emissions. Soil disturbance may also have been associated with wildland fires; however, fire rehabilitation and natural revegetation have potentially occurred, stabilizing soil. There are approximately 138 miles of I-80 within the Air Quality CESA, as well as approximately 358 miles of paved or gravel roads and approximately 311 miles of unpaved or dirt roads within the CESA, that would have contributed to fugitive dust emissions by way of vehicle travel. The impacts associated with all past and present actions have had the potential to create surface disturbance and contribute to soil erosion and degradation of access roads leading to fugitive dust. However, most of these impacts are temporary in nature, ceasing when road travel and other activities stop.

*RFFAs:* Livestock grazing, wildland fire, ROW construction and maintenance, mineral exploration and mining, and dispersed recreation have the potential to continue to occur within the Air Quality CESA and have the potential to impact air quality. Some of these emissions would be localized and subject to NDEP BAPC air quality permits and compliance, development of mitigation measures, and implementation of environmental protection measures. Other emissions would be more long-term and basin-wide.

#### 4.3.1.1 Proposed Action

Impacts to air quality from the Proposed Action would be limited to particulate and combustion emissions and fugitive dust. The incremental contribution of the Proposed Action's particulate and combustion emissions and fugitive dust to the cumulative air quality environment would be relatively small compared to the existing cumulative air environment, and cumulative emissions are generally dispersed. Stationary sources would be regulated by the NDEP BAPC under individual permits to ensure that impacts would be reduced to levels that are consistent with the ambient air quality standards, including the permits for Jerritt Canyon (Air Quality Operating Permit Number AP1041-0778) and Newmont Carlin Mill #6 (Air Quality Operating Permit Number AP1041-0793). Environmental Protection Measures outlined in Section 2.1.12 help minimize the potential effects of fugitive dust on air quality.

#### 4.3.1.2 No Action Alternative

Under the No Action Alternative, incremental cumulative impacts to air quality within the CESA would result from past, present, and RFFAs; however, the incremental contribution of this alternative is less than the Proposed Action because there is less surface disturbance, and the transport of ore to the other facilities would not occur. The cumulative emissions are generally dispersed and the stationary sources would be regulated by the NDEP BAPC to ensure that impacts would be reduced to levels that are consistent with the ambient air quality standards.

### 4.3.2 **Geology/Mineral Resources**

The CESA for Geology/Mineral Resources is the Geology CESA, or the Project Area, which encompasses approximately 2,474 acres and is shown on Figure 4.1.1.

*Past and Present Actions:* Past and present actions that could have impacted geology and mineral resources include primarily mining-related actions. Most past mining operations within the CESA consisted of exploration and open pit mining activities. Present actions are surface mineral

exploration activities that affect geology and mineral resources by modifying or covering existing topographic and geomorphic features and by removing mineral resources. Quantifiable past and present surface disturbance from mining-related activities within the Geology CESA include approximately 42.65 acres.

*RFFAs:* Mineral exploration and mining activities are likely to continue within the Geology CESA.

#### 4.3.2.1 Proposed Action

The removal of up to a maximum of 120,000 tons of ore would be associated with the implementation of the Proposed Action. Cumulative impacts associated with the Proposed Action on geology and mineral resources would include the permanent removal of ore-grade material.

#### 4.3.2.2 No Action Alternative

Under the No Action Alternative, impacts to geology and mineral resources from the proposed underground mining activities would not occur. AGC would not extract the ore associated with the Proposed Action, which would leave valuable resources in the ground that would not be distributed to commerce. Only currently permitted surface exploration activities would continue to occur. Therefore, cumulative impacts to geology and mineral resources would be less under the No Action Alternative than under the Proposed Action.

### 4.3.3 **Migratory Birds**

The CESA for migratory birds is the Wildlife CESA, which includes approximately 192,573 acres and is shown on Figure 4.1.1.

*Past and Present Actions:* Past and present actions that could have impacted migratory birds include wildland fires, wildlife habitat management, utility and other ROWs, mineral exploration, mining, livestock grazing, and dispersed recreation. Impacts to migratory birds could have resulted from the following: 1) destruction of habitat associated with building roads and clearing vegetation; 2) disruption from human presence or noise from drill rigs, water trucks, and four wheel drive pickups; or 3) direct impacts or harm to migratory birds that would result if trees and shrubs containing viable nests were cut down or ground nests destroyed by construction or ranching equipment. Impacts to migratory birds from recreation activities would include destruction of native vegetation or nesting areas from off-road vehicles that traveled off established roadways. Impacts to migratory birds from livestock grazing include trampling of vegetation or nesting areas near streams, springs, or riparian areas within the Wildlife CESA.

