Bald Mountain Mine

North and South
Operations Area Projects
Environmental Impact Statement
Volume II – Section 3.14 through Appendices
Draft

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White Pine County Commission

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BLM

Ely District – Egan Field Office, Nevada

BLM Mission Statement

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

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Contents

VOLUME II

3.14 Air Quality ... 3.14-1
3.14.1 Affected Environment ... 3.14-1
3.14.2 Environmental Consequences ... 3.14-8
3.15 Land Use and Access ... 3.15-1
3.15.1 Affected Environment ... 3.15-1
3.15.2 Environmental Consequences ... 3.15-5
3.16 Recreation ... 3.16-1
3.16.1 Affected Environment ... 3.16-1
3.16.2 Environmental Consequences ... 3.16-4
3.17 Social and Economic Values ... 3.17-1
3.17.1 Affected Environment ... 3.17-1
3.17.2 Environmental Consequences ... 3.17-16
3.18 Environmental Justice ... 3.18-1
3.18.1 Affected Environment ... 3.18-1
3.18.2 Environmental Consequences ... 3.18-2
3.19 Visual Resources ... 3.19-1
3.19.1 Affected Environment ... 3.19-1
3.19.2 Environmental Consequences ... 3.19-10
3.20 Hazardous Materials and Solid Waste ... 3.20-1
3.20.1 Affected Environment ... 3.20-1
3.20.2 Environmental Consequences ... 3.20-4
3.21 Relationship between Short-term Uses of the Human Environment and the Maintenance and Enhancement of Long-term Productivity ... 3.21-1
3.22 Irreversible and Irretrievable Commitment of Resources ... 3.22-1
3.23 Energy Requirements and Greenhouse Gas Emissions ... 3.23-1
3.23.1 Regulatory Framework ... 3.23-1
3.23.2 Applicability of Greenhouse Gas Emissions and Climate Change to the Proposed Project ... 3.23-2
3.23.3 Energy Consumption and Greenhouse Gas Emissions for the Proposed Action, Reconfiguration Alternative, and WRM Alternative ... 3.23-2
3.23.4 Cumulative Impacts ... 3.23-3
3.23.5 Monitoring and Mitigation Measures ... 3.23-3
3.23.6 Residual Impacts ... 3.23-3

4.0 Consultation and Coordination ... 4-1

4.1 Public Participation ... 4-1
4.1.1 Scoping ... 4-1
4.1.2 Public Review of the Draft EIS ... 4-2

4.2 Consultation and Coordination with Federal, State and Local Agencies 4-2
4.3 Consultation with Tribes 4-3
4.4 List of Agency, Tribal, and Private Organization Contacts 4-3
4.4.1 Federal Agencies 4-4
4.4.2 State Agencies 4-4
4.4.3 Local Agencies 4-4
4.4.4 Tribal Organizations 4-4
4.4.5 Private Organizations and Companies 4-4

5.0 List of Preparers and Reviewers 5-1

6.0 References 6-1

7.0 Glossary and Index 7-1

List of Appendices

Appendix A - Detailed Conceptual Schedule for Reclamation, Closure, and Post-closure

Appendix A1 - Proposed Action - Conceptual Reclamation Schedule for the North Operations Area Project
Appendix A2 - Proposed Action - Conceptual Reclamation Schedule for the South Operations Area Project
Appendix A3 - North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the North Operations Area Project
Appendix A4 - North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the South Operations Area Project
Appendix A5 - North and South Operations Area Facilities WRM Alternative – Conceptual Reclamation Schedule for the North Operations Area Project
Appendix A6 - North and South Operations Area Facilities WRM Alternative – Conceptual Reclamation Schedule for the South Operations Area Project

Appendix B - Water Quality

Table B-1 Seep and Spring Inventory

Table B-2 Water Rights Inventory

Table B-3 Values for General Water Quality Constituents at Monitored Locations

Table B-4 Total Metals Ranges at Monitored Locations

Table B-5 Summary of Humidity Cell Test Results

Appendix C - Soils with Salvage Depths within the Study Area

Appendix D - Inventory of Migratory and Resident Bird Species Potentially Occurring within the Study Area

Appendix E - Mule Deer Monitoring Plan

Appendix F - Special Status Species Identified for the Proposed Project

Appendix G - Visual Resources

Appendix G1 - Visual Simulations
Appendix G2 - Contrast Rating Forms

Appendix H - Programmatic Agreement Regarding the Bald Mountain Mining District Project

Appendix I - Memorandum of Understanding Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat

List of Tables

VOLUME II

Table 3.14-1 National and Nevada Ambient Air Quality Standards 3.14-1
Table 3.14-2 Background Concentrations 3.14-5
Table 3.14-3 Monthly Climate Summary 3.14-6
Table 3.14-4 Comparison of Pan-evaporation Rates at Selected Nevada Sites 3.14-8
Table 3.14-5 Facility-wide Potential Emissions from the Proposed Action by Source Category 3.14-10
Table 3.14-6 Highest Modeled Air Pollutant Concentrations from the Proposed Action 3.14-11
Table 3.14-7 Facility-wide Potential Emissions by Pollutant 3.14-12
Table 3.15-1 Land Management or Ownership within the Study Area 3.15-1
Table 3.15-2 Traffic within the Study Area (Average Annual Daily Traffic) 3.15-4
Table 3.17-1 Population Characteristics 3.17-1
Table 3.17-2 Race and Ethnicity by County 3.17-3
Table 3.17-3 Non-agricultural Wage and Salary Employment by Sector in 2012 .... 3.17-5
Table 3.17-4 Housing Vacancy Rates in 2010 .... 3.17-7
Table 3.17-5 Public Schools Enrollment History 3.17-10
Table 3.17-6 County Budgets for Fiscal Year 2012-2013 .... 3.17-13
Table 3.17-7 City and Town Budgets for Fiscal Year 2012-2013 .... 3.17-14
Table 3.17-8 Employment Estimates 3.17-17
Table 3.17-9 Proposed Action New Project-related Employment, Households, and Population Projections (2015-2024 Average) 3.17-20
Table 3.17-10 Proposed Action – New Project-related Employment, Households, and Population Projections (2015-2024 Peak) 3.17-21
Table 3.17-11 Employment Estimates for the North and South Operations Area Facilities Reconfiguration Alternative 3.17-26
Table 3.18-1 Race and Ethnicity by County within the Study Area 3.18-2
Table 3.18-2 Per Capita Personal Income – Nevada and Counties 3.18-3
Table 3.19-1 Visual Resource Inventory Summary 3.19-3
Table 3.19-2 BLM Visual Resource Management Class Objectives 3.19-8
Table 3.20-1 North Operations Area Project Potential of Hazardous Material Transportation Incidents 3.20-5
Table 3.20-2 South Operations Area Project Potential of Hazardous Material Transportation Incidents 3.20-6
Table 3.22-1 Irreversible and Irretrievable Commitment of Resources by the Proposed Action, Reconfiguration Alternative, and WRM Alternative 3.22-2
Table 3.23-1 Greenhouse Gas Emissions under the Proposed Action 3.23-3

Table 5-1 List of Preparers and Technical Specialists 5-1
Table 5-2 AECOM (Third-party Contractor).. 5-3

List of Figures

VOLUME II

Figure 3.15-1 Land Use and Access Study Area and Cumulative Effects Study Area 3.15-2
Figure 3.16-1 Recreation Study Area and Cumulative Effects Study Area 3.16-2
Figure 3.16-2 Recreation Areas Adjacent to the Study Area... 3.16-3
Figure 3.17-1 Social and Economic Values and Environmental Justice Study Area and Cumulative Effects Study Area 3.17-2
Figure 3.19-1 Visual Resources Study Area and Cumulative Effects Study Area 3.19-2
Figure 3.19-2 Visual Resource Inventory Scenic Quality Classifications....................................... 3.19-4
Figure 3.19-3 Visual Resource Inventory Sensitivity Level Analysis... 3.19-5
Figure 3.19-4 Visual Resource Inventory Distance Zones 3.19-6
Figure 3.19-5 Visual Resource Inventory Classes.. 3.19-7
Figure 3.19-6 Visual Resource Management Classes 3.19-9
Figure 3.20-1 Hazardous Materials and Solid Waste Study Area and Cumulative Effects Study Area.. 3.20-2

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3.14 Air Quality

The study area for air quality includes the proposed NOA and SOA plan boundaries. The CESA for air quality encompasses the proposed NOA and SOA projects and its corresponding local airshed defined by the Huntington Valley, Newark Valley, Long Valley, and Ruby Valley hydrographic basins. **Figure 3.3-1** illustrates the study area and CESA for air quality. The cumulative impact analysis also includes a discussion of potential visibility impacts to Class I areas located within 200 km of the proposed NOA and SOA projects.

3.14.1 Affected Environment

3.14.1.1 Regulatory Framework

Clean Air Act

The Clean Air Act (CAA), and the subsequent Federal Clean Air Act Amendments of 1990 (CAAA), require the USEPA to identify NAAQS to protect public health and welfare. The CAA and the CAAA established NAAQS for pollutants known as "criteria" pollutants. The ambient standards set for these pollutants satisfy "criteria" specified in the CAA. A list of the criteria pollutants regulated under the CAA and their currently applicable NAAQS set by the USEPA, as revised in 2013, are listed in **Table 3.14-1**.

Air quality is defined by the concentration of various pollutants and their interactions in the atmosphere. Pollution effects on receptors have been used to establish a definition of air quality. Measurement of pollutants in the atmosphere is expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). Both long-term climatic factors and short-term weather fluctuations are considered part of the air quality resource because they control dispersion and affect concentrations. Physical effects of air quality depend on the characteristics of the receptors (i.e., location, elevation, and impacts of aerodynamic disturbances), and the type, amount, and duration of exposure. Air quality standards specify acceptable upper limits of pollutant concentrations, averaged over specified intervals. Air pollutant concentrations within the standards generally are not considered to be detrimental to public health and welfare.

The relative importance of pollutant concentrations can be determined by comparison with appropriate NAAQS and state Ambient Air Quality Standards (AAQS) (**Table 3.14-1**). An area is designated by the USEPA as being in attainment for a pollutant if ambient concentrations of that pollutant are below the NAAQS. An area is not in attainment if violations of NAAQS for that pollutant occur. Areas where insufficient data are available to make an attainment status designation are listed as unclassifiable and are treated as being in attainment for regulatory purposes.

Table 3.14-1 National and Nevada Ambient Air Quality Standards

Nevada Standards			National Standards	
Pollutant	**Averaging Time**	**Concentration[1]**	**Primary[1]**	**Secondary[1]**
Ozone (O_3)	8-Hour	0.075 ppm	0.075 ppm	0.075 ppm
Carbon Monoxide (CO)	1-Hour	40,000	40,000	40,000
CO less than 5,000 feet amsl	8-Hour	10,500	10,000	10,000
CO at or greater than 5,000 feet amsl	8-Hour	7,000		

Table 3.14-1 National and Nevada Ambient Air Quality Standards

Nevada Standards			National Standards	
Pollutant	**Averaging Time**	**Concentration[1]**	**Primary[1]**	**Secondary[1]**
Sulfur Dioxide (SO_2)	1-Hour	N/A	197	N/A
	3-Hour	1300	N/A	1,300
	24-Hour	365	N/A	N/A
	Annual Average	80	N/A	N/A
Nitrogen Dioxide (NO_2)	1-Hour[2]	N/A	188	N/A
	Annual Average	100	100	100
Particulate matter with aerodynamic diameter of 10 microns or less (PM_{10})	24-Hour	150	150	150
	Annual Average	50	N/A	N/A
Particulate matter with aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$)	24-Hour	35	35	35
	Annual Average	15	12	15

[1] μg/m^3 unless otherwise noted.

[2] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm.

Source: NDEP 2012a; USEPA 2012a.

Model Selection and Options

According to the Guideline on Air Quality Models (as revised) (40 CFR 51), the AERMOD Model is the preferred model for use in estimating ambient air pollutant concentrations resulting from the emissions of sources such as those within the proposed NOA and SOA projects and with terrain similar to that found within and adjacent to the study area (USEPA 2003). The AERMOD model used in this analysis (version 12345) includes the Plume Rise Model Enhancement downwash algorithms that are used to calculate plume downwash from stack emissions caused by wind flowing over and around nearby buildings.

U.S. Environmental Protection Agency's $PM_{2.5}$ Screening Level Guidance

In March, 2010, the USEPA issued a guidance memorandum (USEPA Guidance) on "Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS" (USEPA 2010a). The USEPA Guidance provides recommendations on two aspects of $PM_{2.5}$ modeling procedures. First, it addresses the demonstration that must be made in order for a source or a permitting authority to rely on the USEPA's policy that allows for a PM_{10} air quality analysis to serve as a surrogate for a $PM_{2.5}$ air quality analysis. The second part of the USEPA Guidance provides additional information on modeling procedures to demonstrate compliance with $PM_{2.5}$ NAAQS without relying on the PM_{10} surrogate policy by creating a conservative "screening level analysis" for evaluating compliance with the $PM_{2.5}$ NAAQS. The USEPA Guidance explains that the rationale for the coarse screening level analysis is premised primarily on the assumption that a modeling analysis would be performed for only direct $PM_{2.5}$ emissions and would not include air quality impacts associated with $PM_{2.5}$ precursors (oxides of nitrogen [NO_X] and SO_2) which may result in secondary $PM_{2.5}$ impacts. Certain assumptions are made in the screening level analysis, presumably to offset the lack of an explicit calculation or modeling of secondary $PM_{2.5}$ emissions.

Annual $PM_{2.5}$ National Ambient Air Quality Standards

The screening level analysis described in the USEPA Guidance for evaluating compliance with the annual $PM_{2.5}$ NAAQS recommends that the "annual design value" accounting for background concentration should be added to the highest modeled annual average concentration. The "annual design value" is determined from a 3-year average of the annual average $PM_{2.5}$ concentrations based on monitored data. The screening level analysis used the annual background value of 2.4 $\mu g/m^3$.

24-hour $PM_{2.5}$ National Ambient Air Quality Standards

The screening level analysis described in the USEPA Guidance for evaluating compliance with the 24-hour $PM_{2.5}$ NAAQS recommends that the monitored 24-hour design value should be added to the maximum modeled 24-hour average concentration. In other words, the USEPA Guidance recommends use of the highest modeled value or 1st high, rather than the 8th highest value which is normally selected for compliance modeling when AERMOD is used.

The USEPA Guidance recommends that the modeled concentration be added to the monitored "design value." The 24-hour design value is defined as the 3-year average of the 98th percentile 24-hour average $PM_{2.5}$ concentration. This screening level analysis for 24-hour impacts used a background value of 7 $\mu g/m^3$.

Air Quality Related Values

Federal Land Managers (FLMs) responsible for managing Class I areas, such as wilderness areas and national parks, are concerned with potential impacts from nearby activities on air quality related values (AQRVs) such as, visibility impairment, ozone effects on vegetation, and effects of pollutant deposition on soils and surface waters. For each of these areas of concern, FLMs' air quality guidance recommends that a screening test be applied for proposed sources greater than 50 km from a Class I area to determine whether or not any further analysis is necessary. No Class I areas are located less than 50 km from the proposed NOA and SOA projects. The screening test considers a source located greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRVs if its total SO_2, NO_X, PM_{10}, and sulfuric acid (H_2SO_4) annual emissions (in tpy, based on 24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less. Based on their guidance, FLMs would not request any further Class I AQRV impact analyses from such sources as impacts are anticipated to be negligible (USFS 2010).

Applicable Regulations for Mercury

Mercury is included on the federal list of HAPs, which has been adopted by reference in the Nevada air quality regulations. Nevada air quality regulations (NAC 445B.349) prohibit the "discharge into the atmosphere from any stationary source of any hazardous air pollutant or toxic regulated air pollutant that threatens the health and safety of the general public, as determined by the director." Mercury emissions associated with precious metals operations are regulated and controlled pursuant to the Nevada Mercury Control Program (NAC 445B.3611-3689 Nevada Mercury Control Program).The USEPA has issued a final rule on National Emissions Standard for HAPs (NESHAPs) for gold mines and gold processing facilities (40 CFR 63 Subpart EEEEEEE). The rule establishes NESHAPs for mercury emissions from gold ore processing facilities.

Mercury is a hazardous air pollutant but is not considered a criteria pollutant, and no NAAQS have been established under the CAA for mercury. Hazardous air pollutants are controlled through emissions limits at the source rather than ambient air concentrations.

3.14.1.2 Air Quality in the Study Area

Nevada is characterized by a series of mountain ranges separated by broad valleys. The eastern part of the state has an average elevation ranging from 5,000 and 6,000 feet amsl. Nevada has several mountain ranges; most of them are 50 to 100 miles long, running generally north-south. Nevada has great climatic diversity, ranging from scorching lowland desert in the south to cool mountain forests in the north. Its varied and rugged topography, mountain ranges, and narrow valleys range in elevation from approximately 1,500 to more than 10,000 feet amsl. Large local variations of temperature and rainfall are common. The principal climatic features are bright sunshine; low annual precipitation (averaging less than 9 inches in the valleys and deserts); heavy snowfall in the higher mountains; clean, dry air; and exceptionally large daily ranges of temperature.

Nevada lies on the eastern side of the Sierra Nevada Range, a massive mountain barrier that markedly influences the climate of the state. One of the greatest contrasts in precipitation found within a short distance in the U.S. occurs between the western slopes of the Sierra Range in California and the valleys immediately east of this range. The prevailing winds are from the west, and as the warm, moist air from the Pacific Ocean ascend the western slopes of the Sierra Range, the air cools, condensation takes place, and most of the moisture falls as precipitation. As the air descends the eastern slope, it is warmed, and very little precipitation occurs. The effects of this major mountain barrier are felt not only in western Nevada, but throughout the state, including the lowlands of Nevada, which are largely desert or steppes.

The existing air quality of the study area is typical of the largely undeveloped regions of the western U.S. For the purposes of statewide regulatory planning, this area has been designated as in attainment for all pollutants that have an AAQS (ambient concentrations of criteria pollutant are below the AAQS).

No areas in Nevada are currently designated as nonattainment of the $PM_{2.5}$ standard. There is a lack of sufficient data to develop a comprehensive emissions inventory for $PM_{2.5}$ from mine sources; nevertheless, an acceptable approach for assessing primary $PM_{2.5}$ emissions from fugitive dust sources is to use a percentage of the PM_{10} emissions.

A recent study conducted by the Midwest Research Institute for the USEPA recommends that the $PM_{2.5}/PM_{10}$ ratios for fugitive dust should be in the range of 0.1 to 0.15 (Midwest Research Institute 2006). It is recommended that the results of this study be used to revise the AP-42 $PM_{2.5}$ emission factors for the following four fugitive dust source categories: paved roads, unpaved roads (public and industrial), aggregate handling and storage piles, and industrial wind erosion. Emission estimates for other fugitive dust producing activities, such as construction and demolition, also would be affected since they are based on these four source categories.

3.14.1.3 Background Values for Criteria Pollutants

As shown in **Table 3.14-2**, there is no on-site monitoring within the study area; therefore, the background concentrations are adopted from other USEPA/NDEP monitoring stations in the vicinity. Under a previous AECOM monitoring project, an ambient air monitoring tower was installed near Valmy, Nevada. This is the best, closest data available, and will be the source of background concentrations in the vicinity. For PM_{10} and $PM_{2.5}$ background concentrations, data were obtained from the National Park Interagency Monitoring of Protected Visual Environments (IMPROVE) Great Basin National Park monitoring station.

3.14.1.4 General Climate and Meteorology

Three important meteorological factors influence the dispersion of pollutants in the atmosphere: mixing height, wind (speed and direction), and stability. Mixing height is the height above ground within which rising warm air from the surface would mix by convection and turbulence. Local atmospheric conditions, terrain configuration, and source location determine dilution of pollutants in this mixed layer. Mixing heights vary diurnally, with the passage of weather systems, and with season. For the study area, the mean annual morning mixing height is estimated to be approximately 1,000 feet above ground level (AGL); however, during the winter months the mean morning mixing height is approximately 80 feet AGL (Holzworth 1972). The mean annual afternoon mixing height exceeds 7,400 feet AGL.

Table 3.14-2 Background Concentrations

Pollutant	Averaging Period	Highest Measurement (μg/m³)	Available Data	Monitoring Site	Reference
CO	1-Hour 8-Hour	1,265 1,150	2009	New Valmy, Humboldt County, Nevada	New Valmy
NO_2	Annual	51	2009	New Valmy, Humboldt County, Nevada	New Valmy
$PM_{2.5}$	24-Hour Annual[1]	34 3	2008 - 2010	Great Basin National Park, White Pine County, Nevada	IMPROVE Data
PM_{10}	24-Hour[2] Annual	60 6	2008 - 2010	Great Basin National Park, White Pine County, Nevada	IMPROVE Data
SO_2	3-Hour 24-Hour Annual	18.0 8.0 3.5	2009	New Valmy, Humboldt County, Nevada	New Valmy

1 3-year average of the weighted annual mean measurements.