Historic fires (1981–2011) have burned approximately 278 acres in this CESA (approximately 0.1 percent of the CESA). Authorized and closed mineral exploration and mining Notices and plans of operation total approximately 9,273 acres (approximately five percent of the CESA) of surface disturbance. Approximately 4,081 acres of ROWs were issued within the Wildlife CESA that had the potential to create surface disturbance and disturb migratory bird habitat and vegetation. The Wildlife CESA includes portions of the Copper Canyon, Buffalo Valley, and

Carico Lake grazing allotments. Livestock grazing and associated management contributes to the spread of invasive species which can have an indirect effect on migratory birds. However, disturbance to migratory birds from past and present actions would have been reduced through reclamation and seeding of disturbed areas and natural recolonization of native species. The past and present actions that are quantifiable have disturbed approximately seven percent of the CESA. There are no data on the number of acres reclaimed. State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have naturally revegetated over time.

*RFFAs:* Potential impacts to migratory birds from grazing, dispersed recreation, roads, ROWs, mineral activities, or loss of native vegetation associated with potential wildland fires could occur. There is no way to quantify acreage of potential impacts to migratory birds or their habitat within the CESA as a result of dispersed recreation, grazing, or potential wildland fires. There are no pending ROW projects reported in LR2000 in the Wildlife CESA. There are approximately 419.3 acres of pending minerals projects, which was the original acreage identified for the Project. All pending minerals projects are required to incorporate protection measures for migratory birds and therefore not expected to directly harm migratory birds, but may result in habitat removal or alteration.

#### 4.3.3.1 Proposed Action

Past and present actions and RFFA disturbance within the CESA is approximately 14,051 acres, which is an impact to approximately seven percent of the CESA (192,573 acres). The Proposed Action (465.32 acres) would impact approximately 0.2 percent of the CESA. Due to the small impact within the CESA, the impacts to migratory birds from the Proposed Action in combination with past and present actions and RFFAs would be minimal. Impacts would also be reduced with the planned reclamation described in Section 2.1.11 and the environmental protection measures outlined in Section 2.1.12. Based on the above analysis and findings, incremental impacts to migratory birds as a result of the Proposed Action, when compared with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### 4.3.3.2 No Action Alternative

A total of the past and present actions and RFFA disturbance within this CESA is approximately 14,051 acres, which is an impact to approximately seven percent of this CESA. This alternative (4.94 acres) would impact approximately 0.002 percent of this CESA. Due to the small impact within this CESA, the incremental cumulative impacts to migratory birds from this alternative in combination with past and present actions and RFFAs would be minimal.

#### **4.3.4 Socioeconomic Values**

The CESA for socioeconomic values is the Socioeconomic Values CESA, or Lander County, which encompasses approximately 3,529,614 acres and is shown on Figure 4.1.3.

*Past and Present Actions:* Past and present actions within the Socioeconomics CESA include the following: grazing and agriculture; utilities and infrastructure; wildland fires; recreation; and mineral development and exploration. Impacts to socioeconomics from these activities include

increased population, increased demand for public services, increased employment opportunities, increased revenues within the CESA, and increased expenditures by the communities within the CESA. The extent of these impacts vary with the type of activity and have not been quantified; however, the majority of these impacts from past and present activities do not have any ongoing impacts and are considered to be part of the existing social and economic climate within the CESA. Mining projects play an important role in the social and economic climate in the CESA, with employees traveling up to 50 miles from their residence to a potential job site. Some of the major mines and exploration projects within this 50-mile traveling radius include the following: the Pipeline/South Pipeline Pit Expansion; the Twin Creeks Mine; the Barrick Goldstrike Mine; the Marigold Mine; and the Genesis-Bluestar Mine.

*RFFAs:* Socioeconomic impacts would result from the following RFFAs: grazing and agriculture; utilities and infrastructure; wildland fires; recreation; and mineral development and exploration. Specific mineral development projects that are planned within the CESA include the Arturo Mine Project and the Buffalo Valley Mine Project.