2 2nd high 24-hour measurement.

Source: IMPROVE 2014.

Because of the typically dry atmosphere, bright sunny days and clear nights frequently occur in the study area. This in turn allows rapid heating of the ground surface during daylight hours and rapid cooling at night. Since heated air rises, and cooled air sinks, winds tend to blow uphill during the daytime and down slope at night. This upslope and down slope cycle generally occurs in all the geographical features, including mountain range slopes and river courses. The volume of air affected is dependent on the area of the feature; the larger the horizontal extent of the feature, the greater the volume of air that moves in the cycle. The complexity of terrain features cause complex movements in the cyclic air patterns, with thin layers of moving air embedded within the larger scale motions. The lower level, thermally driven winds also are embedded within larger scale upper wind systems (i.e., synoptic winds). Synoptic winds in the region are predominantly west to east, characterized by daily weather variations that enhance or diminish the boundary layer winds, and significantly channeled by regional and local topography.

Wind speed has an important effect on area ventilation and the dilution of pollutant concentrations from individual sources. Light winds, in conjunction with large source emissions, may lead to an accumulation of pollutants that can stagnate or move slowly to downwind areas. During stable conditions, downwind usually means down valley or toward lower elevations. Climate data from Elko indicate that the potential for air pollution episodes to last 5 or more days is nearly zero (Holzworth 1972). A potential air pollution episode is defined as a period of time with wind speeds less than 4 miles per hour and mixing heights less than 3,300 feet.

Morning atmospheric stability conditions tend to be stable because of the rapid cooling of the layers of air nearest the ground. Afternoon conditions, especially during the warmer months, tend to be neutral to unstable because of the rapid heating of the surface under clear skies. During the winter, periods of stable afternoon conditions may persist for several days in the absence of synoptic (i.e., continental scale) storm systems to generate higher winds with more turbulence and mixing. A high frequency of inversions at lower elevations during the winter can be attributed to the nighttime cooling and sinking air flowing from higher elevations to the low lying areas in the basins. Although winter inversions are generally quite shallow, they tend to be more stable because of reduced surface heating.

The precipitation climate in the vicinity of the study area is classified as arid with elevations below 6,500 feet receiving the least amount of precipitation, 5 to 9 inches per year is common, while the mountainous areas are significantly wetter, receiving 11 to over 16 inches of precipitation annually. An arid climate is characterized by low rainfall, low humidity, clear skies, and relatively large annual and diurnal temperature ranges.

3.14.1.5 Class I Area Visibility Study

The boundary of Jarbidge Wilderness, a Class I area, is approximately 180 km to the north of the proposed NOA and SOA projects. Class I areas are protected by FLMs who manage AQRVs such as visibility and atmospheric deposition. Though not a regulatory program under Prevention of Significant Deterioration (PSD), FLMs review the issuance of a PSD permit for any impacts that exceed guideline thresholds for these parameters. In addition to analysis of the visibility and atmospheric deposition, the change in the acid neutralizing capacity of sensitive lakes is assessed by FLMs. The FLMs consider a source located greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRVs if its total SO_2, NO_X, PM_{10}, and H_2SO_4 annual emissions (in tpy, based on 24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less. The agencies would not request any further Class I AQRV impact analyses from such sources. In general, the Federal Land Managers' Air Quality Related Values Work Group (FLAG) recommends that an applicant apply the Q/D test (FLAG 2010) for proposed sources greater than 50 km from a Class I area to determine whether or not any further visibility analysis is necessary. Visibility impacts are assessed as part of the environmental consequences analysis, determining the overall impact of future emissions on air, water, and land environments.

3.14.1.6 Climatology Data

Average temperatures at the both the Elko ASOS station and the Alligator Ridge Remote Automatic Weather Station range from about 25°F in January to the 80s (°F) in July and August. **Table 3.14-3** shows the maximum, average, and minimum temperatures at the stations during the period of record (please see note #1 below tables). Summers are typically hot and dry except in the higher mountain ranges. The average annual precipitation is approximately 9.9 inches at the Elko site, and 5.5 inches at the Alligator Ridge site. Average relative humidity ranges from a low of 35 percent in the summer to a high of 69 percent in spring (NOAA 2012). Net evaporation exceeds precipitation in the study area.

Table 3.14-3 Monthly Climate Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly Climate Summary – Elko, Nevada[1]													
Average Max. Temperature[2]	36.3	41.4	51.6	59.4	69.2	80.0	90.3	88.5	78.5	64.5	48.2	37.2	62.2
Average Min. Temperature[2]	13.9	18.4	26.2	31.0	37.6	44.4	50.1	47.9	39.1	28.7	21.2	14.7	31.2
Average Temperature[2]	25.1	29.9	38.9	45.2	53.4	62.2	70.2	68.2	58.8	46.6	34.7	26.0	46.7
Average Total Precipitation[3]	1.12	0.84	1.00	0.97	0.96	0.65	0.37	0.37	0.57	0.75	1.11	1.20	9.91
Average Total Snow Fall[3]	7.8	4.6	3.8	1.8	0.5	0.0	0.0	0.0	0.0	0.5	3.2	6.4	28.7
Average Snow Depth[3]	2	1	0	0	0	0	0	0	0	0	0	1	0

Table 3.14-3 Monthly Climate Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly Climate Summary – Alligator Ridge, Nevada[1]													
Average Max. Temperature[2]	39.2	41.2	48.9	54.6	64.9	75.8	86.1	84.0	75.1	61.6	47.7	38.5	60.0
Average Min. Temperature[2]	20.9	22.2	27.6	32.4	40.6	49.5	58.3	56.3	47.8	37.2	26.8	19.8	36.5
Average Temperature[2]	29.2	30.9	37.8	43.3	53.0	63.2	72.6	70. 5	61.2	48.6	36.2	28.2	47.8
Average Total Precipitation[3]	0.33	0.39	0.50	0.67	0.79	0.60	0.44	0.39	0.38	0.64	0.29	0.22	5.66
Average Total Snow Fall[3]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Average Snow Depth[3]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[1] Meteorological data recorded from January 1, 1981 to December 31, 2010.

[2] °F.

[3] Inches.

Source: WRCC 2012b.

3.14.1.7 Evaporation

Climate studies measure evaporation from an exposed water surface contained in a large pan. No pan evaporation data have been collected in the proposed NOA and SOA projects. In order to estimate evaporation, WRCC pan-evaporation data from other sites across Nevada were used and interpreted to estimate pan evaporation. The WRCC has pan-evaporation values available for 11 stations in Nevada. The pan evaporation rates range from a low 51.2 inches per year at the Beowawe University of Nevada Ranch Station to a high of 116 inches per year at the Boulder City site (WRCC 2008).

Five pan-evaporation stations with climatic characteristics similar to the study area are listed in **Table 3.14-4**. The Ruby Lake Station, which lies about 10 miles north northeast of the study area, was considered to be the most directly comparable setting to the Bald Mountain mining areas. Accordingly, the Ruby Lake site pan-evaporation value of about 51.5 inches per year has been used for the study area.

To determine actual shallow-pool evaporation, the pan-evaporation is multiplied by a factor of 0.70. This results in an estimated open-water evaporation rate of about 46.5 inches per year.

Table 3.14-4 Comparison of Pan-evaporation Rates at Selected Nevada Sites

Station	Mean Annual Temperature[1]	Elevation[2]	Pan Evaporation[3]
Ruby Lake	46.7	6,010	51.5
Beowawe University of Nevada Ranch	46.7	5,750	51.2
Fallon Experiment	51.2	3,970	62.5
Rye Patch Dam	50.7	4,160	59.4
CNFL	45.2	5,960	66.4

[1] °F.

[2] feet amsl.

[3] inches per year.

Source: WRCC 2012b.

3.14.2 Environmental Consequences

This section discusses project related impacts to air quality resulting from the Proposed Action, Reconfiguration Alternative, WRM Alternative, and No Action Alternative. Primary issues related to air quality include the exceedence of NAAQS within the local or regional area impacted by total project pollutant emissions.

3.14.2.1 Proposed Action

Potential Sources of Air Pollutants

The subsequent air quality analysis includes the following categories of potential sources of air pollutants within the NOA and SOA projects:

- Process emission sources (i.e., lime silos, refining, emergency generators, etc.);
- Insignificant sources (i.e., prill silos, boiler, building heaters, storage tanks, etc.); and
- Other particulate and gaseous emission sources (e.g., point, mobile and area sources) and windblown fugitive and reentrained dust resulting from vehicular traffic (i.e., drilling; blasting; material loading, unloading, and hauling; dozing; grading; wind erosion of exposed surfaces such as open pits, rock disposal areas, overburden storage, tailings, borrow pits, and GMSs and mobile and stationary internal combustion engine exhausts; etc.).

Open Pit Mining and Hauling

The mining process would use standard open pit mining techniques of drilling, blasting, loading, and hauling of ore and waste. Waste rock would be removed from the open pit by blasting with ammonium nitrate and fuel oil explosive (ANFO), loaded by front-end loaders or shovels into haul trucks, and hauled to a nearby RDA. Leach material would then be mined by similar methods: the ore would be drilled, blasted with ANFO, loaded into haul trucks, and hauled to a nearby HLF.

Leaching and Carbon Adsorption

Prior to placement on the heap leach pad, lime would be added to the ore to adjust the pH for leaching. Lime would be stored in silos near each leach pad area. Emissions from silo loading would be controlled by vent filters, and silo discharge to the dosing hoppers would be controlled by enclosures. The transfer of lime from the hoppers to the ore trucks would be controlled by best operating practices.

Carbon Stripping and Electrowinning

Heat for the strip solution would be provided by a propane-fired boiler that has emissions of criteria pollutants and HAPs. From the pressure strip vessel, the pregnant strip solution would be sent to the Electrowinning (EW) cells with potential emissions of mercury. Mercury emissions from the EW cells and barren tank would be controlled by a carbon adsorption filter.

Retorting and Melting

The precious–metal-bearing material from the EW cells would first be retorted to remove mercury and then refined in the furnace. The propane-fired retort would remove mercury by heating the material until the mercury vaporizes. The mercury vapor would be cooled, condensed, and collected as a liquid. The gases exiting the retort condenser would be passed through a carbon filter to remove any residual mercury before being released to the atmosphere.

After retorting, the precious-metal-bearing material would be transferred to the propane-fired furnace, where it would be heated with flux that separates impurities from the gold to produce doré bars. Emissions from the furnace would pass through a baghouse and carbon adsorption filter prior to release to the atmosphere.

Carbon Reactivation

After repeated use, the carbon used in the gold recovery process loses efficiency and requires reactivation. To reactivate the carbon, it would be heated in a propane-fired reactivation kiln to remove impurities. The air emissions from the kiln would be controlled by an off-gas cooler and carbon adsorption filter.

Reagent Storage and Ancillary Equipment

A fuel bay would be located near each truck shop, and diesel tanks would be located near the main process areas. Ammonium nitrate prill would be stored onsite in storage silos. Barrick also would maintain emergency generators at the process plants, HLFs, and other essential areas; and operate several propane-fired building heaters.

<u>Air Pollutants</u>

The subsequent air quality analysis includes modeled potential emissions from the Proposed Action for the following air pollutants and averaging periods:

- CO: 8-hour and 1-hour averaging periods;
- NO_2: annual and 1-hour averaging periods;
- $PM_{2.5}$: annual and 24-hour averaging periods;
- PM_{10}: 24-hour averaging period; and
- SO_2: 3-hour and 1-hour averaging periods.

<u>Emissions and Source Characterization</u>

For the pollutants included in the air quality dispersion modeling analysis, the estimated facility-wide potential annual emissions (tpy) are presented in **Table 3.14-5**.

Table 3.14-5 Facility-wide Potential Emissions from the Proposed Action by Source Category

Source Category	$PM_{2.5}$ (tpy)	PM_{10} (tpy)	CO (tpy)	NO_X (tpy)	SO_2 (tpy)	VOC* (tpy)
Process	5.64	10.06	34.07	49.27	0.42	10.22
Insignificant	2.58	2.58	8.35	14.47	1.77	4.78
Fugitive	154.64	764.61	3,284.14	1,816.11	1.70	280.99
Facility Total	162.86	777.26	3,326.56	1,879.85	3.89	295.99

* = volatile organic compound.

Source: Air Sciences 2013a.

Air Quality Dispersion Modeling Analysis

AAQS are maximum concentrations of pollutants in ambient air that are considered protective of the public health. These standards are established by environmental regulatory authorities for air pollutants with known human health effects or that would adversely impact the environment. The estimated total ambient concentrations (modeled concentrations plus applicable background concentrations) from this analysis were compared with the NAAQS for compliance demonstration.

Modeling Assumptions

The dispersion model calculates ambient concentrations for each hour of the modeled time period, and thus appropriate hourly emission rates must be calculated for each modeled source for each modeled time period. The dispersion modeling assumed an operational and facility configuration that simulated a realistic operational maximum scenario. Assumptions include:

- Full production for the maximum production year;
- Heap leach pads and waste rock dumps to be built to one-half of their full proposed heights;
- Open pits to be at their full depth, which results in the maximum potential emissions from the haul trucks;
- The modeled short-term emission rates for the process and insignificant sources were derived from the maximum design hourly process rates;
- The long-term emission rates were derived using the maximum hourly process rates and estimated annual utilization factors; and
- The modeled emission rates for the fugitive sources were determined using annual activity rates for the maximum production year (Air Sciences 2013a).

Unlike process sources, emissions from fugitive sources (e.g., drilling, blasting, material loading, unloading, hauling, dozing, grading, wind erosion of exposed surfaces, and mobile machinery tailpipes) are represented by appropriate activity locations to account for the spatial nature of these activities.

The modeled maximum concentrations and the estimated total ambient concentrations (modeled concentrations plus background concentrations) and their comparison with the applicable NAAQS are presented in **Table 3.14-6**. Highest concentrations are generally found at or near the site boundary.

Table 3.14-6 Highest Modeled Air Pollutant Concentrations from the Proposed Action

Pollutant and Averaging Time	Dispersion Modeling Results ($\mu g/m^3$)	Background ($\mu g/m^3$)	Dispersion Modeling Results with Background ($\mu g/m^3$)	Ambient Standard ($\mu g/m^3$)
CO 8-Hour	168.9	0	168.9	10,000
CO 1-Hour	964.0	0	964.0	40,000
NO_2 1-Hour	79.1	0	79.1	188
NO_2 Annual	4.2	0	4.2	100
PM_{10} 24-Hour	9.9	10.2	20.1	150
$PM_{2.5}$ 24-Hour	9.7	7.0	16.7	35
$PM_{2.5}$ Annual	0.6	2.4	3.0	12
SO_2 3-Hour	1.4	0	1.4	1,300
SO_2 1-Hour	2.2	0	2.2	196

Source: Air Sciences 2013a.

The estimated maximum predicted total ambient concentrations resulting from implementation of the Proposed Action are all below the applicable NAAQS for all the pollutants and averaging periods. Please note that for $PM_{2.5}$, the impact analysis followed the recommendations in the USEPA Guidance which yields a screening level analysis that indicates that the Proposed Action is not expected to cause or contribute to a violation of the 24-hour and annual averaging period $PM_{2.5}$ NAAQS.

Hazardous Air Pollutant Emissions

HAP emissions are primarily created from the combustion of fuel, storage of process chemicals, as constituents of the fugitive dust generated by mining processes, and as fugitive emissions from open pits, HLFs, and RDAs. The air pollution sources at the existing/authorized NOA and SOA have an estimated facility-wide potential to emit 10.39 tpy of all HAPs combined. The highest single HAP is hydrogen cyanide at 6.44 tpy.

Process and fugitive mercury emissions were estimated for the Proposed Action as a part of the HAP emission analysis. Mercury emissions from the refinery sources were estimated using the general industry Nevada Maximum Achievable Control Technology emission limits and the exhaust flow rate for each source. Mercury emissions from fugitive dust were calculated using the average mercury concentration in the ore and waste and the total particulate emissions generated from mining processes.

Fugitive mercury emissions caused by the naturally occurring mercury in the ore and waste volatilizing after extraction were calculated using mercury flux data collected by the University of Nevada, Reno, from the Cortez-Pipeline Mine (Eckley et al. 2010). The mercury flux measurements from the Cortez-Pipeline Mine were taken from low-grade ores containing an average of 0.87 ppm of mercury, and waste containing an average of 0.56 ppm of mercury (Eckley et al. 2010). The whole rock analysis conducted for the Adaptive Waste Rock Management Plan showed that the average mercury concentration in the ore and waste at the existing BMM is 0.51 ppm. Therefore, the flux rates measured from the Cortez-Pipeline waste rock dump, leach pads, and pit, were used to estimate fugitive mercury emissions from the existing BMM. The rate of mercury emissions were then used to extrapolate total emissions from the existing BMM to calculate emissions from the Proposed Action. Based on the total surface area of the proposed RDAs, active and inactive HLFs, and open pits, the Proposed Action has a potential to emit 0.04 tpy (80 pounds per year) of fugitive mercury emissions.

Air Quality Related Values

The annual emissions of SO_2, NO_X, H_2SO_4, and PM_{10} are used to derive the potential AQRV impacts as a result of the Proposed Action as shown in **Table 3.14-7**. This approach provides a conservative analysis of potential impacts to Class I areas since it includes the pollutants of interest to the FLM, and is calculated using the highest 24-hour emission rates as if those highest emissions occurred every hour of the day for a full year.

Table 3.14-7 Facility-wide Potential Emissions by Pollutant

Pollutant	Operations (tpy)[1]
SO_2	3.89
NO_X	1,816.11
H_2SO_4	0
PM	777.26
Total	**2,597.26**

[1] Annual emissions (tpy) are based on the potential to emit at the highest hourly rates and conservatively assumes 8,760 hours per year.

Jarbidge Wilderness, a Class I area, is located approximately 180 km north of the mine site. A source located greater than 50 km from a Class I area is deemed to have negligible impacts with respect to Class I AQRVs if its total SO_2, NO_X, PM_{10}, and H_2SO_4 annual emissions (in tpy, based on 24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less.

The Q/D test is calculated based on 2,597.26 tpy total emissions divided by 180 km resulting in a ratio of 14.4. Since this indicates there is a small potential that emissions from the Proposed Action would have impacts on visibility or other air quality related values at a Class I area, an additional air dispersion modeling analysis was conducted to assess air quality concentrations from the Proposed Action at Jarbidge (Air Sciences 2013b). This analysis used the same inputs and approaches described above for the criteria modeling analysis. AERMOD was run with three receptors at the southern boundary of the Jarbidge Wilderness, the closest portion of the Class I area relative to the BMM. Each of the receptors had the same coordinate location, but a different elevation. These receptors represent the elevation profile of the entire Jarbidge Wilderness Class I area (lowest, average, and highest elevations). The resultant maximum concentrations were shown to be less than the Class I significant impact levels (SILs). The SILs are concentrations below which impacts are deemed to be *de minimis*.

Air emissions, including point and fugitive sources, would be controlled in accordance with the air quality operating permits for the proposed NOA and SOA projects and with present BMPs. BMPs include use of dust abatement techniques on unpaved, unvegetated surfaces to minimize airborne dust; maintenance of equipment to ensure proper function; post and enforce speed limits; use of dust abatement techniques before and during surface clearing, excavation, or blasting activities; and compliance with NDEP air permit.

3.14.2.2 North and South Operations Area Facilities Reconfiguration Alternative

The Reconfiguration Alternative, as described in detail in Chapter 2.0, Section 2.5.1, is limited to those aspects of the alternative that differ from the previously described Proposed Action. Additionally, all applicant-committed measures described for the Proposed Action would, as applicable, be required for the Reconfiguration Alternative.

Under the Reconfiguration Alternative, the total estimated surface disturbance for the NOA and SOA projects would be approximately 5,175 acres. With consideration of the 1,986 acres of existing authorized disturbance that would not be constructed under the Reconfiguration Alternative, implementation of this alternative would result in a reduction of 3,703 acres (54 percent) of surface disturbance in comparison to the Proposed Action.

Under the Reconfiguration Alternative, operation levels would be similar to the Proposed Action, but with a reduced life of mine of 10 years compared with 20 years for the Proposed Action. Emissions during the period of operation would be similar to the Proposed Action. Accordingly, potential impacts to air quality during operation would be the same as described for the Proposed Action.