#### 4.3.4.1 Proposed Action

The identified projects within the CESA, including the Proposed Action, would have an impact on socioeconomic values. The Proposed Action would employ up to approximately 27 individuals at any given time and a total of 37 individuals, and is expected to have a duration of approximately five years. Based on the short-term duration of the Project and the relatively small number of anticipated employees, and compared to the past and present actions and the RFFAs in the CESA, cumulative impacts from the Proposed Action are anticipated to be minimal.

#### 4.3.4.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be approved and ongoing mineral exploration activities in the Project Area would continue. Because the authorized operations would result in the need for fewer employees than the Proposed Action, the cumulative impacts resulting from the No Action Alternative would be less than those associated with the Proposed Action.

### 4.3.5 **Soils**

The CESA for soils is the Watershed CESA, or the Lower Reese River Valley Hydrographic Basin, which encompasses approximately 374,956 acres and is shown on Figure 4.1.1.

*Past and Present Actions:* Past and present actions that could have impacted soils include livestock grazing, fire management, mineral exploration and mining, ROW construction and maintenance, and dispersed recreation that disturbed or impacted soils, or that increased erosion or sedimentation. Soil disturbance may also have been associated with wildland fires; however, fire rehabilitation and natural revegetation have potentially occurred, stabilizing soil loss. Impacts from these activities include loss of soils productivity due to changes in soil physical properties, soil fertility, soil movement in response to water and wind erosion, and loss of soil structure due to compaction.

Historic fires (1981-2011) have burned approximately 29,093 acres in the Watershed CESA (approximately eight percent of the CESA). Authorized and closed mineral exploration and mining Notices and plans of operations total approximately 12,192 acres (approximately three percent of the CESA) of surface disturbance. As required by state and federal regulations some of the closed areas have been reclaimed, become naturally stabilized or have naturally revegetated over time. The Airport reseeded project is located within the Watershed CESA and covers approximately 1,727 acres. Approximately 20,156 acres of ROWs were issued within the Watershed CESA that had the potential to create surface disturbance. These activities have the potential to create surface disturbance and contribute to soil erosion and degradation of access roads.

*RFFAs:* Potential impacts to soils could result from grazing, dispersed recreation, roads, wildfires, ROWs, and minerals activities. There are approximately 8,325 acres of pending minerals projects and approximately 413 acres of pending ROW projects reported in LR2000 in the Watershed CESA. There are no specific data on the potential impacts to soils from dispersed recreation, grazing, vegetation improvement activities, or potential wildfires. Impacts associated with RFFAs would be similar to the impacts described for past and present actions.

#### 4.3.5.1 Proposed Action

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 70,179 acres, which is an impact to approximately 19 percent of the Watershed CESA (374,956 acres). The Proposed Action (465.32 acres) would impact 0.1 percent of the CESA. Surface disturbance would increase the potential for erosion of soils. Impacts would be reduced with the implementation of Environmental Protection Measures outlined in Section 2.1.12 and BMPs. Incremental impacts to soils from the Proposed Action, when combined with past and present actions and RFFAs, would be minimal.

#### 4.3.5.2 No Action Alternative

A total of the past and present actions and RFFA disturbance within this CESA is approximately 62,847 acres, which is an impact to approximately 17 percent of this CESA. This alternative (4.94 acres) would impact approximately 0.001 percent of this CESA. Due to the small impact within this CESA, the incremental cumulative impacts to soils from this alternative in combination with past and present actions and RFFAs would be minimal.

### 4.3.6 **Special Status Species**

The CESA for special status species is the Wildlife CESA, which includes approximately 192,573 acres and is shown on Figure 4.1.1.

*Past and Present Actions:* Past and present actions that could have impacted special status species include livestock grazing, fire management, mineral exploration, mining, ROW construction and maintenance, and dispersed recreation. These activities had the potential to have impacted water resources and wildlife habitat, or result in direct impacts to individuals in travel routes. Impacts to special status species from these activities include loss of forage, cover, and habitat, as well as disturbance of mating and brood rearing practices.