3.14.2.3 Western Redbird Modification Alternative

The WRM Alternative, as described in detail in Chapter 2.0, Section 2.5.2, is limited to those aspects of the alternative that differ from the previously described Reconfiguration Alternative. Additionally, all applicant-committed measures described for the Reconfiguration Alternative would, as applicable, be required for the WRM Alternative.

Under the WRM Alternative, the total estimated surface disturbance for the NOA and SOA projects would be approximately 4,773 acres. With consideration of the 2,220 acres of existing authorized disturbance that would not be constructed under the WRM Alternative, implementation of this alternative would result in a reduction of 636 acres of surface disturbance in comparison to the Reconfiguration Alternative.

Under the WRM Alternative, operation levels would be similar to the Reconfiguration Alternative, but with reduced disturbances in the Redbird Pit area and Numbers Complex Pit area. Emissions during the period of operation would be similar to the Reconfiguration Alternative. Accordingly, potential impacts to air quality during operation would be the same as described for the Reconfiguration Alternative.

3.14.2.4 No Action Alternative

Under the No Action Alternative, the proposed NOA and SOA projects would not be developed and associated impacts to air quality would not occur. Barrick would continue its operations, closure, and reclamation activities within the NOA and SOA boundaries under the terms and current permits and approvals as authorized by the BLM and State of Nevada. Under the No Action Alternative, construction of all previously authorized expansion and associated facilities would be implemented and reclaimed as authorized.

3.14.2.5 Cumulative Impacts

The 2,070,999-acre CESA for air quality consists of the Huntington Valley, Newark Valley, Long Valley, and Ruby Valley hydrographic basins (**Figure 3.3-1**). Past and present actions and RFFAs are discussed in Section 2.7, Past, Present, and Reasonably Foreseeable Future Actions; their locations are illustrated in **Figure 2.7-1**.

Past and present actions have resulted, or would result, in approximately 30,372 acres of total surface disturbance within the air quality CESA. The total quantifiable surface disturbances are related to mining, oil and gas development, wind energy development, exploration, land, road, and utility corridor development, agriculture, livestock grazing; residential developments, and other county and government actions. RFFAs proposed within the air quality CESA include, but are not limited to, the following: mining-related actions (totaling 2,549 acres), oil and gas lease sales within the Long, Ruby, and Huntington valleys (acreage unknown), vegetation treatments (totaling 56,572 acres), and implementation of the USFWS Ruby Mountain NWR CCP.

The types and quantities of mobile equipment used in the Proposed Action would be similar to the existing mine operations, resulting in similar emissions of criteria air pollutants from internal combustion engines. For particulates, the Proposed Action would increase disturbance by an additional 6,903 acres and remove 11 acres of existing authorized disturbance from the 30,372 acres of past and present disturbance resulting in a total cumulative disturbance of approximately 96,745 acres (5 percent of the total air quality CESA). The Reconfiguration Alternative incrementally would increase disturbance by an additional 5,175 acres and remove 1,986 acres of existing authorized disturbance from resulting in a total cumulative disturbance of approximately 93,042 acres (4 percent of the total air quality CESA). The WRM Alternative incrementally would increase disturbance by an additional 4,773 acres and remove 2,220 acres of existing authorized disturbance from past and present disturbance resulting in a total cumulative disturbance of approximately 92,406 acres (4 percent of the total air quality CESA). Under the No Action Alternative, cumulative impacts to air quality would be the same as those described in the *Final Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project* (BLM 2009a) and *Environmental Assessment for the Mooney Heap and Little Bald Mountain Expansion Project* (BLM 2011a).

Cumulative impacts to air quality would include impacts from the proposed Project emission sources in combination with impacts from nearby emission sources that are accounted for in the background levels added to the modeled impacts. Increases in surface disturbance affect the emissions and impacts of particulates ($PM_{2.5}$ and PM_{10}).

Mercury and Mercury Emissions

Mercury emissions to the atmosphere come from both background and man-made or anthropogenic sources. Background sources of mercury include natural sources such as naturally enriched soils and volcanoes. There are both global and local anthropogenic sources of mercury. When bound in mineral forms that typically appear in ore (e.g., cinnabar), mercury is a stable compound that remains in solid form. Ore processing has the potential to liberate mercury from these stable minerals by dissolving it in process solutions. Because it has a boiling point of 675°F, mercury has the potential to volatilize into a gaseous form when subjected to thermal processes in a recovery and refining circuit.

Mercury is not considered a criteria pollutant, and no NAAQS have been established under the Clean Air Act Amendments for mercury. Mercury is included on the federal list of HAPs, which has been adopted by reference in the Nevada air quality regulations. Nevada air quality regulations (NAC 445B.349) prohibit the “discharge into the atmosphere from any stationary source of any hazardous air pollutant or toxic regulated air pollutant that threatens the health and safety of the general public, as determined by the director.” The USEPA has issued a final rule on National Emissions Standard for HAPs (NESHAPs) for gold mines and gold processing facilities (40 CFR 63 Subpart EEEEEEE). The rule establishes NESHAPs for mercury emissions from gold ore processing facilities. HAPs are controlled through emissions limits at the source rather than ambient air concentrations. Mercury emissions associated with precious metals operations are also regulated and controlled pursuant to the Nevada Mercury Control Program (NAC 445B.3611-3689 Nevada Mercury Control Program).

Climate Change

Scientific research has identified the potential impacts of anthropogenic GHG emissions and changes in biological carbon sequestration due to land management activities on global climate. More recent reporting of trends in global mean surface temperatures by Hansen et al. (2010) and studies of climate change, such as the Berkeley Earth Surface Temperature Study (Berkeley 2012) and The Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (Intergovernmental Panel on Climate Change [IPCC] 2011), provide further evidence that the earth is getting warmer and further describe the potential impacts of climate change. Section 3.23, Energy Requirements and Greenhouse Gas Emissions, contains an evaluation of GHG emissions and climate change impacts.

3.14.2.6 Monitoring and Mitigation Measures

No mitigation measures are recommended or necessary in view of the demonstrated absence of adverse impacts to air quality. Air quality emission sources at the proposed NOA and SOA projects would be subject to requirements of federal and Nevada air quality regulations. NDEP Bureau of Air Quality would determine whether air quality construction and operating permits would be required for the Proposed Action. The air quality permitting process could require Barrick to submit a permit application, including a complete inventory of potential criteria air pollutant emissions and control measures from the Proposed Action.

3.14.2.7 Residual Impacts

Emissions of criteria pollutants would occur as a result of the proposed NOA and SOA projects (**Table 3.14-6**). However these impacts would not cause exceedences of NAAQS. Residual impacts associated with particulate matter (PM_{10} and $PM_{2.5}$) would be reduced through soil stabilization and subsequent reclamation. As vegetation becomes re-established on disturbed areas, particulate levels should return to typical conditions of a dry desert environment. Once the disturbance ceases and wind-erodible surfaces are reclaimed, the resource would return to approximately its pre-mining condition.

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3.15 Land Use and Access

The study area for land use is defined as the proposed NOA and SOA plan boundaries. The study area for access includes the proposed NOA and SOA plan boundaries as well as the primary access roads such as Ruby Valley County Road 1 (Ruby Valley Road), White Pine County Road 3 (Long Valley Road), and U.S. Highway 50. The CESA for land use and access includes the proposed NOA and SOA plan boundaries (including the TUC) as well as the roads: 1) from Elko via State Highway 228 south (73 miles); 2) from Ely via U.S. Highway 50 to White Pine County Road 3 (Long Valley Road) (56 miles); and 3) from Eureka via U.S. Highway 50 to State Highway 892 (Strawberry Road) (45 miles). **Figure 3.15-1** illustrates the study area and CESA for land use and access.

3.15.1 Affected Environment

3.15.1.1 Land Use

The majority of the study area is administered by the BLM, followed to a much lesser extent by private ownership. Within the study area, the proposed NOA would total 31,085 acres; the proposed SOA would total 10,865 acres. A summary of land management and ownership within the study area is shown in **Table 3.15-1**.

Table 3.15-1 Land Management or Ownership within the Study Area

Management or Ownership	NOA Federal (BLM)		NOA Private	
	Acres	Percent	Acres	Percent
Ownership (Acres/%)	30,843	99.2	242	0.8
Management or Ownership	**SOA Federal (BLM)**		**SOA Private**	
	Acres	**Percent**	**Acres**	**Percent**
Ownership (Acres/%)	10,865	100	0	0
Project Area Total	**41,708**	**99.4**	**242**	**0.6**

The study area is within the historic Bald Mountain Mining District. Mining began here in the late 1800s and historically produced gold, silver, copper, antimony, and tungsten ores. Historical accounts indicate wood was plentiful with good timber southwest of the study area; however, water was scarce. The Bald Mountain Mining District was enlarged in 1976 to include Alligator Ridge and the northeastern portion of Buck Mountain (Kautz et al. 2004).

The study area is located within the administrative boundaries of the BLM Egan Field Office and is currently managed according to the Ely District ROD and Approved RMP (BLM 2008b). USFS lands adjacent to the study area are currently managed according to the Toiyabe National Forest Land and Resource Management Plan (USFS 1986). A forest plan revision was initiated, but activity on the revision has been suspended as of May 2009 (USFS 2009).

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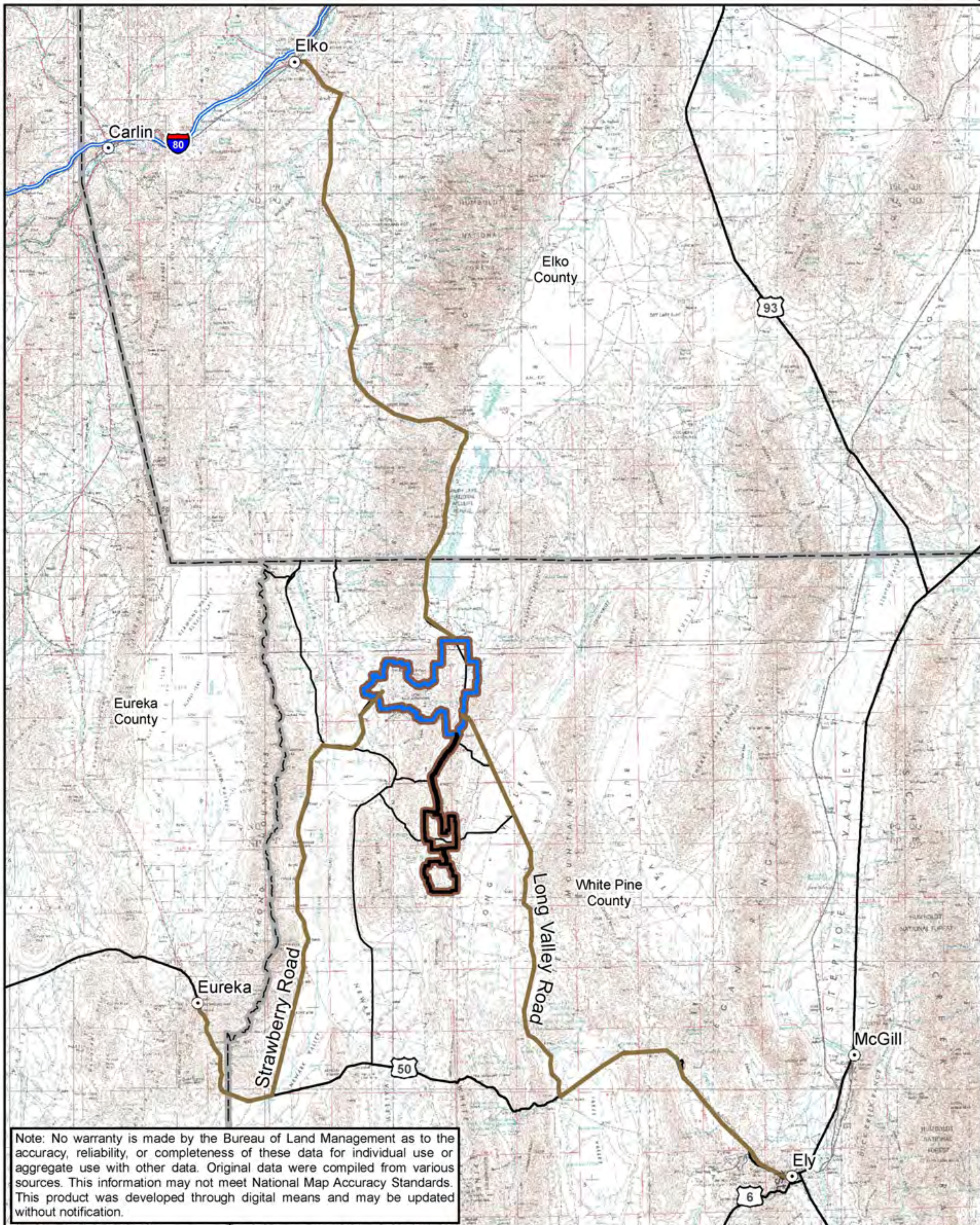

BLM

Ely District Office

Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Land Use and Access Cumulative Effects Study Area

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.15-1

Land Use and Access Study Area and Cumulative Effects Study Area

0 2.5 5 10 Miles

N

Source: Barrick 2012a,b; BLM 2012a.

11/18/2014

Of particular relevance to the land use discussion, the RMP's objective for "lands and realty" states:

> "To respond to public, local, state, and federal agency needs for land for community development, utility and other associated rights-of-way, communication sites, and other allowed uses on BLM-administered lands." (BLM 2008b)

To that end, no public lands within the study area have been identified as disposal areas, indicating their availability for sale or trade to private entities.

The RMP objective for locatable minerals states:

> "Allow development of solid leasable and locatable minerals in a manner to prevent unnecessary or undue degradation." (BLM 2008b)

All of the BLM-administered public lands within the study area are open to development of locatable minerals.

White Pine County zoning in the study area is 05, which is the least restrictive zoning category and allows for mining (White Pine County 2012). There are regulations governing procedures for subdividing land throughout the county, but uses are not controlled in most of the county including the Long and Ruby valleys. White Pine County adopted a Policy for Public Lands addressing the county's priorities for management of federal lands within its boundaries (White Pine County PLUAC 2007). The general statement of the county's objective for public lands states:

> "Support the concept of Multiple Use Management as an overriding philosophy for management of the public lands based on multiple use and sustainable yield concepts, and in a way that will conserve natural resources." (White Pine County PLUAC 2007)

The Policy for Public Lands emphasizes the county's support for, and dependence on, mineral resources development. Specifically, the mineral resources objective states:

> "Encourage the careful development and production of White Pine County's mineral resources while recognizing the need to conserve other environmental resources." (White Pine County PLUAC 2007)

Existing land use in the study area includes open space, grazing, mining, dispersed recreation (particularly in the adjacent Humboldt-Toiyabe National Forest). The existing mining operations are a dominant contributor to the local economy.

Ely, Nevada and Eureka, Nevada are the primary residential communities within the study area. Ely, located approximately 40 miles southeast of the study area, had a 2010 population of 4,255. Ely is a full service town with lodging, gas stations, restaurants, and recreational facilities. The unincorporated township of Eureka, located approximately 25 miles southwest of the study area, had a 2010 population of 610. Eureka offers significantly less services than Ely (U.S. Census Bureau 2010a).

There is no prime or unique farmland in the vicinity of the study area. In addition, there are no irrigated hay fields located within or near the study area.

The nearest special designation to the study area is the Sunshine Locality National Register District, located approximately 3,700 feet southeast of the study area. This special designation contains more than 90 archaeological sites and is located within a 35,000-acre area. It is closed to mineral materials and has a No Surface Occupancy for fluid minerals, but it is currently open to locatable minerals. Additionally, the Pony Express National Historic Trail is located approximately 9,400 feet north of the study area.

There are no Indian Reservations within the study area.

3.15.1.2 Access

The study area is served by a sparse network of roadways typical of rural Nevada. U.S. Highway 50, “The Loneliest Road In America,” is the primary east-west traffic artery across central Nevada, connecting with Reno, Nevada, to the west and Ely, Nevada, to the east, going on to join up with I-70 in central Utah. U.S. Highway 50 is approximately 25 miles south of the study area. State Highway 93, approximately 35 miles to the east of the study area running north-south, connects Ely, Nevada, to the south with Wells, Nevada to the north. I-80 runs east-west, connecting Reno, Nevada, to the west with Salt Lake City, Utah, to the east. I-80 is approximately 60 miles north of the study area.

The main access point on the western portion of the study area is State Highway 892 (Strawberry Road) originating at U.S. Highway 50 and running north along the western boundary of the study area through Newark Valley. State Highway 892 is a paved, two-lane highway. The main access point on the eastern portion of the study area is White Pine County Road 3 (Long Valley Road), a county road originating at U.S. Highway 50 and running north along the eastern boundary of the project area. White Pine County Road 3 (Long Valley Road) is a county maintained gravel road. County Road 4 transects east-west through the study area, connecting White Pine County Road 3 (Long Valley Road) and Ruby Valley County Road 1 (Ruby Valley Road). The study area transportation network is depicted in **Figure 2.4-6**.

Existing traffic conditions on White Pine County Road 3 (Long Valley Road) near the study area at level of service (LOS) “A.” LOS will be defined in the following section. As detailed in **Table 3.15-2**, traffic volume from 2001 to 2010 as a percent on U.S. Highway 50 east of State Highway 892 (Strawberry Road), increased only marginally. Traffic volume on White Pine County Road 3 (Long Valley Road) during this same time period was unchanged, and traffic volume on State Highway 892 (Strawberry Road) increased by over 28 percent, although the change in absolute values was minor. According to NDOT, both U.S. Highway 50 and White Pine County Road 3 (Long Valley Road) recorded peak volumes in 2005 and 2006 before settling down to current levels. Peak traffic volumes on State Highway 892 (Strawberry Road) were recorded in 2003 and 2006.

Table 3.15-2 Traffic within the Study Area (Average Annual Daily Traffic)

Location	2001	2005	2010	Percent Change 2005-2010	Percent Change 2001-2010
U.S. Highway 50 (1.2 miles east of Fish Creek Road to Duckwater)	550	590	570	-3.4	3.6
White Pine County Road 3 (Long Valley Road) (100 feet north of U.S. Highway 50, near MP 36)	40	50	40	-20	0
State Highway 892 (Strawberry Road) (.1 mile north of U.S. Highway 50)	70	80	90	12.5	28.6

Source: NDOT 2011.

There is a network of lesser roads throughout the valley varying from well-maintained gravel roads to primitive two-track roads. These roads provide local access to both public and private lands, including access points to the adjacent Humboldt-Toiyabe National Forest.

3.15.2 Environmental Consequences

This section discusses project related impacts to land use and access resulting from the Proposed Action, Reconfiguration Alternative, WRM Alternative, and No Action Alternative. Primary issues related to land use and access include direct and indirect impacts associated with the termination or modification of existing land uses or ROWs and alteration of land use patterns including stimulated or encouraged development of land uses not presently anticipated, or conversely, precluded other planned or proposed uses.

3.15.2.1 Proposed Action

Land Use

Under the Proposed Action, the proposed NOA and SOA plan boundaries would encompass 41,950 acres resulting in a net increase of 18,138 acres compared to the existing plan boundaries. Implementation of surface disturbance activities as a result of proposed development and expansion would remove approximately 4,346 acres within the proposed NOA; and approximately 2,557 acres within the proposed SOA.

The Proposed Action is consistent with BLM plans and policies that designate land use within the proposed NOA and SOA projects as open for mineral exploration and development, as described in the RMP (BLM 2008b). Although White Pine County does not have jurisdiction to regulate land use on federal lands, the proposed NOA and SOA projects would be consistent with the county's preference for "multiple use" management and retention of existing mining areas as expressed in the Policy for Public Lands (White Pine County PLUAC 2007). The proposed NOA and SOA projects would not occur on USFS land; therefore, no impacts are anticipated. In summary, the Proposed Action would comply with adopted plans and policies of potentially affected governmental entities.

The proposed NOA and SOA projects currently experience minimal public use, moderate levels of livestock grazing, and a modest amount of dispersed recreation use, which primarily consists of crossing the area to access the adjacent Humboldt-Toiyabe National Forest, as well as hunters accessing Hunt Units within Management Area 10. Recreational use by hunters rises considerably between August 1 and January 1. The largest numbers of public users are most likely people coming and going to the Ruby Lake NWR to the north.

Under the Proposed Action, surface disturbance (6,903 acres) would reduce the amount of land available for livestock grazing and dispersed recreation, although the loss would be very small relative to the overall area, particularly considering the limited current use levels. The specifics of the loss of livestock grazing and recreation access to public lands are addressed in Section 3.9, Livestock Grazing, and Section 3.16, Recreation, respectively. None of the proposed surface disturbance would occur on currently irrigated cropland; therefore, a loss of crop production would not occur as a result of the Proposed Action.

Under the Proposed Action, ROW N-89754 (LBM Communication Site) and N-90053 (Country Access Road) would be authorized under the amended PoO and the ROW would be relinquished.

The proposed NOA and SOA projects would require the development of six transmission lines (totaling approximately 22 miles) and the construction and/or upgrade of three substations. The transmission lines would utilize single pole structures and would range from 24.9 kV to 69 kV. Mount Wheeler Power supplies aforementioned electrical power to the existing transmission lines and associated substations and transformers, and would continue to provide proposed electrical power needs to the proposed NOA and SOA projects. Barrick would obtain necessary permits from, and coordinate construction and operation specifications (including engineering design considerations) with Mount Wheeler Power.

With the exception of open pits and pit backfill areas, all project components would be reclaimed. Post-reclamation land use in all areas except for open pits and pit backfill areas (862 acres within the proposed NOA; and 347 acres within the proposed SOA) would be returned to open space, grazing, dispersed recreation, and wildlife habitat. These uses would be consistent with local and BLM land use plans and guidelines.

Access

Three categories of traffic would be generated by the proposed NOA and SOA projects: 1) worker commuting traffic, 2) general company and contractor traffic, and 3) material deliveries. Worker commuting would be predominantly a minor addition to bus or passenger van traffic, which is the primary mode of transportation to the existing Bald Mountain Mine. Workers not using employee transportation would typically utilize automobiles and pickup trucks. Material deliveries would employ mainly heavy trucks and tractor-trailer rigs.

The Proposed Action would require approximately 660 mine and contractor workers during the 2015 to 2023 timeframe, decreasing to approximately 240 mine and contractor workers during the 2026 to 2030 timeframe. Mine and contractor workers are expected to peak in 2017 at approximately 780 workers. It is assumed these workers would mostly commute to the proposed NOA and SOA by bus plus a small number of light vehicles (Barrick 2012a,b). Because of the influencing variables associated with the mine plan, it is estimated that for the Proposed Action, haul road traffic may increase by 20 percent, but no more than 30 percent at various points within the life of mine plan. These various points do not have an associated duration or timeframe. Of course, based on the fact that economics influence the mine plan, there may not be any increase to haul road traffic, which would represent a zero percent increase in comparison to the No Action Alternative.

Highway traffic effects as a result of the Proposed Action were analyzed using techniques promulgated in the Highway Capacity Manual (Transportation Research Board [TRB] 2000). The standard measure of traffic flow from the Highway Capacity Manual is LOS for a given segment of roadway. LOS is a method of qualitatively measuring the operational conditions of traffic flows on roadways, and the perception of those conditions by motorists and passengers (TRB 2000). LOS are rated “A” through “F”; “A” generally represents free-flowing traffic conditions with few restrictions and “F” represents a “forced or breakdown” flow with queues forming and traffic volumes exceeding theoretical capacity of the roadway (TRB 2000). Generally, level “E” represents traffic volumes at the capacity of the roadway. Based on these traffic assumptions, the proposed NOA and SOA projects would have minimal effects on existing traffic levels in the project vicinity. On affected roadways, the LOS would remain at “A” throughout the life of the project (TRB 2000).

Transportation safety concerns related to highway traffic generated by the Proposed Action are anticipated to be minimal in light of the current road network capacity and the anticipated increase in roundtrips. Development of the proposed NOA and SOA projects would have no effect on the physical characteristics of the major intersections or the geometrics of State Highway 892. Lines of sight at intersections are unobstructed and sight distances are ample. The increase in traffic is anticipated to be modest, remaining well within the capacity of the roadway. The mix of heavy vehicles in the traffic stream would not change substantively. As such, any increase in the risk of traffic accidents would be minor and proportional to the overall increase in traffic.

Approximately 26,045 feet of existing roads and two-tracks would be re-routed around the proposed Vantage facilities. This re-route would be constructed in accordance with White Pine County road standards. Alternate routes for public access would be available during construction and signage would be put in place to advice the public of road closures and alternative routes. Additionally, the proposed construction of the TUC between the proposed NOA and SOA projects as well as proposed upgrades between the Yankee and Vantage facilities would consist of upgrading and maintaining existing sections of county roads to facilitate heavy mine equipment and construction equipment traffic. During construction, flaggers would be utilized to stop and direct traffic and signage would be used to notify travelers of construction activity. Signage and barriers would be erected to deter public access once modification and construction of the county roads and TUC would be completed. Three mine road/public access road intersections are present within the proposed NOA and SOA project (Winrock, Vantage, and Yankee HLF). During construction of these intersections, flaggers would be present to stop and direct signage, and appropriate construction signage would be erected. Signage and barriers would be erected to deter public access once construction of the intersections would be completed. Although traffic levels on local public roads remain very low and standard traffic controls (e.g., signage) would be in place at the intersections, there would be an increase in risk of accidents at the intersection and a minor increase in travel times at public intersections compared with existing conditions.

Based on the preceding analysis, development of the proposed NOA and SOA projects would not adversely affect highway traffic in the project vicinity. Development of the proposed NOA and SOA projects would modify mine road and public road intersections; however, appropriate measures would be implemented to reduce the safety risk and the flow of traffic. As stated previously, increases in traffic, including heavy vehicles, would be minimal. As such, any increase in the risk of traffic accidents would be minor and proportional to the overall increase in traffic. Roadway safety conditions would be slightly degraded; the degree would depend partially on the level of traffic through the mine and public road intersections.

A Traffic Management Plan has been developed to provide standard construction, operation, and maintenance practices for light vehicles and mine equipment traffic using public access routes and locations where mine roads intersect public roads (Barrick 2012a,b). As part of the Traffic Management Plan, Barrick would execute a road maintenance agreement with White Pine County. Furthermore, all other BLM roads with the NOA and SOA boundaries that are impacted by mine operations would be maintained by Barrick. Design features and ACEPMs applicable to land use and access are summarized in Section 2.4.3, Design Features and Applicant-committed Environmental Protection Measures, for the Proposed NOA and SOA projects.

Based on this analysis, the effects of the Proposed Action on land use and access in the project vicinity would be considered minor.

3.15.2.2 North and South Operations Area Facilities Reconfiguration Alternative

Under the Reconfiguration Alternative, implementation of surface disturbance activities as a result of proposed development and expansion would remove approximately 2,943 acres within the proposed NOA; and approximately 2,232 acres within the proposed SOA. With the exception of open pits and pit backfill areas, all project components would be reclaimed, representing a permanent loss of 564 acres within the proposed NOA; and a permanent loss of 321 acres within the proposed SOA as open space for grazing, dispersed recreation, and wildlife habitat. With consideration of the 1,986 acres of existing authorized disturbance that would not be constructed under the Reconfiguration Alternative, implementation of this alternative would result in a decrease of 3,703 acres of surface disturbance in comparison to the Proposed Action. Effects of the Reconfiguration Alternative on access would be similar to those described for the Proposed Action.

3.15.2.3 North and South Operations Area Western Redbird Modification Alternative

The WRM Alternative would be the same as the Reconfiguration Alternative, except that the Redbird Pit and RDA footprints have been reduced and there are proposed changes to haul roads, reclamation, and snow routes that would benefit mule deer (for a total of 2,541 acres of proposed disturbance in the NOA). With consideration of both proposed disturbance and previously authorized acreages that would not be constructed under this alternative, the WRM Alternative would have 636 fewer acres of proposed development and expansion in the NOA than the Reconfiguration Alternative. Effects of the WRM Alternative on access would be similar to those described for the Reconfiguration Alternative, except some haul roads would have restrictions on truck traffic to benefit mule deer.

3.15.2.4 No Action Alternative

Under the No Action Alternative, the proposed NOA and SOA projects would not be developed and associated impacts to land use and access would not occur. Barrick would continue its operations, closure, and reclamation activities within the NOA and SOA boundaries under the terms and current permits and approvals as authorized by the BLM and State of Nevada. ROW N-89754 (LBM Communication Site) and N-90053 (Country Access Road) would remain. Under the No Action Alternative, construction of all previously authorized expansion and associated facilities would be implemented and reclaimed as authorized. The area released for public use after completion of reclamation activities would be a minor incremental increase in available land. Traffic demand would decline on local county and state roads after closure as a result of the loss of jobs and subsequent reduction in vehicle traffic.

3.15.2.5 Cumulative Impacts

The CESA for land use and access includes the proposed NOA and SOA plan boundaries (including the TUC) as well as the roads: 1) from Elko via State Highway 228 south (73 miles); 2) from Ely via U.S. Highway 50 to County Road 3 (Long Valley Road) (56 miles); and 3) from Eureka via U.S. Highway 50 to State Highway 892 (Strawberry Road) (45 miles) (**Figure 3.15-1**) for a total of 41,950 acres. Past and present actions and RFFAs are discussed in Section 2.7, Past, Present, and Reasonably Foreseeable Future Actions; their locations are illustrated in **Figure 2.7-1**.

Past and present actions have resulted, or would result, in approximately 15,412 acres of total surface disturbance within the land use and access CESA. The total quantifiable surface disturbances are related to mining, oil and gas development, wind energy development, exploration, land, road, and utility corridor development, agriculture, livestock grazing; residential developments, and other county and government actions. RFFAs proposed within the land use and access CESA include, but are not limited to oil and gas lease sales within the Long, Ruby, and Huntington valleys (acreage unknown). The CESA also includes proposed fuels reduction and vegetation treatments totaling 10,300 acres. Mineral leasing and vegetation treatment are consistent with BLM and White Pine County plans and policies. The Proposed Action incrementally would remove 11 acres of authorized disturbance and increase surface disturbance from past and present actions by an additional 6,903 acres resulting in a total cumulative disturbance of approximately 22,304 acres (53 percent of the total land use and access CESA). The Reconfiguration Alternative would remove 1,986 acres of authorized disturbance from the 15,412 acres of past and present actions and incrementally increase surface disturbance by an additional 5,175 acres resulting in a total cumulative disturbance of approximately 18,601 acres (44 percent of the total land use and access CESA). The WRM Alternative would remove 234 acres of previously authorized disturbance and 402 acres of the proposed surface disturbance that would occur under the Reconfiguration Alternative for a total cumulative disturbance of approximately 17,965 acres (43 percent of the total cultural resource CESA). Fuels reduction and vegetation treatment RFFAs are not considered in these calculations as they would not result in changes to designated land use.

Under the No Action Alternative, cumulative impacts to land use and access would be the same as those described in the *Final Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project* (BLM 2009a) and *Environmental Assessment for the Mooney Heap and Little Bald Mountain Expansion Project* (BLM 2011a).

Although the cumulative surface disturbance would be greater than the surface disturbance associated with the Proposed Action, Reconfiguration Alternative, or WRM Alternative, it still would be a small increment of the acreage of public lands in the area (less than 1 percent of BLM administered lands within the Egan Field Office), and would have minimal effect on land uses displaced by past and present actions and RFFAs within the land use and access CESA. The cumulative unreclaimed surface disturbance area that would remain after completion of the interrelated actions, including the open pit areas of the Proposed Action, Reconfiguration Alternative, and WRM Alternative would be a small percentage of the total land area in the land use and access CESA. As such, cumulatively impacts would have a negligible effect on land uses.

There would be few, if any, cumulative effects on access or traffic conditions from the Proposed Action, Reconfiguration Alternative, or WRM Alternative, in conjunction with other past and present actions and RFFAs because they are all relatively small traffic generators and most of their access points are widely distributed throughout the land use and access CESA.

3.15.2.6 Monitoring and Mitigation Measures

No additional monitoring and mitigation measures are recommended.

3.15.2.7 Residual Impacts

Assuming successful reclamation of all project components, residual impacts would include the permanent alteration of land uses on approximately 1,210 acres, and 885 acres, and 780 acres for the Proposed Action, Reconfiguration Alternative, and WRM Alternative, respectively. These residual impacts would be associated with open pit and pit backfill areas, which would not be reclaimed. Additionally, minor increases in traffic delays and potential for increased accident risk would occur.

3.16 Recreation

The study area for recreation is defined as the proposed NOA and SOA plan boundaries. The CESA for recreation encompasses the proposed NOA and SOA plan boundaries plus a 4-mile buffer, as well as the southern Ruby Mountains and portions of Huntington Valley, Newark Valley, and Long Valley north of U.S. Highway 50. **Figure 3.16-1** illustrates the study area and CESA for recreation.

3.16.1 Affected Environment

Recreation sites near the study area are categorized into developed, primitive, or dispersed. Developed recreation sites are sites that provide facilities such as picnic tables, toilets, and informational signs and are easy to access. Primitive recreation sites are indicated on maps but do not have developed facilities. Dispersed recreation sites do not have any developed facilities, are not indicated on maps, and usually are used as an access point for other forms of recreation such as hunting or fishing. Access to dispersed recreation sites can vary from easy to difficult. Dispersed recreational opportunities are commonly associated with solitude and a primitive experience (BLM 2008a).

Recreational activities within and adjacent to the study area include casual and dispersed activities, such as OHV use, hunting, fishing, camping, cross-country skiing, horseback riding, caving, geocaching, rock climbing, mountain biking, and heritage tourism (BLM 2008a).

Recreation within the jurisdiction of the BLM Ely District Office is managed through the designation of special recreation management areas (SRMAs) and extensive recreation management areas (ERMAs). An SRMA is defined as an area where more intensive recreation management is needed and where recreation is a principal management objective. There are no SRMAs within the study area. The nearest SRMA, the Loneliest Highway Special Recreation Management Area, is located approximately 10 miles south of the study area. ERMAs are areas where visitors are expected to rely on their own skill, knowledge, and equipment when participating in recreational activities. Management actions are primarily limited to providing basic information and access to the public (BLM 2008a).

No developed recreation areas are present within the study area. The nearest developed recreation facility to the study area is associated with the Ruby Lake NWR, approximately 4 miles north of the study area. The Ruby Lake NWR received its designation in 1938 as a breeding ground for migratory birds and other wildlife. Recreational activities include waterfowl hunting, fishing, boating, and bird watching. Facilities are modest, with only a few restrooms on the refuge and at the refuge headquarters. Camping is not allowed at the Ruby Lake NWR; however, opportunities do exist on the USFS lands near the NWR. Access from the south to the Ruby Lake NWR is permitted via White Pine County Road 3 (Long Valley Road) (USFWS 2011). Illipah Reservoir also provides developed recreational facilities and is located approximately 20 miles south of the study area. Recreational activities include fishing, camping, and picnicking. The BLM maintains campgrounds with picnic tables, wind screens, and vault toilets.

Dispersed camping may occur on BLM-administered lands as well as on the Humboldt-Toiyabe National Forest. Cold Creek Reservoir, located 5 miles west of the study area, offers fishing opportunities for rainbow trout, bowcutt trout, and largemouth bass. There are no developed recreational facilities; however, primitive facilities include a boat ramp and camping (NDOW 2012d). Cold Creek Reservoir can be accessed from State Highway 892 (Strawberry Road). The nearest developed campground is the South Ruby Campground approximately 10 miles north of the study area in the Humboldt-Toiyabe National Forest, just west of the Ruby Lake NWR. Recreational activities within the Humboldt-Toiyabe National Forest include hiking, horseback riding, cross-country skiing, photography, camping, hunting, fishing, snowmobiling, mountain biking, and 4-wheeling. The boundaries of local recreational areas are depicted in **Figure 3.16-2.**

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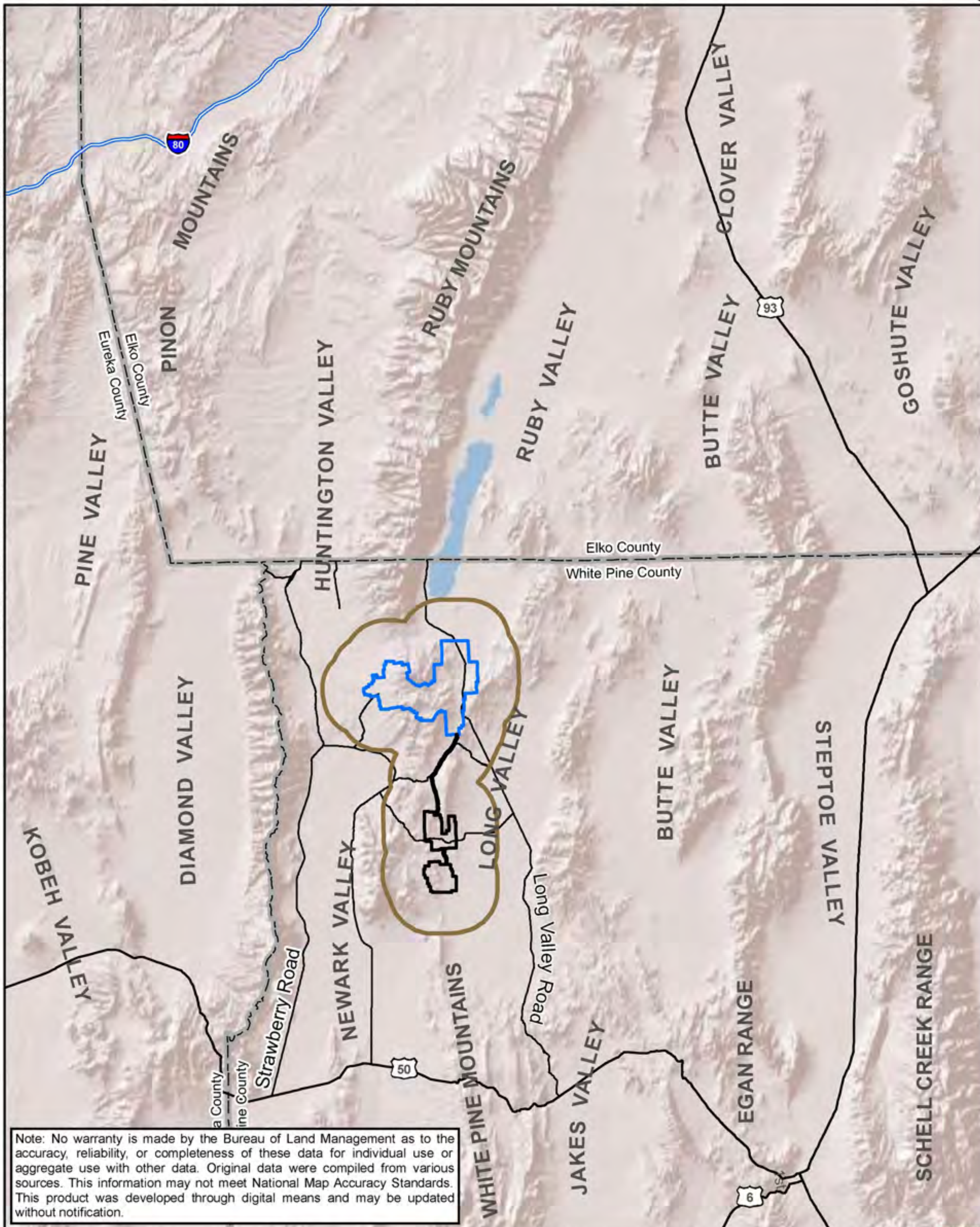
BLM

Ely District Office



Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Recreation Cumulative Effects Study Area

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.16-1

Recreation Study Area and Cumulative Effects Study Area

0 2.5 5 10 Miles

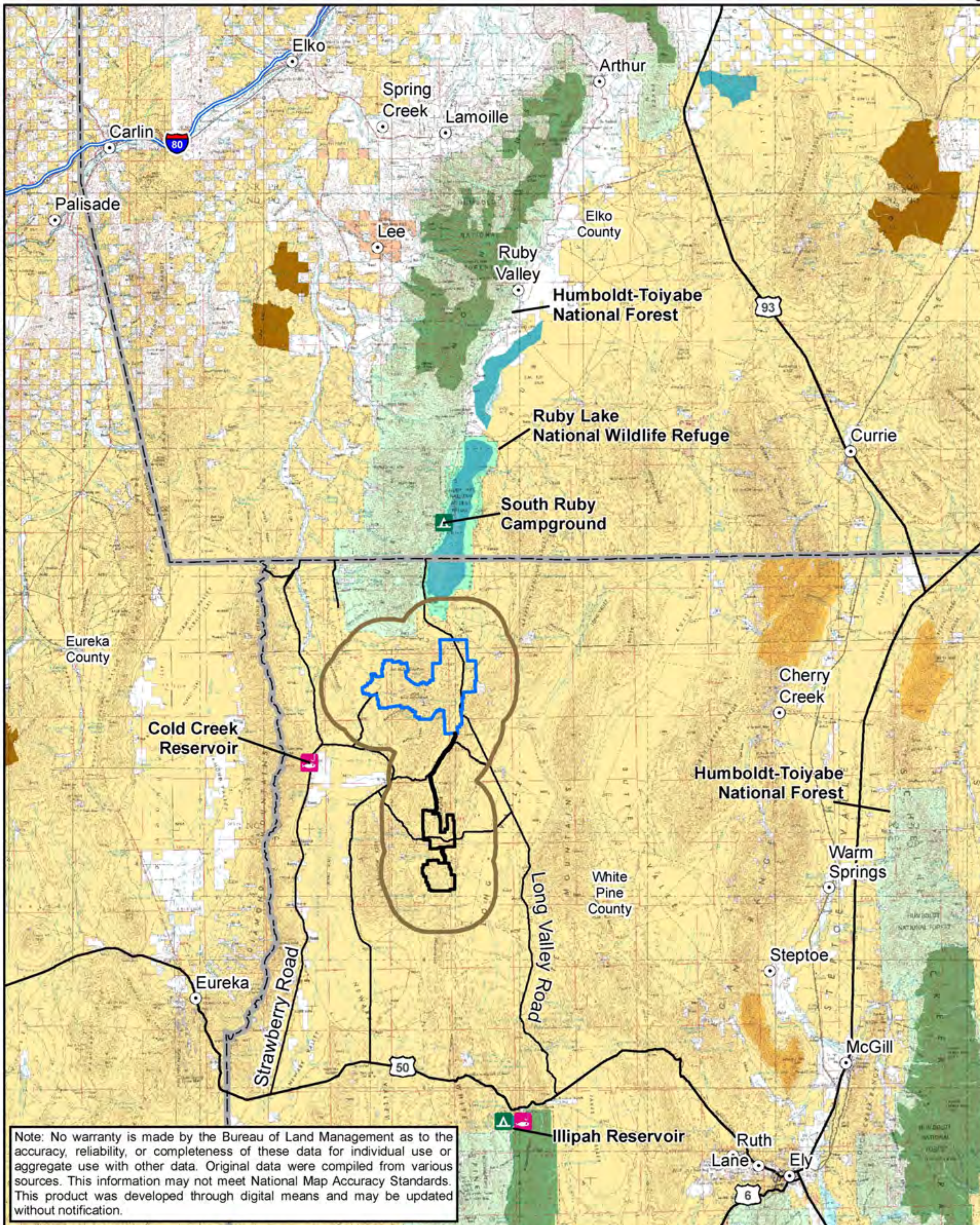
N

Source: Barrick 2012a,b; BLM 2012a..