Historic fires (1981–2011) have burned approximately 278 acres in this CESA (approximately 0.1 percent of the CESA). Authorized and closed mineral exploration and mining Notices and plans of operation total approximately 9,273 acres (approximately five percent of the CESA) of surface disturbance. Approximately 4,081 acres of ROWs were issued within the Wildlife CESA that had the potential to create surface disturbance and disturb habitat for special status species and vegetation. The Wildlife CESA includes portions of the Copper Canyon, Buffalo Valley, and Carico Lake grazing allotments. However, disturbance to special status species from past and present actions would have been reduced through reclamation and seeding of disturbed areas and natural recolonization of native species. The past and present actions that are quantifiable have disturbed approximately seven percent of the CESA. There are no data on the number of acres reclaimed. State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have naturally revegetated over time. There are no specific data that quantify the acreage of impacts to special status species habitat that have resulted from grazing or dispersed recreation within the CESA. Disturbance to special status species habitat from past and present actions may have been reduced through reclamation and seeding of disturbed areas and natural recolonization of native species; however, reclamation activities did not necessarily always occur on old mine sites, resulting in continued impacts to special status species. The past and present actions that are quantifiable have disturbed approximately seven percent of the CESA.

*RFFAs:* Potential impacts to special status species from grazing, dispersed recreation, roads, ROWs, minerals activities or loss of native vegetation associated with potential wildland fires could occur. There is no way to quantify the potential impacts to sensitive species or their habitat as a result of dispersed recreation, grazing, or potential wildland fires. Impacts associated with RFFAs would be similar to impacts described for past and present actions. Approximately 1,375 acres of pending minerals projects were reported in the LR2000 database within the Wildlife CESA, and approximately 31 acres of pending ROW projects. There are no pending ROW projects reported in LR2000 in the Wildlife CESA. There are approximately 419.3 acres of pending minerals projects, which was the original acreage identified for the Project. Pending minerals projects all are required to incorporate protection measures and mitigation measures for special status species, which would reduce any cumulative impacts to special status species.

#### 4.3.6.1 Proposed Action

Past and present actions and RFFA disturbance within the CESA is approximately 14,051 acres, which is an impact to approximately seven percent of the CESA (192,573 acres). The Proposed Action (465.32 acres) would impact approximately 0.2 percent of the CESA. Due to the small impact within the CESA, the impacts to special status species from the Proposed Action in combination with past and present actions and RFFAs would be minimal. Impacts would also be reduced with the planned reclamation described in Section 2.1.11. Based on the above analysis and findings, incremental impacts to special status species as a result of the Proposed Action, when compared with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### 4.3.6.2 No Action Alternative

A total of the past and present actions and RFFA disturbance within this CESA is approximately 14,051 acres, which is an impact to approximately seven percent of this CESA. This alternative

(4.94 acres) would impact approximately 0.002 percent of this CESA. Due to the small impact within this CESA, the incremental cumulative impacts to special status species or their habitat from this alternative in combination with past and present actions and RFFAs would be minimal.

#### **4.3.7 Vegetation**

The CESA for vegetation is the Watershed CESA, or the Lower Reese River Valley Hydrographic Basin, which encompasses approximately 374,956 acres and is shown on Figure 4.1.1.

*Past and Present Actions:* Past actions that could have impacted vegetation include wildland fires, livestock grazing, mineral exploration and mining, ROW construction and maintenance, and recreation. One seeding project that restored the damaged area from the Airport fire was completed in the winter of 2000/2001.

Historic fires (1981–2008) have burned approximately 29,093 acres in this CESA (approximately eight percent of the CESA). Authorized and closed mineral exploration and mining Notices or Plans of Operation total approximately 12,192 acres of surface disturbance (approximately three percent of the CESA). State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have been naturally revegetated over time. Approximately 20,156 acres of ROWs were issued within the CESA that had the potential to create surface disturbance. The southern portion of the Watershed CESA is located within the northwestern portion of the Carico Lake Grazing Allotment, and livestock grazing and associated management likely contributes to changes in vegetation structure and the spread of invasive species.

*RFFAs:* Potential impacts to vegetation could result from grazing, dispersed recreation, roads, wildfires, ROWs, and mineral activities. Impacts associated with RFFAs would be similar to impacts described for past and present actions. Approximately 1,375 acres of pending minerals projects were reported in the LR2000 database within the Watershed CESA, and approximately 31 acres of pending ROW projects. Impacts to vegetation from the potential impacts from dispersed recreation, grazing, and wildland fires could include the removal of vegetation and compaction, mixing, and erosion of soils, and changes in plant community structure and diversity.

##### **4.3.7.1 Proposed Action**

Past and present actions and RFFA disturbance within the CESA is approximately 62,847 acres, which is an impact to approximately 17 percent of the CESA (374,956 acres). The Proposed Action (465.32 acres) would impact approximately 0.1 percent of the CESA. Due to the small impact within the CESA, the impacts to vegetation from the Proposed Action in combination with past and present actions and RFFAs would be minimal. Impacts would also be reduced with the planned reclamation described in Section 2.1.11 and the environmental protection measures outlined in Section 2.1.12.

#### 4.3.7.2 No Action Alternative

A total of the past and present actions and RFFA disturbance within this CESA is approximately 62,847 acres, which is an impact to approximately 17 percent of this CESA. This alternative (4.94 acres) would impact approximately 0.001 percent of this CESA. Due to the small impact within this CESA, the incremental cumulative impacts to vegetation from this alternative in combination with past and present actions and RFFAs would be minimal.

#### 4.3.8 **Water Resources**

The CESA for water resources is the Watershed CESA, or the Lower Reese River Valley Hydrographic Basin, which encompasses approximately 374,956 acres and is shown on Figure 4.1.1.

*Past and Present Actions:* Past actions that could have impacted water resources include livestock grazing, mineral exploration and mining, ROW construction and maintenance, by the consumption of the resources by livestock, mining activities, and dust abatement activities for the construction and maintenance of ROWs. The airport reseeded project aided in soil stabilization, which lessened impacts to surface water resources by promoting water infiltration into the soil, thereby reducing soil erosion from the overland flow of water. Ground water uses in the basin include pumping for commercial, domestic and municipal use, mining and milling, agricultural uses, and livestock watering. According to the NDWR, the Lower Reese River Valley has a sustained yield of approximately 20,000 af/yr (NDWR 2011). Table 4.2-4 shows the distribution of water rights within the basin by manner of use.

**Table 4.3-1: Water Rights by Manner of Use**

<b>Manner of Use</b>	<b>Active Annual Duty (af/yr)</b>
Commercial	2.17
Domestic	5.72
Industrial	400.07
Irrigation	15,764.44
Mining and Milling	18,234.16
Municipal	2,895.81
Quasi-municipal	16.38
Stock water	130.06
<b>Total</b>	<b>37,449.03</b>

Historic fires (1981–2008) have burned approximately 29,093 acres in this CESA (approximately eight percent of the CESA) eliminated vegetation and most likely contributed to soil erosion. Approved and closed mineral exploration and mining Notices or plans of operation total approximately 20,156 acres of surface disturbance (approximately five percent of the CESA) and some of the mining projects may have dewatering activities. State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have been naturally revegetated over time. Approximately 20,156 acres of ROWs were issued within the CESA that had the potential to create surface disturbance and lead to increased sedimentation to surface water features. The southern portion of the Watershed CESA is located within the northwestern portion of the Carico Lake Grazing Allotment, and abusive livestock grazing and associated management, which denudes the landscape of vegetative cover, may have contributed to soil erosion and sedimentation of waterways.

*RFFAs:* Potential impacts to water resources could result from grazing, roads, wildfires, ROWs, and mineral activities. Impacts associated with RFFAs would be similar to impacts described for past and present actions. Approximately 1,375 acres of pending minerals projects were reported in the LR2000 database within the Watershed CESA, and approximately 31 acres of pending ROW projects. Continued ground water use in the basin for commercial, domestic and municipal use, mining and milling, agricultural uses, and livestock watering would continue in the basin.

#### 4.3.8.1 Proposed Action

Past and present actions and RFFA disturbance within the CESA is approximately 62,847 acres, which is an impact to approximately 17 percent of the CESA (374,956 acres). The Proposed Action (465.32 acres) would impact approximately 0.1 percent of the CESA. The past and present actions and RFFA could have an observable impact to the CESA, since they comprise approximately 17 percent of the CESA. Impacts could be increases in surface runoff and soil erosion, which would affect overall water quality. The Proposed Action comprises a small percentage of the CESA. When the potential impacts from the Proposed Action are compared to the potential impacts from the past and present actions and RFFA disturbance, the impacts from the Proposed Action would be minimal. The addition of the impacts from the Proposed Action to the past and present actions and RFFA would minimally increase the cumulative impacts because the total disturbance area would increase from 17 percent to 17.1 percent.