7/6/2015

BLM

Ely District Office



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Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Recreation Cumulative Effects Study Area
- U.S. Forest Service Wilderness Land
- BLM Wilderness Area
- BLM Wilderness Study Area
- Campground
- Fishing Access

Land Status

- Bureau of Indian Affairs
- Bureau of Land Management
- Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State
- Private

Source: BLM 2014d, 2012a, SRK 2012.

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.16-2

Recreation Areas Adjacent to the Study Area

0 2.5 5 10 Miles

N

7/9/2015

The proposed NOA and SOA project boundaries are located within NDOW Big Game Management Area 10. Management Area 10 is composed of Hunt Units 101 through 108;portions of Hunt Units 104 and 108 are within the study area (**Figure 3.7-1**). Hunt Units 104 and 108 overlap approximately 9 percent and 91 percent, respectively, of the study area and 18 percent and 78 percent, respectively within the recreation CESA. Very small portions of Hunt Units 103 and 144 also fall within the recreation CESA, but are not analyzed due to their limited overlap of the study area. Hunting (deer, elk, and pronghorn), fishing, horseback riding, hiking, picnicking, camping, and off-road vehicle use are popular activities within the Management Area. There also is some predator hunting, primarily for coyotes and mountain lions.

Hunting makes up one of the primary recreational activities within and adjacent to the study area; as discussed in Section 3.17, Socioeconomics, the numbers of tags vary from year-to-year, but over the past decade, Management Area 10 has accounted for between 22.9 and 33.81 percent of the statewide total. In 2011, 3,694 deer tags were issued for Hunt Area 10. NDOW data does not indicate how many of these tags were for Hunt Units 104 and 108, and it is important to note that the number of deer tags issued for Management Area 10 (or Hunt Units 101 through 108) would be based on population and others factors related to the entire Management Area 10 mule deer herd. Within the study area, hunting pressure is believed to be limited by difficult access and limited wildlife values. In 2010, mule harvest totals within Hunt Unit 108 were as follows: mule deer (67 individuals), pronghorn (12 individuals), and elk (2 individuals). Harvest totals within Hunt Unit 104 were as follows: mule deer (87 individuals), pronghorn (21 individuals), and elk (4 individuals) (NDOW 2011c). Within Management Area 10 as a whole and with consideration of all all hunts and weapon classes, NDOW reported a 39 percent success rate of harvesting a four-point or better mule deer (NDOW 2011c).

The Pony Express National Historic Trail, which offers opportunities for historical tourism, is located approximately 2 miles north of the proposed NOA. A detailed description of the Pony Express National Historic Trail is located in Section 3.12.1.3, Prehistoric and Historic Overview.

OHV use on all BLM-administered land in the study area is limited to existing roads and trails. Data on recreation use on BLM administered land within the study area are not available. Data on recreation use on USFS-administered land near the study area also are not available, but use levels are estimated to be low most of the time (USFS 2011d).

3.16.2 Environmental Consequences

This section discusses project related impacts to recreation resulting from the Proposed Action, Reconfiguration Alternative, WRM Alternative, and No Action Alternative. Primary issues related to recreation include the potential to displace dispersed recreational use from areas for which there are no reasonable substitutes as a result of decreases in game population, reduced quality of the aesthetic experience, and loss of access.

3.16.2.1 Proposed Action

Under the Proposed Action, implementation of surface disturbance activities as a result of proposed development and expansion would remove approximately 4,346 acres within the proposed NOA; and approximately 2,557 acres within the proposed SOA. The majority (99 percent) of the surface disturbance would occur on BLM-administered public lands.

Public access for recreational purposes would be prohibited within the proposed NOA and SOA per MSHA requirements. The proposed NOA and SOA boundaries would increase by a total of 18,138 to 41,950 acres. Public access would be controlled with fences and locked gates or other physical methods, therefore restricting recreational access within these areas. However, most of this restricted area receives low to moderate recreational use at the present time because of minimal recreational opportunities or limited resource access resulting from development activities. Also, there is extensive public land in the immediately surrounding area that could accommodate migration of dispersed recreation activity from the proposed NOA and SOA, although some recreationists who have utilized a specific area that would no longer be accessible may not be accommodated by a shift to alternative nearby recreational options.

The Proposed Action may deter access to Humboldt-Toiyabe National Forest and Ruby Lake NWR to some degree due to increased traffic from construction personnel and construction-related equipment deliveries. However, main public access roads to these areas, such as White Pine County Road 3 (Long Valley Road) and State Highway 892 (Strawberry Road) are lightly utilized and it is anticipated that any project related increase in traffic would not preclude access to recreational destinations in a meaningful way (see Section 3.15.2.1). Access to Humboldt-Toiyabe National Forest and Ruby Lake NWR also would be available from the north via State Highway 226 and Ruby Valley County Road 1 (Ruby Valley Road). The Pony Express Trail is expected to be available to visitors; however, as detailed in Section 3.12.2, visitors would potentially experience visual impacts from the proposed Project when visiting the trail. Mule deer hunting and viewing opportunities near the study may decrease incrementally in the long term as a result of a gradual reduction in the amount of available mule deer habitat, although some of the risk to mule deer under the Proposed Action would be alleviated by the mule deer design features described in Section 2.4.3.1. Impacts to mule deer are discussed in more detail within Section 3.7.2.1.

A modest increase of 283 individuals in regional population may occur as a result of the Proposed Action (Section 3.17, Social and Economic Values). This new population would result in a population increase within the study area of less than 0.5 percent of the existing population within the study area. The new residents would increase the demand for recreation resources and opportunities in the region, but the increase would be very small in the context of the existing population base. Ample public land is available in the region to accommodate dispersed recreation needs of the increased population. Minor effects to parks and other developed recreation facilities may occur in the communities where the increase in population would reside, primarily Ely, Eureka, and, to a small extent, Elko, Nevada.

All project components would be reclaimed in accordance with the Reclamation Plan (Barrick 2012a,b), and would be available for dispersed recreation use. There would be a permanent loss of open pits and pit backfill area for dispersed recreation use (862 acres within the proposed NOA; and 347 acres within the proposed SOA). Overall, recreational opportunities and resources would likely remain minimal.

Design features and ACEPMs applicable to recreation are summarized in Section 2.4.3, Design Features and Applicant-committed Environmental Protection Measures for the Proposed North and South Operations Area Projects. Based on the implementation of these measures, the ample supply of alternative land for dispersed recreation activities and the lack of unique recreation resources, the effects of the Proposed Action on recreation within and adjacent to the proposed NOA and SOA projects would be considered minor.

3.16.2.2 North and South Operations Area Facilities Reconfiguration Alternative

Under the Reconfiguration Alternative, implementation of surface disturbance activities as a result of proposed development and expansion would remove approximately 2,943 acres within the proposed NOA; and approximately 2,232 acres within the proposed SOA. With the exception of open pits and pit backfill areas, all project components would be reclaimed, representing a permanent loss of 564 acres within the proposed NOA; and a permanent loss of 321 acres within the proposed SOA. With consideration of the 1,986 acres of existing authorized disturbance that would not be constructed under the Reconfiguration Alternative, implementation of this alternative would result in a decrease of 3,703 acres of surface disturbance in comparison to the Proposed Action. The life of the mine would be reduced from 20 to 10 years.

Effects of the Reconfiguration Alternative on recreation would be similar to those described for the Proposed Action, except that that the duration of impacts would be reduced, and mule deer hunting and viewing opportunities near the study area would be impacted less as a result of the maintenance of mule deer migration corridors. Refer to Section 3.7.2.2 of Wildlife and Fisheries Resources, for additional discussions on impacts to mule deer under the Reconfiguration Alternative.

Design features and ACEPMs applicable to recreation are summarized in Section 2.4.3, Design Features and Applicant-committed Environmental Protection Measures for the Proposed North and South Operations Area Projects. Based on the implementation of these measures, the ample supply of alternative land for dispersed recreation activities and the lack of unique recreation resources, the effects of the Reconfiguration Alternative on recreation within and adjacent to the proposed NOA and SOA projects would be considered minor.

3.16.2.3 North and South Operations Area Western Redbird Modification Alternative

The WRM Alternative would be the same as the Reconfiguration Alternative, except for a reduction in the Redbird Pit and RDA footprints, additional reductions in mining durations in the Red Bird Pit and the west side of the North Operations Area, and changes to haul roads, reclamation, and snow routes to benefit mule deer.

Effects of the WRM Alternative on recreation would be similar to those described for the Reconfiguration Alternative, except that there would be 636 fewer acres of surface disturbance. Mule deer hunting and viewing opportunities near the study area may be impacted less as a result of wider deer migration corridors resulting from reduced footprints and concurrent reclamation, traffic restrictions to reduce disturbance and potential for collisions with deer, and the snow management route through the west side of the NOA.

3.16.2.4 No Action Alternative

Under the No Action Alternative, the proposed NOA and SOA projects would not be developed and associated impacts to recreation would not occur. Barrick would continue its operations, closure, and reclamation activities within the NOA and SOA boundaries under the terms and current permits and approvals as authorized by the BLM and State of Nevada. Under the No Action Alternative, construction of all previously authorized expansion and associated facilities would be implemented and reclaimed as authorized. A continuation of existing recreation conditions would occur for the duration of authorized activities.

3.16.2.5 Cumulative Impacts

The CESA for recreation encompasses the proposed NOA and SOA plan boundaries plus a 4-mile buffer, as well as the southern Ruby Mountains and portions of Huntington Valley, Newark Valley, and Long Valley north of U.S. Highway 50 (**Figure 3.16-1**) for a total of 259,553 acres. Past and present actions and RFFAs are discussed in Section 2.7, Past, Present, and Reasonably Foreseeable Future Actions; their locations are illustrated in **Figure 2.7-1**.

Past and present actions have resulted, or would result, in approximately 17,466 acres of total surface disturbance within the recreation CESA. The total quantifiable surface disturbances are related to mining, oil and gas development, wind energy development, exploration, land, road, and utility corridor development, agriculture, livestock grazing; residential developments, and other county and government actions. RFFAs proposed within the recreation CESA include, but are not limited to, the following: oil and gas lease sales within the Long, Ruby, and Huntington valleys (acreage unknown), vegetation treatments (totaling 36,672 acres), and implementation of the USFWS Ruby Lake NWR CCP. Past and present actions within the recreation CESA would not directly affect access to parks, concentrated recreational use areas, designated wilderness or Wilderness Study Areas, or other protected areas in the recreation CESA. Fuels reduction and vegetation treatment RFFAs would result in increased noise, dust, and treatment traffic from vegetation activities as the proposed treatments are implemented and may result in a short-term shift of dispersed recreational use to other non-affected areas. Long-term impacts may include a change from denser vegetation to more open vistas as treatments are completed, and improvements to wildlife habitat that may provide more opportunity for wildlife viewing and hunting opportunities (BLM 2013a).

The Proposed Action, Reconfiguration Alternative, and WRM Alternative would result in additional surface disturbance would limit access to dispersed recreational opportunities. The Proposed Action would remove 11 acres of authorized disturbance from the 17,466 acres of past and present actions and incrementally increase surface disturbance by an additional 6,903 acres resulting in a total cumulative disturbance of approximately 59,030 acres (23 percent of the total recreation CESA, over half of which would be short-term disturbance due to vegetation treatments). The Reconfiguration Alternative would remove 1,986 acres of authorized disturbance and incrementally increase surface disturbance by an additional 5,175 acres resulting in a total cumulative disturbance of approximately 55,327 acres (21 percent of the total recreation CESA). The WRM Alternative would remove 234 acres of the previously authorized disturbance and 402 acres of the proposed surface disturbance that would occur under the Reconfiguration Alternative for a total cumulative disturbance of approximately 54,691 acres (21 percent of the total cultural resource CESA). Under the No Action Alternative, cumulative impacts to recreation would be limited to impacts from previously authorized activities. Impaired access to recreational activities would be the most prominent impact. Further detail of cumulative impacts to recreation under the No Action Alternative would be the same as those described in the *Final Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project* (BLM 2009a) and *Environmental Assessment for the Mooney Heap and Little Bald Mountain Expansion Project* (BLM 2011a).

Although the cumulative surface disturbance would be considerably greater than the surface disturbance associated with the Proposed Action, Reconfiguration Alternative, or WRM Alternative, the existing acreage of public lands (approximately 11.5 million acres of BLM-administered land within the Ely District Office) would continue to accommodate dispersed recreation activities displaced by past and present actions and RFFAs within the recreation CESA. Potential changes to mule deer populations within NDOW Management Area 10 both inside and outside the CESA boundary may affect recreational activities within the CESA and may reduce the number of tags sold and/or harvest success, should the Ruby Mule Deer Herd decline. This would decrease the recreational experience in the areas, as well as potentially resulting in socioeconomic impacts within the CESA. Estimating potential declines in the herd is impossible as it is heavily influenced by several factors unrelated to the proposed Project or RFFAs; factors such as winter severity, drought, and disease. However, cumulative disturbance to habitat for this herd would impact the population’s resistance to these factors. Sections 3.7 and 3.17 contain addition discussions on cumulative impacts to mule deer.

Cumulative recreational impacts would still be considered low to moderate during operations as a result of restricted access to previously accessible dispersed recreational opportunities such as hunting. The cumulative surface disturbance that would remain after completion of the interrelated actions and reclamation, including the open pits associated with the Proposed Action, Reconfiguration Alternative, or WRM Alternative would be a small percentage of the total land area available for dispersed recreation in the recreation CESA. As such, cumulative impacts would have a negligible effect on recreation resources and opportunities upon completion of reclamation activities.

3.16.2.6 Monitoring and Mitigation Measures

No additional monitoring and mitigation measures are recommended.

3.16.2.7 Residual Impacts

Assuming successful reclamation of all project components, residual impacts to recreation opportunities would include the permanent loss for dispersed recreation use of approximately 1,210 acres, 885 acres, and 780 acres for the Proposed Action, Reconfiguration Alternative, and WRM Alternative, respectively. These residual impacts would be associated with open pits, which would not be reclaimed.

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3.17 Social and Economic Values

The study area and CESA for social and economic values includes Elko, Eureka, and White Pine counties; with particular focus on the communities of Elko, Carlin, Spring Creek, Eureka, and Ely, Nevada. **Figure 3.17-1** illustrates the study area and CESA for social and economic values. The rationale for the study area and CESA is that the mine would be located in White Pine County, but near the Eureka County and Elko County lines. The mine would generate public revenue directly for White Pine County and indirectly for Elko and Eureka counties. It is anticipated that a substantial majority of the workers would live in Elko County because of a combination of proximity, housing availability, and availability of a broad range of public and private services.

3.17.1 Affected Environment

3.17.1.1 Population and Demography

Elko County is the sixth largest, by population, in Nevada, with 48,818 people in 2010 (**Table 3.17-1**). White Pine and Eureka counties, in contrast, are notably smaller, ranked 10^{th} and 16^{th} largest among Nevada's 17 counties, respectively. Nevada has been one of the country's fastest growing states for much of the past three decades, but it was one of the hardest hit by the recent recession. Consequently, the state demographer estimates the state lost population between 2008 and 2009. During the expansion, the bulk of the growth occurred in urbanized areas, particularly southern Nevada. Elko County experienced rapid growth in the 1980s, which continued at a lesser pace into the 1990s; however, the rate has tapered off in recent years (**Table 3.17-1**). White Pine and Eureka counties have trailed the statewide growth rate by a substantial margin for nearly three decades. White Pine County lost population in the 1990s, but has made a modest recovery since. The most dramatic growth in the area has occurred in unincorporated Spring Creek, which is more than six times larger than it was in 1980.

Table 3.17-1 Population Characteristics

Area	1980	1990	2000	2010	Average Annual Change 1980-1990 (%)	Average Annual Change 1990-2000 (%)	Average Annual Change 2000-2010 (%)
Elko City	8,771	14,736	16,708	18,297	5.3	1.3	0.9
Spring Creek CDP[1]	2,002	5,866	10,548	12,361	11.3	6.0	1.6
Carlin	1,233	2,220	2,161	2,368	6.1	(0.3)	0.9
Elko Co.	**17,269**	**33,530**	**45,291**	**48,818**	**6.9**	**3.1**	**0.8**
Eureka Co.	**1,198**	**1,550**	**1,651**	**1,987**	**2.6**	**0.6**	**1.9**
Ely City	4,882	4,756	4,041	4,255	(0.3)	(1.6)	0.5
White Pine Co.	**8,167**	**9,264**	**9,181**	**10,030**	**1.3**	**(0.1)**	**0.9**
Nevada	**800,493**	**1,201,833**	**1,998,257**	**2,700,551**	**4.1**	**5.2**	**3.1**

[1] CDP – Census Designated Place.

Sources: Nevada State Demographer 2009; U.S. Census Bureau 2010b.