AGC has a water right to extract 35 ac-ft of water from the Cove Pit Lake for Project operations, some of which would be discharged into the RIBs and recharge the aquifer. It is estimated that ground water inflow into the decline would measure approximately 800 gpm and 1,200 gpm annually. Since the majority of this water would be piped into infiltration basins, it would not affect basin yield values. Therefore, the past and present and RFFA actions when combined to the Proposed Action, would not have an incremental cumulative impact on surface or ground water resources.

#### 4.3.8.2 No Action Alternative

A total of the past and present actions and RFFA disturbance within this CESA is approximately 62,847 acres, which is an impact to approximately 17 percent of this CESA. This alternative

(4.94 acres) would impact approximately 0.001 percent of this CESA. Due to the small impact within this CESA, the impacts to water resources from this alternative in combination with past and present actions and RFFAs would be minimal.

### **4.3.9 Wildlife**

The CESA for wildlife is the local wildlife use area, which encompasses approximately 192,573 acres and is shown on Figure 4.1.1.

*Past and Present Actions:* Past and present actions that are likely to have impacts to wildlife include livestock grazing, fire management, mineral exploration, mining, ROW construction and maintenance, oil and gas development and dispersed recreation. These activities are likely to have impacts to wildlife habitat, or result in direct impacts to individuals in travel routes. Impacts to wildlife and game animals from these activities include loss of forage, cover, and habitat as well as disturbance of mating and brood rearing practices. The greatest impact would be from off-road use that remove habitat. Two seeding projects that restored fire damaged areas would have enhanced wildlife habitat in this CESA.

Historic fires (1981–2008) have burned approximately 278 acres in the Wildlife CESA (approximately 0.1 percent of the CESA). Authorized and closed mineral exploration and mining Notices or plans of operation total 9,273 acres of surface disturbance (approximately five percent of the CESA). State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have naturally revegetated over time. Approximately 4,081 acres of ROWs were issued within the Wildlife CESA that had the potential to create surface disturbance and disturb habitat and vegetation. However, disturbance to wildlife and game species from past and present actions would have been reduced through reclamation and seeding of disturbed areas and natural recolonization of native species.

*RFFAs:* Potential impacts to wildlife from grazing, recreation, roads, ROWs, mineral activities or loss of native vegetation associated with potential wildland fires could occur. There are no specific data on the potential impacts to wildlife species or their habitat as a result of recreation, grazing, or potential wildland fires. Approximately 419 acres of pending minerals projects were reported in the LR2000 database within the Wildlife CESA. These pending minerals projects are all required to incorporate environmental protection measures for wildlife.

#### **4.3.9.1 Proposed Action**

Past and present actions and RFFA disturbance within the Wildlife CESA is 14,051 acres, which is an impact to approximately seven percent of the Wildlife CESA (192,573 acres). The Proposed Action (465.32 acres) would impact approximately 0.3 percent of the CESA. Due to the small impact within the Wildlife CESA, the incremental cumulative impacts to wildlife or their habitat from the Proposed Action, in combination with past and present actions and RFFAs would be minimal. Impacts to wildlife from noise sources may occur, but would be temporary. Impacts would also be reduced with the reclamation plan described in Section 2.1.9 and the environmental protection measures outlined in Section 2.1.12.

#### 4.3.9.2 No Action Alternative

A total of the past and present actions and RFFA disturbance within this CESA is approximately 14,051 acres, which is an impact to approximately seven percent of this CESA. This alternative (4.94 acres) would impact approximately 0.002 percent of this CESA. Due to the small impact within this CESA, the incremental cumulative impacts to wildlife from this alternative in combination with past and present actions and RFFAs would be minimal.

## 5 CONSULTATION AND COORDINATION

This EA was prepared at the direction of the BLM, MLFO, Battle Mountain District, Nevada, by Enviroscientists, Inc., under a contract with AGC. The following is a list of persons, groups, and agencies consulted, as well as a list of individual responsible for the preparation of this EA.