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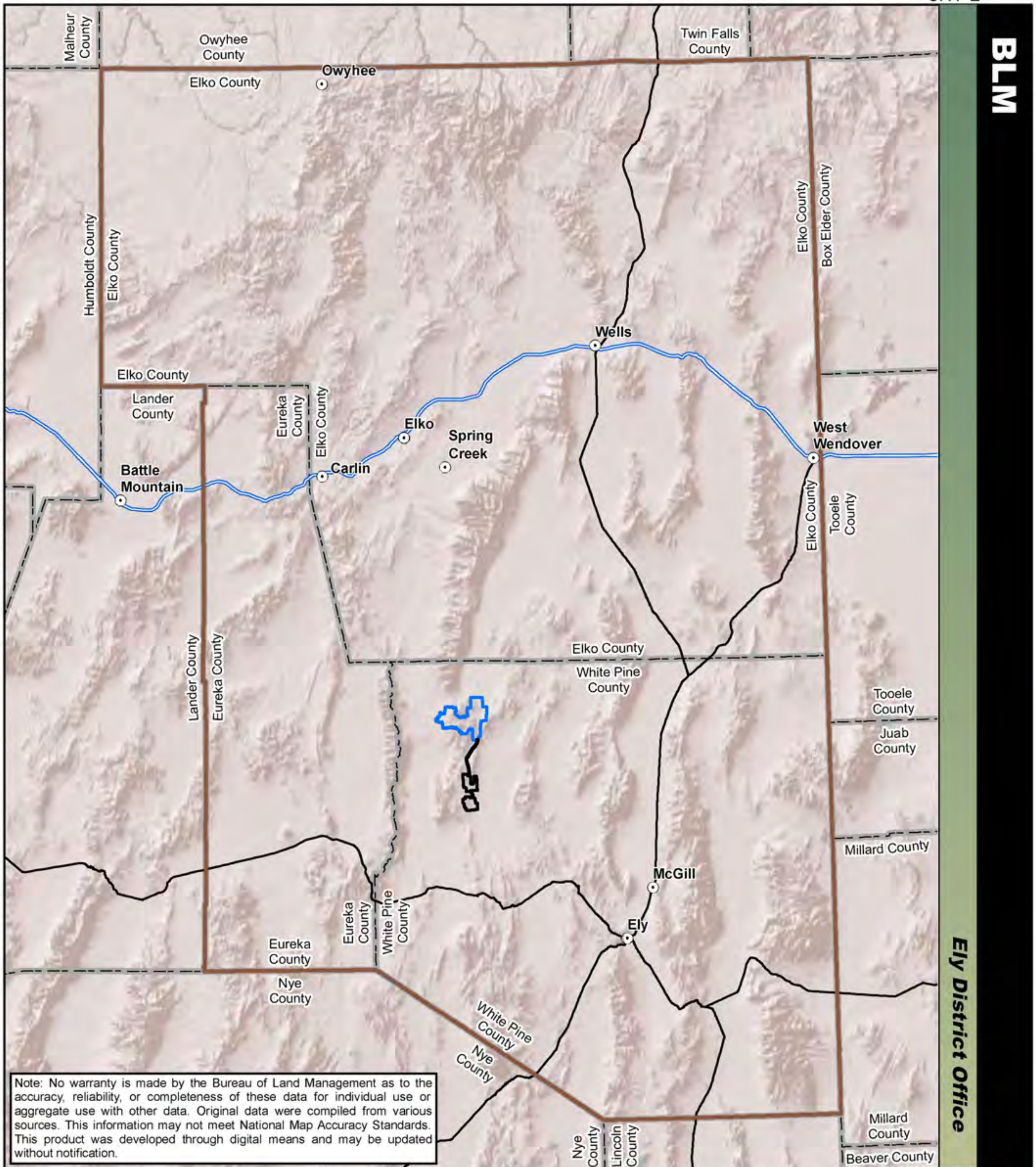

Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Social and Economic Values and Environmental Justice Study Area and Cumulative Effects Study Area
- City or Town

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.17-1

Social and Economic Values and Environmental Justice Study Area and Cumulative Effects Study Area

0 7.5 15 30 Miles

N

Source: Barrick 2012a,b; BLM 2012a.

5/20/2015

Workers typically choose a residence location based on some combination of job proximity, housing availability, and access to public and private services. Currently, much of the mining work force in northeast Nevada mines resides in the Elko vicinity because it is the most accessible community with a broad selection of services and housing. Over 80 percent of the population of the three-county study area lives in Elko County.

Table 3.17-2 summarizes race and ethnicity by county. A detailed discussion on race and ethnicity is presented in Section 3.18.1.1, Minority Population.

Table 3.17-2 Race and Ethnicity by County

Race and Ethnicity	Elko County (%)	Eureka County (%)	White Pine County (%)	State of Nevada (%)
White Not of Hispanic Origin	69.1	83.6	76.3	54.1
Black Not of Hispanic Origin	0.7	0.1	3.9	7.7
American Indian, Eskimo or Aluet	4.7	2.1	3.8	0.9
Asian or Pacific Islander Non-Hispanic	1.0	0.9	1.1	7.7
Other and Two or More (Mixed) Races	1.7	1.3	1.8	3.1
Hispanic Origin of Any Race	22.9	12.0	13.2	26.5

Source: U.S. Census Bureau 2010b.

3.17.1.2 Income

Average mining wages and salaries are the highest for any industry in Nevada, averaging $77,321 in 2011, more than 79 percent higher than the all industries average of $43,105 (Nevada Department of Employment, Training & Rehabilitation [NDETR] 2013). The differential holds true for counties within the study area, with average natural resources and mining wages reported at $82,140 in Elko County, $87,970 in Eureka County, and $132,833 in White Pine County. All-industry average wages were reported at $46,119 in Elko County, $85,950 in Eureka County, and $46,225 in White Pine County, although the Eureka County figure is heavily skewed because 94 percent of all employment in the county is mining-related (NDETR 2013). No other industry sector comes within $14,000 of matching mining industry wages.

As noted the Final EIS for the Bald Mountain Mine North Operations (BLM 2009a), in 2007, the average cost with benefits per employee at the Bald Mountain Mine was $107,000, well above the median household income and per capita income in the three counties.

Although mining wages and salaries are typically higher than average, per capita personal income (PCPI) in the study area lagged slightly behind the state level for many years; however, current data indicate that PCPI within the counties in the study area now exceed the state average. Data from 2000 indicated a state average of $30,977. Average PCPI for counties within the study area in 2000 was $25,419 (82.1 percent of the state level) in Elko County, $23,684 (76.5 percent of the state level) in Eureka County, and $25,577 (82.6 percent of the state level) in White Pine County (Bureau of Economic Analysis [BEA] 2013). By 2011, the state PCPI had risen to $36,964, an increase of 19 percent. The average PCPI for counties within the study area was $40,150 for Elko County, $38,071 for Eureka County, and $39,955 for White Pine County. PCPI now exceeds the state average in each of the three counties within the study area (BEA 2013).

In concert with PCPI, estimated median household incomes in all three counties within the study area were above the statewide household income level in 2011. The median household income for the state in 2011 was estimated at $49,099, compared with $62,937 for Elko County (28.2 percent above the state level), $58,985 for Eureka County (20.1 percent above the state level), and $52,014 for White Pine County (5.9 percent above the state level (NDETR 2013).

According to the U.S. Department of Commerce, an estimated 10.7 percent of Elko County's population was living below the poverty threshold in 2011, an increase from 7.5 percent in 2008. For Eureka County, an estimated 9.6 percent of the population was living below the poverty threshold in 2011, down slightly from 10.0 percent in 2008. For White Pine County, an estimated 14.1 percent of the population was living below the poverty threshold in 2011, up from 13.5 percent in 2008. All of these percentages were lower than the Nevada statewide rates of 15.2 percent in 2011. Only White Pine County exceeded the statewide rate (11.2 percent) in 2008. Poverty rates for children and youth under 18 followed a similar pattern. Rates increased in all three counties between 2008 and 2011, but remained below the statewide average rate with the exception of White Pine County in 2008 (U.S. Census Bureau 2013).

3.17.1.3 Economy and Employment

The study area is a major contributor to Nevada's mining industry. In 2007, the University Center for Economic Development (UCED) at the University of Nevada, Reno conducted an Analysis of the Economic Impact of the Hard Rock Mining Sector on the Elko Micropolitan Statistical Area[1] (Price and Harris 2007). The study noted that in 2004, the counties of Elko and Eureka, which collectively comprise the Elko Micropolitan Statistical Area (SA), recorded a value of output of $1.58 billion for the gold, silver, and other metal ore mining sector. This was approximately 44 percent of total Elko Micropolitan SA value of output and the #1 output value ranking of all of the SA's 146 economic sectors (Price and Harris 2007). In the first quarter 2007, the gold, silver, and other metal ore mining sector had an estimated value of production level of $2.03 billion (Price and Harris 2007). Using information from the first quarter of 2007 and IMPLAN microcomputer input-output software, the study concluded that given the economic inter-linkage and multiplier effect, total output impacts to the Elko Micropolitan SA economy from activities by the gold, silver, and other metal ore mining sector was $2.63 billion. While the Elko Micropolitan SA only includes two of the three counties within in the Socioeconomics study area, it does serve to illustrate the relative contribution of the gold, silver, and other metal ore mining sector to the economy within the study area.

Table 3.17-3 illustrates a comparison of the three counties' employment by major industry with statewide employment by the same sectors. As listed in **Table 3.17-3**, the combined natural resources and mining sector employment in the three counties make up more than half of the total state employment in that economic sector; a large majority of the sector statewide is devoted to metal mining. All of the counties within the study area are substantially more dependent on mining than is the state as a whole. The employment numbers are based on place of work, not place of residence, which explains why Eureka County has more employees in the natural resources and mining sector than it has residents. Several major mines on the Carlin Trend are located in Eureka County, but most of those workers live in Elko County, as noted above. Elko County is notably more economically diverse than the other two counties with a larger and broader selection of services, particularly in the City of Elko, the largest community in the study area. Elko has a substantial casino and hospitality industry and offers a variety of other services, which notably broadens its employment base. White Pine County, with the City of Ely, also is more diverse in its employment than Eureka County, but with a smaller base of employment and, consequently, a less extensive complement of available services.

[1] In 2003, the U.S. Bureau of Census defined a new classification of counties which are designated as "Micropolitan Statistical Areas." To be classified as a Micropolitan Statistical Area (SA), a group of counties must have a community of at least 10,000 to 49,999 people, be distant from a large city, and have proportionately few residents commuting outside the area. The counties of Elko and Eureka comply with these requirements and have been designated as the Elko Micropolitan SA (Price and Harris 2007).

Table 3.17-3 Non-agricultural Wage and Salary Employment by Sector in 2012[1]

	State of Nevada		Elko County		Eureka County		White Pine County	
Sector	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Goods Producing - Private	**101,500**	**8.1**	**4,910**	**23.0**	**4,150**	**93.3**	**1,370**	**18.0**
Natural Resources and Mining	15,667	1.3	3,060	14.3	4,150	93.3	1,090	14.3
Construction	48,500	3.9	1,600	7.5	*	0.0	250	3.3
Manufacturing	37,333	3.0	250	1.2	*	0.0	30	0.4
Service Providing - Private	**877,717**	**70.1**	**13,890**	**65.0**	**210**	**4.7**	**1,540**	**20.3**
Trade, Transp. & Utilities	211,567	16.9	4,060	19.0	160	3.6	510	6.7
Information	12,950	1.0	150	0.7	*	0.0	20	0.3
Financial Activities	50,850	4.1	450	2.1	*	0.0	80	1.1
Prof. & Business Services	140,550	11.2	1,500	7.0	10	0.2	140	1.8
Educational and Health Services	104,883	8.4	1,360	6.4	*	0.0	170	2.2
Leisure and Hospitality	322,967	25.8	5,750	26.9	40	0.9	540	7.1
Other Services	33,950	2.7	620	2.9	*	0.0	80	1.1
Unclassified[2]	**0**	**0.0**	**10**	**0.0**	**80**	**1.8**	**0**	**0.0**
Subtotal - Private	**979,217**	**78.2**	**18,810**	**88.0**	**4,440**	**99.8**	**2,910**	**38.3**
Service Providing - Public	**147,917**	**11.8**	**3,760**	**17.6**	**230**	**5.2**	**1,360**	**17.9**
Government	147,917	11.8	3,760	17.6	230	5.2	1,360	17.9
Subtotal - Public	**147,917**	**11.8**	**3,760**	**17.6**	**230**	**5.2**	**1,360**	**17.9**
TOTAL	**1,127,134**	**90.0**	**22,570**	**105.6**	**4,670**	**104.9**	**4,270**	**56.2**

1 2012 6-month averages.

2 County unclassified numbers include aggregated data not released by industry for reasons of confidentiality.

* Confidential data.

Source: NDETR 2013.

The combined labor force in the three counties is currently estimated at 37,541; approximately 35,188 of whom are employed. The remaining 2,353 unemployed individuals represent a 6.3 percent unemployment rate. This level is notably lower than both the 11.6 percent statewide unemployment rate and the 8.1 percent national rate (NDETR 2013). Unemployment rates for all three counties have declined from their recent highs, but have not yet reached their pre-recession levels. A potentially important consequence of the current unemployment rates is the availability of up to 2,300 workers for any available jobs related to the proposed NOA and SOA projects.

As reported in the Analysis of the Economic Impact of the Hard Rock Mining Sector on the Elko Micropolitan Statistical Area (Price and Harris 2007), the gold, silver, and other metal ore mining sector in the Elko Micropolitan SA had labor income of $346.2 million. This was approximately 31 percent of total Elko Micropolitan SA labor income and the #1 labor income ranking of 146 economic sectors (Price and Harris 2007). In the first quarter 2007, the gold, silver, and other metal ore mining sector had an estimated paid labor income of $452.8 million (Price and Harris 2007). The study concluded that given the economic inter-linkage and multiplier effect, the total labor income impacts was $624.9 million.

As noted the Final EIS for the Bald Mountain Mine North Operations (BLM 2009a), in 2007, the Bald Mountain Mine payroll was approximately $23.1 million. Of this total, an estimated $14,784,000 was paid to residents of Elko County, $5,082,000 was paid to residents of White Pine County, and $3,234,000 was paid to residents of Eureka County. Purchases of materials and services for mine operations in 2007 totaled approximately $23,000. A portion of this total would generate sales tax revenue for the state and counties, depending on the actual location of the sales (BLM 2009a). The IMPLAN analysis used in the Final EIS estimated that at maximum capacity, the value of direct, indirect, and induced annual labor income from the Proposed Action was $9.9 million in 2006 dollars.

A specific area of economic concern for the proposed Project is the potential for affecting the economic activity generated by big game hunting in Nevada. Statewide, it is estimated that hunters spent $204 million in Nevada in 2011, including approximately $87 million of trip-related expenditures and approximately $117 million for equipment and “other” expenses (U.S. Department of the Interior et al. 2013). It is further estimated that big game hunting accounted for approximately 70 percent of the total hunting expenditures, which would be approximately $143 million (U.S. Department of the Interior et al. 2013). While the survey did not differentiate expenditures among species being hunted, deer typically account for the largest number of licenses among the big game species in Nevada at approximately two-thirds of the total. There were 14,862 deer tags issued statewide in 2011; 3,694 (24.9 percent) of these were issued in Management Area 10, which includes the project study area. The numbers of tags vary from year-to-year, but over the past decade, Management Area 10 has ranged from 22.9 percent to 33.81 percent of the statewide total, averaging 26.5 percent (NDOW 2014b). If it assumed that the dollars approximately follow the tag counts, two-thirds of the big game tally would be approximately $95 million for deer; 26.5 percent of which would indicate Management Area 10 accounts for approximately $25 million of hunting expenditures per year (or about $6,750 per deer tag). NDOW (2011d) estimates local and state tax revenues from hunting-related retail sales at approximately 8.1 percent, which would produce up to $7.7 million from deer hunting statewide and up to $2.0 million per year in revenue from Management Area 10 deer hunting. These numbers are based on broad, general assumptions, but they provide a general sense of the annual economic activity generated by deer hunting in Management Area 10. The survey data do not provide sufficient information to discern how much of the expenditures would occur in or near the study area as, for example, hunters may purchase firearms, ammunition, off-road vehicles, and other equipment elsewhere for use in local hunting. The survey data also do not indicate whether there are additional benefits from indirect and induced economic activity related to hunting, although it is assumed that the reported expenditures only include direct expenditure dollars.

3.17.1.4 Housing

The 2010 census found 25,140 housing units within the 3 counties in the study area: 19,566 units (approximately 78 percent) were in Elko County; 1,076 units were in Eureka County; and 4,498 units were in White Pine County (**Table 3.17-4**). At the time of the census, 21,985 of the housing units were occupied, leaving 3,155 (12.5 percent) vacant. In Elko County, for example, 17,442 units, were occupied in 2010 and 2,124 (10.9 percent) were vacant. However, the overall vacancy rate can be misleading; however, as some portion of the vacant units were for seasonal, recreational or occasional use and not readily available for people seeking housing.

Vacancy rates were at an extremely low 1.3 percent in homeowner units, but a notably higher 10.2 percent in rental units (U.S. Census Bureau 2010b). Vacancy rates varied geographically as well as by type. The Spring Creek area had a 95.7 percent occupancy rate, while Elko was at 93.4 percent and Carlin was at 84.6 percent. The vacancy rates for just homeowner units ranged from a very tight 0.9 percent in Elko to 3.3 percent in Eureka County; the overall rate was just 1.4 percent for the

3 counties in the study area. Vacancy rates for rental units ranged from 4.6 percent in the Spring Creek area to 21.3 percent in Carlin, with a three-county rate of 9.9 percent.

Short-term housing opportunities in the study area are amply available. Elko is home to 31 motels, hotels, and casinos hosting over 2,000 rooms. There are several mobile home parks and six recreational vehicle (RV) parks in the city with approximately 500 spaces. There are several campgrounds in the surrounding area, several of which are on BLM-administered lands. Carlin has a 61-room Comfort Inn and two small, older motels plus limited opportunities for weekly rentals. There are 19 hotels, motels, and bed and breakfasts in Ely and four more in nearby communities of Baker and Preston. There also are 11 RV parks and campgrounds in the vicinity. There are 4 hotels in Eureka as well as a number of RV spaces.

Table 3.17-4 Housing Vacancy Rates in 2010

	Housing Units				Vacancy Rate by Type (%)	
Geographic Area	**Total**	**Occupied**	**Vacant**	**Vacancy Rate (%)**	**Homeowner Units**	**Rental Units**
City of Elko	7,221	6,743	478	6.6	0.9	6.9
Spring Creek CDP[1]	4,394	4,204	190	4.3	1.2	4.6
City of Carlin	1,043	882	161	15.4	1.0	21.3
Elko County	19,566	17,442	2,124	10.9	1.3	10.2
Eureka CCD	699	552	147	21.0	2.6	8.6
Eureka County	1,076	836	240	22.3	3.3	11.9
City of Ely	2,185	1,856	329	15.1	3.2	9.3
White Pine County	4,498	3,707	791	17.6	2.5	8.9

[1] CCD = Census County Division; CDP = Census Designated Place.

Source: U.S. Census Bureau 2010b.

3.17.1.5 Community Facilities and Services

Public Utilities

Water

The City of Elko obtains municipal water from 18 deep-water wells, and has 25 million gallons of storage capacity. The system has a maximum production capacity of 14.5 million gallons per day (mgd) with current usage ranging from 3 mgd to a peak of 13 mgd. Spring Creek residents are served by nine public wells. Carlin obtains water from one deep-water well and several natural springs, water is stored in a 2-million-gallon tank. Peak production capacity is 1.4 mgd; averaging approximately 1 mgd.

The City of Ely provides water and sewer service within city boundaries and supplies water to some areas adjacent to the city. Ely's water system relies on groundwater sources, including two dewatering wells associated with the Robinson open pit mine and five additional wells. Water quality is generally good. The water system includes 5 storage tanks with a total capacity of 8 million gallons. Supply capacity is sufficient for the needs of the system. If the Robinson Mine source should lost, there might be a need to limit summer irrigation to alternate days, although tests in recent years have indicated supply from the other five wells should be sufficient (Municipal Water Department 2013).

The water systems in Eureka and nearby Devil's Gate Districts #1 and #2 are managed by the county Public Works Department. The Eureka system produces water from 2 wells, pumping it to 3 storage tanks with a total capacity of 2,350,000 gallons. A recent spring rehabilitation project above the town has augmented Eureka's supply from numerous springs. The Devil's Gate system consists of 2 wells, pumps, a 250,000-gallon storage tank, and distribution system.

Wastewater

Elko and Carlin have wastewater treatment facilities. The "fixed film" biological treatment plant averaging 3.5 mgd is located in Elko. Approximately 60 percent of treated water is reused for irrigation. Carlin employs two lagoons with rapid infiltration basins. Wastewater treatment in Spring Creek utilizes private septic systems.

Ely treats wastewater with an activated sludge treatment plant primarily to reduce nitrogen from the wastewater stream. Effluent achieves very good compliance with water quality standards (Municipal Water Department 2013). The wastewater system has capacity for current needs plus potential growth; it currently operates at approximately 60 percent of capacity.

The Eureka Waste Water Treatment Facility, managed by Eureka County's Public Works Department, treats waste water for the Town of Eureka. The facility is permitted to discharge up to 100,000 gpd and has only a modest amount of unused discharge capacity currently.

Solid Waste

The City of Elko operates a regional solid waste landfill. At current use rates, it has capacity to last until at least 2092.

The City of Ely operates a regional solid waste landfill on the northwest edge of the city, which is permitted for both municipal waste and construction waste. The available capacity is being used faster than expected, but the current estimated closure date is in 2050, and an alternative site will be needed to accommodate future demand.

Eureka County Public Works operates a landfill west of town. Current capacity is expected to be sufficient until approximately 2035 under current conditions, and the county is exploring additional capacity via acquisition of additional land from the BLM or vertical expansion of the current landfill through a permit modification through NDEP.

Energy

Electricity is provided to residents in the City of Elko and some surrounding portions of the study area in Elko County by Nevada Power; natural gas is provided by Southwest Gas Corporation.

Mount Wheeler Power, a rural electric cooperative, serves all of White Pine County, southeastern Eureka County and portions of southern Elko County. The service area includes the City of Ely and the Town of Eureka. There is no natural gas service in Eureka County or White Pine County; propane is supplied by private companies. White Pine County also has private heating oil and coal suppliers.

<u>Public Safety</u>

Law Enforcement

Law enforcement, detention and emergency dispatch services for unincorporated Elko County are provided by the County Sheriff. Elko and Carlin police departments provide law enforcement for their respective incorporated jurisdictions. The Bureau of Indian Affairs Police are responsible for the 193-acre Elko Band Colony. The Eureka County Sheriff provides law enforcement, detention and emergency dispatch services for all of Eureka County. The White Pine County Sheriff is responsible for law enforcement, detention and emergency dispatch services in rural White Pine County. The sheriff also serves as the chief of police for the City of Ely under a cooperative agreement; Ely's police department provides law enforcement within the city. The Duckwater Reservation has its own small police department. The Nevada Highway Patrol provides law enforcement on the state highway system and provides support to other law enforcement agencies.

Fire Protection

Fire protection services are provided by numerous agencies throughout the study area. The Elko City Fire Department, Carlin City Volunteer Fire Department, BLM, USFS, and Northeastern Fire Protection Department of the Nevada Division of Forestry provide fire protection in Elko County. These departments are all involved in mutual aid cooperative agreements. The Elko City Department is the largest of the agencies with 3 staff positions and 15 career firefighters supported by 34 volunteer positions. The department has 10 major pieces of equipment, including 7 regular engines, 2 smaller specialty trucks, and 1 specialized airport engine. The department also houses four pieces of Nevada Department of Forestry firefighting equipment. The Carlin Volunteer Fire Department primarily serves the city and surrounding area with fire protection and ambulance services with a volunteer crew of 33.

White Pine County fire protection services are provided by the City of Ely Fire Department and a county-wide fire district with volunteer units in several smaller communities in the county. The Ely Fire Department is operated by a combination of 5 full-time, paid firefighters and approximately 31 volunteer firefighters providing protection for the City of Ely. A majority of the private lands in White Pine County are included in the Nevada Division of Forestry White Pine County Fire Protection District. The District is managed by a Battalion Chief; volunteer departments in smaller communities in the county are operated under the auspices of the district.

Eureka County does not have a county fire department, but it provides funding, a full time battalion chief, facilities, equipment, training and supplies for four volunteer departments in communities throughout the county. The Eureka Volunteer Fire Service (VFS) provides fire protection services in the town and surrounding area. The VFS is staffed entirely by approximately 25 volunteers with a fleet of 8 vehicles: 2 structure engines, a 3,800-gallon water tender, 3 brush fire trucks, a rescue/extraction truck, and a pumper truck for use in the town.

In addition to the local fire departments, the BLM, USFS, and Northeastern Fire Protection Department of the Nevada Division of Forestry provide fire protection, primarily in outlying areas where they are primarily responsible for fighting wildland fires. The Nevada Division of Forestry received legislative approval in 2013 for an enhanced Wildland Fire Protection Program, which "allows the State to provide financial assistance with wildland fire costs, increased suppression resources and coordination, incident management assistance, and technical expertise to participating counties during a wildfire" (Nevada Division of Forestry 2014). Local, state, and federal agencies are all involved in mutual aid/cooperative agreements, supporting each other as appropriate and as needed, depending on the circumstances of each fire.

Emergency Medical Services

The Elko County Ambulance Service provides ambulance service throughout the county with ambulance units located in Elko, Wells and Jackpot. The certified service operates 24 hours per day with a staff of paramedics, Emergency Medical Technicians, and volunteers. In addition to ground ambulances, there are fixed wing and helicopter air ambulance stationed at the Elko airport.

White Pine County emergency medical service ambulances are based at the Emergency Response Complex in Ely. Staffing is provided by volunteer Emergency Medical Technicians with back-up from fire department first responders.

The Eureka County Emergency Medical Service provides emergency services throughout the county. Ambulances are based in three locations, including in the Town of Eureka. Staffing in the Eureka area includes 2 paid, full-time employees, including an Emergency Medical Service coordinator and approximately 14 volunteers.

Health Care

The Northeast Nevada Regional Hospital in Elko is the principal health care facility for all of northeastern Nevada. It provides 24-hour emergency care and has 75 acute care rooms. The hospital has a full service laboratory, an intensive care unit, both magnetic resonance imaging and computerized axial tomography scan capabilities, and provides most major medical specialty services (Northeast Nevada Regional Hospital 2013). The hospital also provides services to the Elko Band Colony Health Center under an Indian Health Service contract.

The Carlin Community Health Center is one of a series of federally supported clinics providing health care to medically underserved areas operated by Nevada Health Centers, a private, non-profit organization. The Carlin clinic is staffed by physicians, physician assistants and nurse practitioners. The center provides service in family medicine, preventative health, women's health, children's health and immunizations, health education, prenatal and newborn care, and pharmacy services.

The William Bee Ririe Hospital in Ely is an accredited critical access hospital providing a full range of health care for the Ely/White Pine County area. The hospital provides both intensive care and general care services ranging from state of the art diagnostic services to emergency care, surgery, and recuperative therapies. The hospital also operates a rural health clinic in Ely.

Eureka County supports two diagnostic and treatment centers through contracts with Nevada Rural Health Services. It also funds ambulance/emergency medical technician services in coordination with the volunteer fire departments. There is no hospital in Eureka County; persons needing hospital or medical services beyond the capabilities of the diagnostic centers are transported to Elko or Ely or other regional facilities by air ambulance.

3.17.1.6 Education

Elementary and secondary schools in the study area are operated by the Elko, Eureka and White Pine county school districts.

Elko County School District. With administrative offices in Elko, the Elko County School District is by far the largest of the three with over 9,500 students in the 2010-2011 school year and more than 10,000 in the 2012-2013 school year (**Table 3.17-5**).

Table 3.17-5 Public Schools Enrollment History

School District/ Year	Enrollment by Grade Level[1]						Gain/ Loss Over Prior Year (%)
	Pre-Kindergarten[2]	Kindergarten	Elementary (1-6)	Secondary (7-12)	Ungraded[3]	Total	
Elko County School District							
2008-2009	65	676	4,441	4,470	17	9,669	-1.4
2009-2010	78	754	4,225	4,407	10	9,474	-2.0
2010-2011	75	780	4,245	4,446	10	9,556	0.9
2011-2012	63	823	4559	4517	10	9,972	4.4
2012-2013	128	874	4564	4492	14	10,072	1.0
5-Year Net Change							4.2

Table 3.17-5 Public Schools Enrollment History

School District/ Year	Enrollment by Grade Level[1]						Gain/ Loss Over Prior Year (%)
	Pre-Kindergarten[2]	Kindergarten	Elementary (1-6)	Secondary (7-12)	Ungraded[3]	Total	
Eureka County School District							
2008-2009	0	14	100	125	3	242	2.5
2009-2010	13	16	106	125	0	260	7.4
2010-2011	10	19	92	118	0	239	-8.1
2011-2012	21	14	102	115	1	253	5.9
2012-2013	20	26	106	119	0	271	7.1
5-Year Net Change							12.0
White Pine County School District							
2008-2009	34	101	617	680	0	1,432	-0.8
2009-2010	31	99	627	685	0	1,442	0.7
2010-2011	42	97	599	686	1	1,425	-1.2
2011-2012	40	116	603	641	1	1,401	-1.7
2012-2013	13	123	632	651	1	1,420	1.4
5-Year Net Change							-0.8

1 Enrollments at the end of the first school month.

2 Pre-Kindergarten refers to 3 and 4 year olds receiving special education (NAC 388.490).

3 Ungraded refers to a student enrolled in a non-graded class in a school for special education or a student who cannot be assigned to a particular grade because of the nature of his or her condition (NAC 387.111).

Source: Nevada Department of Education 2013.

Eleven of the district's schools are located in the Elko-Spring Creek-Carlin area. Elko has four elementary schools, one junior high, and one high school. Spring Creek has two elementary schools, one middle school, and one high school. Carlin has a combined school for elementary through high school. The district had an overall ratio of 17.2 students per teacher in the 2010-2011 school year.

Students from the Elko Band Colony attend Elko District schools. There also is a Head Start Program at the Colony for children from 3 to 5 years old.

The White Pine County School District, headquartered in Ely, had approximately 1,425 students in the 2010-2011 school year, dropping only slightly to 1,420 in the 2012-2013 school year. White Pine had 16.5 students per teacher in the 2010-2011school year. The White Pine district has three elementary schools, one middle school, two high schools and one K-12 school located in Lund.

Eureka County School District is the smallest of the three districts with fewer than 300 students. The student population has grown by 13.3 percent from 2010-2011 to 2012-2013. The district had just 9.3 students per certified teacher in 2010-2011. The district has one elementary school in Crescent Valley and one elementary school and one high school in Eureka. High School students from the Duckwater Indian Reservation in the northeast corner of Nye County are transported to Eureka for high school, although the reservation has its own elementary-middle school under the jurisdiction of the Nye County School District.

As **Table 3.17-5** illustrates, the Elko County School District has experienced substantial enrollment growth in the last 3 years, reaching its highest enrollment level since the national recession began. The Eureka County School District also has seen notable growth, albeit from a much smaller base. Enrollment in the White Pine County School District has fluctuated, but remained in a narrow range.

The primary provider of higher education opportunities to residents in the study area is Great Basin College (GBC). The college, a pioneer in distance learning techniques, serves nearly 4,000 students in six of Nevada's largest rural counties (GBC 2008). Its main campus, and only residential facility, is located in Elko. GBC also has a branch center with extensive course offerings in Ely and satellite centers with limited offerings in Eureka, Carlin and more than 20 other communities throughout Nevada.

In addition to Great Basin College, the University of Nevada, Reno Fire Science Academy (FSA) is located at Carlin. The FSA is purported to be "one of the finest emergency response programs and training facilities in the world" (FSA 2008). It offers highly specialized training in emergency response and emergency management.

3.17.1.7 Public Finance

There are six main general governmental entities influencing the study area: Elko, Eureka, and White Pine counties, and the cities of Elko, Carlin, and Ely. The Town of Eureka is an unincorporated community overseen by the Eureka County Commissioners. Elko County has a professional county manager and a five-member Board of Commissioners, who oversee the operations of the county, including administration, law enforcement, courts and public works. Eureka County operates with a three member Board of Commissioners, who function as both policy makers and administrators, with department heads and supervisors taking direction from the Commissioners as the main county administrators. White Pine County has a 5-member Board of Commissioners, providing both policy and administration. Both the City of Elko and the City of Carlin employ council-manager governmental structures with professional city managers and policy making City Councils, each made up of a directly elected Mayor and four Council Members. The City of Ely has a similar Council-Manager form of government, but with five council members plus the mayor. The Town of Eureka does not have a separate governing board; it is under the jurisdiction of the county board.

Local government finance in Nevada is a complex admixture of locally derived and state shared revenues. Local revenues are primarily *ad valorem* property taxes on real and personal property and the net proceeds of mines in the jurisdiction. They also collect revenues from fines, licenses and permits, and fees for services. State shared revenues, designated as intergovernmental resources in **Tables 3.17-6** and **3.17-7**, include sales, motor vehicle, fuel and gaming taxes. State revenue sharing addresses significant economic disparities between the relatively wealthy urban centers of Reno and Las Vegas and the often less affluent rural agricultural and mining communities (Nevada Department of Taxation 2013).

Elko, Eureka and White Pine counties have approved deficit operating budgets for fiscal year (FY) 2012-2013, showing anticipated annual revenues potentially falling short of anticipated annual expenditures. In the event these shortfalls would occur, the counties would tap reserves to balance their budgets, as required by statute (**Table 3.17-6**). Elko County anticipated revenues of $41.2 million against planned expenditures of $59.7 million, resulting in an expected deficit of $18.4 million. Eureka County anticipated revenues of $15.2 million and expenditures of $35.6 million. White Pine County expects revenues of $19.7 million and expenditures of $23.8 million.

Two of the three study area cities and the Town of Eureka have similarly constructed budgets for the FY 2012-2013 with shortfalls in anticipated revenues compared with expenditures (**Table 3.17-7**). The City of Elko's FY 2012-2013 budget anticipates revenues of $22.7 million and expenditures of $26.5 million, producing a $3.9 million deficit. The much smaller City of Carlin planned revenues of $2.6 million and expenditures of $3.0 million, leaving a $0.4 million deficit. The Town of Eureka budget, prepared by the County Board, anticipates revenue of $108,173 and expenditures of $118,400, resulting in a $10,227 deficit. The City of Ely is the only entity that has budgeted for a surplus in FY 2012-2013. Ely expects revenue of $2.58 million against expenditures of $2.57 million, which would produce a small surplus of $14,103.

Table 3.17-6 County Budgets for Fiscal Year 2012-2013

Governmental Fund Types and Expendable Trust Funds ($)	Elko County	Eureka County	White Pine County
Revenues			
Property Taxes	12,545,451	5,109,733	4,323,270
Other Taxes	14,000	164,047	5,560,604
Licenses and Permits	855,000	8,750	189,290
Intergovernmental Resources	21,913,833	8,049,750	7,439,439
Charges for Services	3,242,520	1,284,470	822,150
Fines and Forfeits	1,380,200	86,900	414,400
Miscellaneous	1,274,800	465,455	970,400
Total Revenues	41,225,804	15,169,105	19,719,553
Expenditures			
General Government	12,309,445	11,978,230	4,617,523
Judicial	11,209,806	1,759,850	4,792,082
Public Safety	14,633,563	3494064	2,614,530
Public Works	9,157,378	8,647,500	3,599,743
Sanitation[1]	--	327,500	--
Health[1]	342,200	1,340,849	114,140
Welfare	3,145,218	57,500	700,126
Culture and Recreation	2,132,795	1,860,193	5,490,356
Community Support	2,528,829	1,435,663	749,549
Intergovernmental Expenditures	3,433,612	4,279,000	888,740
Capital Projects	--	--	--
Contingencies	450,000	400,000	250,000
Utility Enterprises	--	--	--
Hospitals	--	--	--
Transit Systems	--	--	--
Airports	--	--	--
Other Enterprises	--	--	--
Debt Service - Principal	302,916	--	--
Interest Cost	11,592	--	--
Total Expenditures	59,657,354	35,580,349	23,879,204
Excess Revenues Over (Under) Expenditures	(18,431,550)	(20,411,244)	(4,097,236)

[1] White Pine County combines Health and Sanitation into one line item; Elko County doesn't identify a Sanitation budget.

Sources: Nevada Department of Taxation 2013 (Schedules S-1 from local government entities' FY 2012 to 2013 budgets).

Table 3.17-7 City and Town Budgets for Fiscal Year 2012-2013

Governmental Fund Types and Expendable Trust Funds ($)	City of Elko	City of Carlin	Town of Eureka	City of Ely
Revenues				
Property Taxes	3,676,885	312,789	21,173	--
Other Taxes	3,279,818	100,000	--	76,000
Licenses & Permits[1]	1,780,260	70,000	1,500	307,000
Intergovernmental Resources	12,544,743	1,816,577	83,500	1,915,263
Charges for Services	1,047,275	130,000	--	123,500
Fines and Forfeits	203,250	77,800	--	112,600
Miscellaneous	120,864	92,775	2,000	49,710
Total Revenues	22,653,095	2,599,941	108,173	2,584,073
Expenditures				
General Government	3,011,515	641,292	--	202,276
Judicial	508,032	83,125	--	244,616
Public Safety[2]	9,687,225	1,118,550	45,400	1,096,617
Public Works	7,227,066	392,133	70,500	514,540
Sanitation	--	--	--	--
Health[3]	659,495	99,596	--	229,190
Welfare[3]	--	--	--	--
Culture and Recreation	4,242,366	522,175	--	125,916
Community Support	30,000	56,828	--	--
Intergovernmental Expenditures	--	--	--	--
Capital Projects[4]	--	--	--	64,400
Contingencies	265,218	20,000	2,500	30,000
Utility Enterprises	--	--	--	--
Hospitals	--	--	--	--
Transit Systems	--	--	--	--
Airports	--	--	--	--
Other Enterprises	--	--	--	--
Debt Service - Principal	480,000	48,000	--	32,673
Interest Cost	411,324	15,000	--	29,742
Total Expenditures	26,522,241	2,996,699	118,400	2,569,970
Excess Revenues Over (Under) Expenditures	(3,869,146)	(396,758)	(10,227)	14,103

[1] Includes electrical franchise fee for Ely.

[2] Includes Fire Protection line item for Ely.

[3] Elko combines Health and Welfare into a single line item.

[4] Includes Street Improvements line item for Ely.

Sources: Nevada Department of Taxation 2013 (Schedules S-1 from local government entities' FY 2012 to 2013 budgets).

In all of the deficit budget jurisdictions, unreserved fund balances are available that would be sufficient to cover the budgeted shortfalls, although, in some cases, the reserve funds would be substantially reduced if the budgeted shortfalls should actually occur. Elko County, as an example, chooses to budget conservatively by underestimating revenue for the forthcoming year and appropriating “every dime” for expenditures (Elko County 2008). The county’s experience with this approach has been that, at the end of a FY, actual revenue has exceeded their projections and expenditures for most funds rarely reach the appropriated levels (Elko County 2008). The result has been that the county’s ending fund balance has held firm or only declined modestly in recent years (Elko County 2008). If the year’s revenue and expenditure streams should play out close to the budgeted amounts, Elko County’s unreserved fund balance would drop from over $21 million to under $3 million, although indications are that the actual decline would be substantially smaller. After covering budgeted deficits, Eureka County would still have an unreserved fund balance of over $25 million and White Pine County would have an unreserved fund balance of over $29 million.

The largest revenue sources for the county governments are projected to be property taxes and intergovernmental transfers, and in the case of White Pine County, “other” taxes. Intergovernmental transfers are by far the largest source of revenues for the cities and the Town of Eureka. Expenditure emphases vary notably among jurisdictions as illustrated in **Tables 3.17-6** and **3.17-7**.

Eureka County has experienced substantial increases in its property tax base from FY 2011 to FY 2013, due entirely to a near doubling of net proceeds of mines. Total assessed valuations for Elko County and White Pine County have grown only slightly over the same period. All three counties benefit from taxes on net proceeds of mines, but Eureka County’s budget benefits to a much greater degree than either of the other two. Net proceeds of all mines constitute over 70 percent of the total assessed valuation in Eureka County, but slightly less than 19 percent of Elko County’s assessed valuation and slightly over 23 percent of White Pine County’s assessed valuation.

Ad valorem tax rates vary substantially amongst the counties within the study area. Elko County’s *ad valorem* tax rate was $0.8386 per $100 of assessed value for FY 2012-2013; Eureka County’s rate was a similar $0.8458 per $100 of assessed value. White Pine County’s rate was more than double those rates at $1.951 per $100 of assessed value.

Sales tax rates in Nevada counties held constant at 6.5 percent in most rural counties for several years, but increased after the Legislature raised the local school support tax from 2.25 percent to 2.60 percent in 2009. Both Elko and Eureka counties now collect sales and use taxes at a 6.85 percent rate; and White Pine County collects sales and use taxes at a 7.725 percent rate. The proposed NOA and SOA projects would likely purchase materials and services in both Elko County and White Pine County, generating sales and use tax payments to both. Of the total sales and use tax payments, a portion (2 percent of the 6.85 percent collected) goes to the state general fund and 2.6 percent goes to school districts. The county where the tax is generated receives 0.5 percent, and the remaining 1.75 percent is distributed to all counties under a statutory formula (Nevada Department of Taxation 2010).

3.17.1.8 Social Conditions

Elko, Spring Creek, and Carlin, in western Elko County, grew very rapidly in the 1980s, due to a boom in mining and related support activities, but stabilized in subsequent years when they experienced years of modest population growth and decline through about 2003. Growth resumed in recent years, but at moderated rates. The passage of time and the community’s ability to weather not only the booms, but subsequent downturns have allowed for development of a relatively stable social setting that now exists in Elko County. Many residents have lived in the area for a number of years, social ties have become established, and residents take pride in their communities. Many of the people place a high priority on maintaining informal lifestyles and small town traditions. Eureka County and White Pine County didn’t experience the boom that occurred in Elko County from 1980 to 1990 (**Table 3.17-1**). Growth in those two counties has been more moderate over the last three decades with a softening in the 1990 to 2000 period followed by modest increases in the growth rates subsequent to 2000. The City of Ely lost nearly 20 percent of its population from 1980 to 2000, but has rebounded slightly since 2000.

Gold prices continue to be a significant factor driving the growth or decline of the communities. When prices dropped in the late 1990s, workers were laid off, some mines announced early closures, and expansion plans were shelved, at least temporarily. As prices rose more recently, the reverse was true. Mines with available reserves implemented growth plans to take advantage of the opportunities. Subsequent price declines have shown early indications of reducing growth pressures once again. Although Elko County, in particular, is more diversified than it was two decades ago, the mining industry is still an important sector, affecting both the economy and the psychology of area communities. The historical dependency on natural resource extraction and production, relatively low population, distances separating communities, structure of local governance in rural Nevada, and issues associated with management of federal lands all influence social conditions, organization, and values in the planning area (BLM 2007b).