### 5.1 Persons, Groups, and Agencies Consulted

#### Federal Agencies

Marcy Haworth (for Catrina Martin), United States Fish and Wildlife Service

#### State Agencies

Eric Miskow, Nevada Natural Heritage Program  
Timothy Herrick, Nevada Department of Wildlife  
Katie Miller, Nevada Department of Wildlife  
Todd Suessmith, Nevada Division of Environmental Protection, Bureau of Mining Regulation & Reclamation

#### Native Americans

Te-Moak Tribe of Western Shoshone  
Te-Moak Tribe of Western Shoshone, Battle Mountain Band Council  
Yomba Shoshone Tribe  
Duckwater Shoshone Tribe

### 5.2 List of Preparers and Reviewers

#### Bureau of Land Management, MLFO

Joseph Moskiewicz	Minerals Project Lead, Geology and Minerals, Native American Consultation/Coordination
Andrea Dolbear	NEPA Compliance
Tessa Teems	Planning and Environmental Coordinator, Environmental Justice, Social Values and Economics
Michael Wissenbach	Planning and Environmental Coordinator
David Djikine	Mining Engineer
Jon Sherve	Geology, Minerals, Hydrology
Cheryl LaRoque	Wastes, Hazardous and Solid
Casey Johnson	Rangeland Management, Vegetation, Soils, Noxious Weeds, Invasive and Nonnative Species
Kent Bloomer	Noxious Weeds, Invasive and Nonnative Species
Larry Turner	Mining Engineer
Chuck Lane	Lands and Realty
Chris Kula	Wildlife, Migratory Birds, Special Status Species
Ryan Sandefur	Wildlife, Migratory Birds, Special Status Species
Teresa Dixon	Cultural Resources
Alden Shallcross	Floodplains, Wetlands, Riparian
Dorothy Harvey	Public Outreach

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Kathy Graham            GIS Specialist

Bureau of Land Management, Nevada State Office

Tom Olsen                Water Quality and Quantity, Hydrogeology, Geochemistry

Bureau of Land Management, National Operations Center

Craig Nicholls           Air Quality

Enviroscientists, Inc.

Opal Adams              Project Principal

Melissa Sherman        Project Manager, Air and Atmospheric Resources, Migratory Birds,  
Special Status Species, Vegetation, Water Resources

Catherine Lee           Cultural Resources, Fire Management, Land Use and Realty, Native  
American Religious Concerns, Noxious Weeds, Invasive and Nonnative  
Species, Rangeland Management, Socioeconomic Values, Visual  
Resources, Wastes, Solid or Hazardous

Audra Miller             Transportation and Access

Kaitlin Sweet            Geology and Mineral Resources, Paleontological Resources, Soils

Gail Liebler              GIS Specialist

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**APPENDIX A**  
**BLM Sensitive Species Potential to Occur**

**APPENDIX A**  
**COVE HELEN UNDERGROUND MINE PROJECT**  
**BATTLE MOUNTAIN DISTRICT SENSITIVE SPECIES**

Species	Potential to Occur (Yes or No)
<i>Asclepias eastwoodiana</i> Eastwood milkweed	No
<i>Astragalus cimae</i> var. <i>cimae</i> Cima milkvetch	No
<i>Astragalus pseudiodanthus</i> Tonopah milkvetch	No
<i>Astragalus toquimanus</i> Toquima milkvetch	No
<i>Astragalus uncialis</i> Currant milkvetch	No
<i>Boechea falcifructa</i> Elko rockcress	No
<i>Castilleja salsuginosa</i> Monte Neva paintbrush	No
<i>Cordylanthus tecopensis</i> Tecopa birdbeak	No
<i>Cymopterus goodrichii</i> Goodrich biscuitroot	No
<i>Epilobium nevadense</i> Nevada willowherb	No
<i>Eriogonum anemophilum</i> Windloving buckwheat	Yes
<i>Eriogonum beatleyae</i> Beatley buckwheat	No
<i>Eriogonum tiehmii</i> Tiehm buckwheat	No
<i>Grusonia pulchella</i> Sand cholla	Yes
<i>Johanneshowellia crateriorum</i> Lunar crater buckwheat	No
<i>Lupinus holmgrenianus</i> Holmgren lupine	No
<i>Parthenium ligulatum</i> Low feverfew	No
<i>Penstemon pahutensis</i> Pahute Mesa beardtongue	No
<i>Penstemon palmeri</i> var. <i>macranthus</i> Lahontan beardtongue	No
<i>Penstemon pudicus</i> Bashful beardtongue	No
<i>Penstemon tiehmii</i> Tiehm beardtongue	No
<i>Phacelia filiae</i> Clarke phacelia	No
<i>Polycytenium williamsiae</i> Williams combleaf	No
<i>Sclerocactus blainei</i> Blaine pincushion	No
<i>Sclerocactus nyensis</i> Tonopah pincushion	No

Species	Potential to Occur (Yes or No)
<i>Sphaeralcea caespitosa</i> var. <i>williamsiae</i> Railroad Valley globemallow	No
<i>Tonestus graniticus</i> Lone Mountain goldenhead	No
<i>Accipiter gentilis</i> Northern goshawk	No
<i>Aquila chrysaetos</i> Golden eagle	Yes
<i>Athene cunicularia hypugaea</i> Western burrowing owl	Yes
<i>Buteo regalis</i> Ferruginous hawk	Yes
<i>Buteo swainsonii</i> Swainson's hawk	Yes
<i>Centrocercus urophasianus</i> Greater sage-grouse	Yes
<i>Charadrius alexandrinus nivosus</i> Western snowy plover	No
<i>Empidonax traillii</i> Southwestern Willowflycatcher	No
<i>Falco mexicanus</i> Prairie falcon	Yes
<i>Falco peregrines</i> Peregrine falcon	No
<i>Gymnorhinus cyanocephalus</i> Pinyon jay	No
<i>Haliaeetus leucocephalus</i> Bald eagle	No
<i>Lanius ludovicianus</i> Loggerhead shrike	Yes
<i>Leucosticte atrata</i> Black rosy-finch	No
<i>Melanerpes lewis</i> Lewis woodpecker	No
<i>Oreoscoptes montanus</i> Sage thrasher	Yes
<i>Spizella breweri</i> Brewer's sparrow	Yes
<i>Antrozous pallidus</i> Pallid bat	Yes
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	No
<i>Eptesicus fuscus</i> Big brown bat	No
<i>Euderma maculate</i> Spotted bat	No
<i>Lasiorycteris noctivagans</i> Silver-haired bat	No
<i>Lasiurus cinereus</i> Hoary bat	No
<i>Lasiurus blossevillii</i> Western red bat	No

Species	Potential to Occur (Yes or No)
<i>Myotis ciliolabrum</i> Western small-footed myotis	Yes
<i>Myotis californicus</i> California myotis	Yes
<i>Myotis evotis</i> Long-eared myotis	No
<i>Myotis lucifugus</i> Little brown myotis	Yes
<i>Myotis thysanodes</i> Fringed myotis	No
<i>Myotis volans</i> Long-legged myotis	No
<i>Pipistrellus Hesperus</i> Western pipistrelle	No
<i>Tadarida brasiliensis</i> Brazilian free-tailed bat	No
<i>Brachylagus idahoensis</i> Pygmy rabbit	No
<i>Microdipodops megacephalus</i> Dark kangaroo mouse	Yes
<i>Microdipodops pallidus</i> Pale kangaroo mouse	Yes
<i>Ochotona princeps</i> American pika	No
<i>Ovis canadensis</i> Bighorn sheep	No
<i>Thomomys bottae abstusus</i> Fish springs pocket gopher	No
<i>Thomomys bottae curatus</i> San Antonio pocket gopher	No
<i>Bufo nelson</i> Amagosa toad	No
<i>Rana luteiventis</i> Colombia spotted frog	No
<i>Crenichthys nevadae</i> Railroad Valley springfish	No
<i>Gila bicolor</i> ssp. 4 Fish Lake Valley tui chub	No
<i>Gila bicolor</i> ssp. 5 Hot Creek Valley tui chub	No
<i>Gila bicolor</i> ssp. 7 Hot Creek Valley tui chub	No
<i>Oncorhynchus clarki henshawi</i> Lahontan cutthroat trout	No
<i>Rhinichthys osculus</i> spp 5 Monitor Valley speckled dace	No