The study area has at least two population segments: long-term residents connected to the agricultural base or attracted to the quality of life, and a generally more mobile segment that reacts to job opportunities, particularly in the mining industry (BLM 2007b). With the relative stability in the mining economy in recent years, however, the distinction between long-term and more mobile populations has been less pronounced. One indicator of greater stability is the fact that violent crime rates throughout the three-county study area are notably lower than for Nevada as a whole with rates for all three counties at least 40 percent lower than the state rate.

3.17.2 Environmental Consequences

This section discusses project related impacts to social and economic values resulting from the Proposed Action, Reconfiguration Alternative, WRM Alternative, and No Action Alternative. Primary issues related to social and economic values include: 1) effects associated with potential changes in long-term local population, employment, or earnings associated with construction or operation of the proposed NOA and SOA projects; 2) potential project-related demands for housing and public services or infrastructure that would exceed capacities in these systems; 3) potential project-related effects on public sector fiscal conditions regarding demand for services compared to revenue generated; and 4) potential effects of the No Action Alternative relative to local work force and employment conditions.

As indicated in Chapter 2.0, the calendar years cited in the following discussion are approximate and could vary, depending on completion of permitting.

3.17.2.1 Proposed Action

Under the Proposed Action, construction of the proposed NOA Project is anticipated to begin in 2015; construction of the proposed SOA Project is anticipated to begin in 2016 (**Table 3.17-8**). Construction activities would occur in the proposed NOA for approximately 8 years beginning in mine year 1; construction activities would occur in the proposed SOA for approximately 5 years beginning in mine year 2. Construction employment would be inconsistent throughout the construction periods. The contractor work force would increase to approximately 120 contract workers for a 2-year period at the proposed NOA, overlapping the second year with the first year of 120 additional contractor workers employed at the proposed SOA (**Table 3.17-8**). At completion of initial construction phases, operations would begin with modest increases from current levels at the proposed NOA and an increase to a total of approximately 200 workers (including 10 contractors) at the proposed SOA. The total employment level would grow to a peak of approximately 782 in 2018, and would average approximately 664 from 2016 through 2024. Staff at the proposed NOA would be fairly consistently in the range of 400 to 450 workers – approximately 100 above current levels – for much of that time. Staff levels would be in

Table 3.17-8 Employment Estimates

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Existing																							
Salaried	65	65	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly	345	345	345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	410	410	410	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contractors	40	40	40		0	0																	
Subtotal w/Contr.	450	450	450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Proposed Action - North Operations Area																							
Salaried	0	0	0	70	70	70	70	70	69	68	68	67	68	68	48	47	46	46	42	35	19	3	3
Hourly	0	0	0	404	403	381	373	364	355	337	343	335	346	351	180	178	176	171	174	151	79	21	21
Subtotal	0	0	0	474	473	451	443	434	424	405	411	402	414	419	228	225	222	217	216	186	98	24	24
Contractors	0	0	0	120	120	20	20	20	20	120	20	120	20	20	20	20	20	20	20	20	20	0	0
NOA Subtotal w/Contr.	450	450	450	594	593	471	463	454	444	525	431	522	434	439	248	245	242	237	236	206	118	24	24
Proposed Action - South Operations Area																							
Salaried	0	0	0	0	4	21	21	20	20	17	18	12	1	1	0	0	0	0	0	0	0	0	0
Hourly	0	0	0	0	1	170	168	166	163	163	141	72	11	11	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0	0	5	191	189	186	183	180	159	84	12	12	0	0	0	0	0	0	0	0	0
Contractors	0	0	0	0	120	120	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0
SOA Subtotal w/Contr.	0	0	0	0	125	311	199	196	193	190	169	94	12	12	0	0	0	0	0	0	0	0	0
Proposed Action North Operations Area and South Operations Area Projects Combined																							
Salaried	65	65	65	70	74	91	91	90	89	85	86	79	69	69	48	47	46	46	42	35	19	3	3
Hourly	345	345	345	404	404	551	541	530	518	500	484	407	357	362	180	178	176	171	174	151	79	21	21
Subtotal	410	410	410	474	478	642	632	620	607	585	570	486	426	431	228	225	222	217	216	186	98	24	24
Contractors	40	40	40	120	240	140	30	30	30	130	30	130	20	20	20	20	20	20	20	20	20	0	0
Total	450	450	450	594	718	782	662	650	637	715	600	616	446	451	248	245	242	237	236	206	118	24	24

the range of 160 to 190 workers at the proposed SOA until 2024 when proposed SOA employment would taper off. Contractor employment would typically include 20 workers at the proposed NOA and 10 workers at the proposed SOA, except for temporary spikes to 120 workers at the proposed NOA in both 2022 and 2024 (**Table 3.17-8**). After 2026, most operations would taper off at the proposed SOA, and mining would end at the proposed NOA, although leaching, reclamation and closure activities would continue at proposed NOA, with operations winding down after 2036. It is expected that the project would effectively terminate at the end of 2036, except for reclamation and closure activities, which would continue through 2061. Long-term monitoring and fluid management activities would continue beyond that time as long as necessary.

Total employment would be at or above current levels through approximately 2026, dropping below current levels by over 200 workers from 2027 through 2032, before tapering down to a small monitoring staff by 2034.

Employment is one of the key driving forces in determining the social and economic effects of a proposed mine. In this case, with an existing mine in operation at the existing NOA, and several other Barrick operations in northeast Nevada, it is uncertain how many of the additional workers needed for the proposed NOA and SOA projects would be new hires and how many would be transfers from other operations. It may be that the needed workers would be all, or nearly all, new hires. At the opposite extreme many, or even most, of the workers may be transferred from current positions at other Barrick operations. The actual scenario would probably lie somewhere in between the extremes. In general, the effects would be similar, except that the timing might differ. The total employment and payroll would likely be the same as any transfers would likely be "surplus" workers who might otherwise be laid off from their current projects. Under the circumstances, this analysis assumed all of the permanent workers would be new hires to determine whether there could be substantial gaps in local facility and service capabilities should the maximum scenario occur.

Income and Employment

The Proposed Action would continue to employ the existing 450 workers, all of whom are committed to the proposed NOA. Approximately 410 of the 450 are BMM employees and 40 are contractors.

Construction

Construction would require work force increases of up to 2 years, including approximately 64 BMM staff and 80 contractors for the proposed NOA, plus up to 120 additional contractors for the proposed SOA. Considering the relatively short time period of construction employment spikes and that three-quarters of the increases would be contract workers, many of whom would likely be currently located in the three-county study area, it is likely that the indirect and induced employment generated by the construction activity would be 24 indirect and 36 induced jobs. Considering the relatively small number of workers needed, the short duration of high-activity construction periods, and the over 2,300 unemployed workers in the study area, local labor is expected to provide 55 percent of the direct project workers and all of the indirect and induced workers during construction, leaving a need for very few workers from outside the local area. The 55 percent figure is equivalent to current local versus non-local employment at the mine. The assumption that indirect and induced employment from construction activities would all be local derives from the short-term (2 years or less) construction employment spikes, which are considered to be too brief to attract significant numbers of non-local job seekers for most secondary job opportunities. The employment impact during construction represents less than 0.3 percent of total employment in the three-county study area. It would lower the unemployment rate in the study area from 6.3 percent to 5.9 percent.

Operations and Total

Total employment at the proposed NOA would ramp up from the current level to 594 workers (including contractors) in 2016 and would peak at 782 in 2018, with the addition of construction and operations personnel at the proposed SOA. At peak, the total would include 332 additional workers over current levels, including 100 additional contractors. After the end of a construction spike at the proposed SOA in 2018, total employment would drop by over 100 and continue at approximately that level, with some variability, through 2024 (**Tables 3.17-8**). The annual average employment from 2016 through 2024 would include 566 BMM staff and 98 contractors. Relative to current direct employment, this would be equivalent to 156 additional BMM employees and 58 additional contractors for a total of 214 additional workers (**Tables 3.17-8**). For purposes of this analysis, it is assumed that all of these individuals would be new workers.

Table 3.17-9 illustrates the indirect and induced employment that would result from the average increase in direct employment from 2016 through 2024. As previously noted, it is uncertain how many of the project employees would be new hires – which would theoretically generate indirect and induced jobs based on a multiplier effect – as opposed to transferees from other local projects. If some or all of the jobs were filled by transferees, the indirect and induced employment they would support would already be embedded in the local economy and the effect would be one of sustaining existing economic activity rather than generating new activity. The peak employment effects noted in **Table 3.17-10** also are considered to be maximums because direct project employment above approximately 660 workers would last for just 4 years (2017, 2018, 2019, and 2022). It is likely that indirect and induced employment changes may be somewhat lower than indicated in the table as these secondary and tertiary effects would not respond as quickly as direct employment, although much of the economic activity generated by worker expenditures would still occur.

Because there are approximately 2,350 unemployed workers within the three-county study area, it is assumed that many of the workers needed for the proposed NOA and SOA projects would be available locally. The calculations in **Tables 3.17-9** and **3.17-10** assume local workers would fill approximately 55 percent of direct project jobs and 75 percent of the indirect jobs during development and operation of the proposed NOA and SOA projects. An estimated 149 direct and 62 indirect and induced workers from outside the local area would be needed in the peak year (2018). The total of 581 additional jobs in the 2018 peak year would represent a 1.7 percent increase over total 2012 employment in the three-county study area. It would reduce the unemployment rate from the 2012 level of 6.3 percent to approximately 4.7 percent for a 1- to 2-year period, if all of the jobs were filled by new hires from the local area. If the stated assumptions about local versus non-local hires were accurate, the unemployment rate would be reduced to 5.3 percent as a result of the 369 local hires.

In comparison, the average new total project-generated employment over the 9-year period from 2016 through 2024 would be 375 new direct, indirect and induced jobs, an estimated 238 of which would be filled by local workers. At this level, the existing unemployment level in the three-county area would be reduced from 6.3 percent to 5.6 percent.

The employment effects would be proportionally less than those described during later years of the proposed NOA and SOA projects. As **Table 3.17-8** illustrates, employment would revert to approximately current levels in 2025 and 2026, and would drop below current levels from 2027 through the end of the project.

The estimated average annual wage, including benefits, for salaried and hourly workers would be approximately $111,000. Consequently, the direct payroll would range over the life of the mine from $52.6 million (2016) to $71.2 million (at peak year of 2018), declining to $53.9 million in 2024), and then declining further with the reduction in work force after 2024. If it is assumed that contractors would earn approximately the same as BMM employees, they would add $13.3 million in 2016, $15.5 million in 2018, and $14.4 million in 2024, resulting in a total of $65.9 million in 2016, $86.8 million in 2018, and $68.3 million in 2024. Each $1.00 in direct earnings would indirectly generate $0.37 in earnings to other workers in the local economy (BEA 1992; Dobra 1989; Price and Harris 2007). Consequently, the annual indirect earnings effect would be $24.3 million in 2016, $ 32.1 million in 2018, and $25.3 million in 2024. The increase in income earnings would be a substantial economic benefit accruing to the local economy of the three-county study area.

Table 3.17-9 Proposed Action New Project-related Employment, Households, and Population Projections (2015-2024 Average)

New Project-related Employment								
Direct[1]			Indirect and Induced[2]			Total		
Local	Non-local	Total	Local	Non-local	Total	Local	Non-local	Total
118	96	214	120	40	161	238	136	375

New Project-related Households			
	Direct[3]	Indirect & Induced[4]	Total New Households
New Non-local Workers	96	40	
Single	24	10	34
Married - 1 Worker	65	15	80
Married - 2 Workers	4	8	12
New Households	**93**	**33**	**126**

New Project-related Population					
		Population[5]			
			Children[6]		
	Households	Adults	School-Age	Other	Total
Single Households	34	34	0	0	34
Married Households	92	184	52	13	247
Total	**126**	**218**	**52**	**13**	**283**

1 Work force was assumed to be 55 percent local, 45 percent non-local.

2 Indirect employment was calculated using an employment multiplier of 0.30; induced employment was calculated using a multiplier of 0.45 (Dobra 1989); the indirect and induced work force was assumed to be 75 percent local and 25 percent non-local.

3 Non-local direct work force was assumed to be 25 percent single or married without families present; 10 percent of married worker households were assume to be two-worker families.

4 Non-local indirect and induced work force was assumed to be 25 percent single or married without families present; half of married worker households were assume to be two-worker families.

5 Population estimates were based on one person per single family household and 2.71 persons per married household.

6 Eighty percent of children were assumed to be of school age.

Table 3.17-10 Proposed Action – New Project-related Employment, Households, and Population Projections (2015-2024 Peak)

New Project-related Employment								
Direct[1]			**Indirect and Induced[2]**			**Total**		
Local	**Non-local**	**Total**	**Local**	**Non-local**	**Total**	**Local**	**Non-local**	**Total**
183	149	332	187	62	249	369	212	581

New Project-related Households			
	Direct[3]	**Indirect & Induced[4]**	**Total New Households**
New Non-local Workers	149	62	
Single	37	16	53
Married - 1 Worker	101	23	124
Married - 2 Worker	6	12	17
New Households	**144**	**50**	**194**

New Project-related Population					
		Population[5]			
			Children[6]		
	Households	**Adults**	**School-Age**	**Other**	**Total**
Single Households	53	53	0	0	53
Married Households	141	282	80	20	382
Total	**194**	**335**	**80**	**20**	**435**

1 Work force was assumed to be 55 percent local, 45 percent non-local.

2 Indirect employment was calculated using an employment multiplier of 0.30; induced employment was calculated using a multiplier of 0.45 (Dobra 1989); the indirect and induced work force was assumed to be 75 percent local and 25 percent non-local.

3 Non-local direct work force was assumed to be 25 percent single or married without families present; 10 percent of married worker households were assume to be two-worker families.

4 Non-local indirect and induced work force was assumed to be 25 percent single or married without families present; half of married worker households were assume to be two-worker families.

5 Population estimates were based on one person per single family household and 2.71 persons per married household.

6 Eighty percent of children were assumed to be of school age.

Hunting Related Economics

Because it is not possible to accurately quantify changes in the local deer herd population from the proposed Project, the resulting specific economic effects are similarly difficult to accurately quantify. However, employing the general deer hunting-related economic assumptions from recent years, noted above, an estimate of a range of socioeconomic impacts can be made based on potential incremental population fluctuations in deer populations. For example, if it is assumed that the Proposed Action would adversely affect the deer herd to the extent that Management Area 10 hunt tags would be reduced by 10 percent, and using the deer tag data and economic contribution calculations provided in Section 3.17.1.3, Economy and Employment, the effect on hunting expenditures would be a reduction of approximately $2.5 million, or 2.7 percent of 2011 statewide big game hunting expenditures. State and local tax revenues would be reduced by approximately $203,000 statewide. For each additional 10 percent increment in tag reduction, hunting-related expenditures and tax revenues would decline proportionally. For additional information on the potential effects of the Proposed Action on the deer herd, see Section 3.7, Wildlife and Fisheries Resources.

Population

Potential average and peak population increases resulting from development of the Proposed Action are presented in **Tables 3.17-9** and **3.17-10**, respectively. The figures include population effects from anticipated indirect and induced employment.

As noted above, it is uncertain how many of the workers needed for the proposed NOA and SOA projects would be new hires and how many would be transferred from other projects. It also is notable that the highest levels of employment for the Proposed Action would only last for approximately 1 to 2 years at a time. Consequently, the actual population effects may well be less than the calculated estimates shown, especially for the peak employment. The estimated number of employees noted in the average (**Table 3.17-9**) addresses a 9-year period during which total employment would be at or above 600, or approximately 150 above current levels. An expectation of a 9-year-long job would be more likely to entice a family to move than a 1- or 2-year job. At the average employment level, the population increase is estimated at approximately 283, which would be approximately 0.5 percent of the 2010 population of the three counties. Should the peak new employment generate the population estimated in **Table 3.17-10**, the total new population would be approximately 435 people, or 0.7 percent of the 2010 population of the study area. In either case, the population effect of the Proposed Action would be expected to be modest.

Slightly over 88 percent of employees at the existing NOA operations reside in the three-county study area: 70 percent in Elko County, 13 percent in White Pine County, and 5 percent in Eureka County. It is likely that new workers would follow a similar pattern. Elko County, and the City of Elko in particular, is a major draw because of the concentration of both public and private sector resources and facilities. Eureka, being much smaller, has more limited resources and is constrained by a limited housing supply (see below). According to this pattern, if the peak population potential should occur, approximately 305 additional people would locate in Elko County, which would add only 0.6 percent to the county population; 56 people (0.6 percent of the current population) would locate in White Pine County; and 22 people (1.1 percent of the county population) would locate in Eureka County. Population increases at these levels would not impose significant burdens on any of the three counties, although housing may be the most important limitation.

Housing

Construction

A maximum of 200 contract construction workers is expected to be needed for the Proposed Project. Assuming most construction workers would be hired from the local labor force, they would not affect the housing market to any substantial degree. If substantial numbers of the anticipated contractor work force were brought in from outside the area; however, there is an ample supply of temporary housing resources available to accommodate them with well over 2,000 motel/hotel rooms, over 500 RV spaces, and several campgrounds in the local area to accommodate them with minimal effects on other local activities. While there could be some competition for temporary housing during high tourism seasons, less than 8 percent of the total temporary housing supply would be needed for project construction workers even if the highly unlikely case should occur that all the contract construction workers were to be non-locals in need of temporary accommodations.

Operations

Operations would generate demand for an estimated maximum of 194 housing units for the peak 2 to 3 years of the project (**Table 3.17-10**) or an average of 126 units over the first 9 years of the proposed NOA and SOA projects. At the time of the 2010 census, there were over 3,000 vacant housing units in the study area (**Table 3.17-4**), which if it has continued to be reasonably accurate, would indicate there would be more than enough housing available to accommodate both the peak and the average demand. The vacancies aren't uniform across the housing stock, however. The owner-occupied housing market was very tight with vacancy rates throughout the study area at or below 3.3 percent. In contrast, there were moderate to high vacancy rates in the rental housing stock, which should be sufficient to accommodate the expected project-related demand. It is likely; however, that the availability of suitable housing in Eureka County is constrained by the small size of the market and a growing demand from other activities. Assuming this is the case, more of the new project-related households would be likely to locate in Elko County communities, or the Ely vicinity. Approximately 70 percent of the current work force resides in Elko County, 13 percent in White Pine County, and 5 percent in Eureka County. If this pattern were to hold true for the new operations workers, the peak project-related demand would be 136 units in Elko County, 25 units in White Pine County, and 10 units in Eureka County. In contrast, Eureka County has added 50 new rental units and has a new subdivision with plans for up to 122 single family units and 110 multi-family units.

Community Facilities and Services

No significant capacity or service issues have been identified for public facilities or services in the three-county study area. In addition, underlying population growth rates have declined to modest levels in recent years. Consequently, the relatively small number of new people that would be anticipated for construction and operation of the proposed NOA and SOA projects, even under the maximum scenario, would not be expected to adversely affect public services in the area.

Education

School enrollment would increase by between 52 and 80 students under the estimated average and peak population growth scenarios for operations at the proposed NOA and SOA projects. Assuming a population distribution similar to that of current employees at the existing NOA, up to 56 new students would enroll in Elko County schools, 10 new students would enroll in White Pine County schools, and just 3 new students would enroll in Eureka County schools. At these levels of increase, the effects would be minor and should not adversely affect district schools.

Public Finance

The proposed NOA and SOA projects would generate public revenues from sales and use taxes, net proceeds of mines taxes, *ad valorem* property taxes, and from business taxes. The estimates presented in this analysis are based on information provided by Barrick at a point in time prior to project development. As such, they are subject to change as the project proceeds and commodity prices fluctuate. The estimates are believed to be a reasonable assessment of the tax revenues that would flow from the project.

Construction, operation, maintenance, and abandonment of the proposed mine would generate increases in sales and use tax receipts. Purchases of equipment, supplies and construction materials for the Proposed Action would be subject to sales tax as would consumer purchases by the construction work force. Detailed estimates of the taxable purchases made in the affected area by the mine and construction work force cannot be quantified at this time, however, Barrick estimates project-generated sales taxes would be generally in the range of from $5 million to $6 million per year for the life of the project until production ends. Sales taxes would be collected in the jurisdiction where purchases were made and would be distributed among the state, the school district(s), the county, and the counties' revenue sharing pool. School districts – including White Pine County, Eureka County and possibly Elko County – are significant beneficiaries of sales and use taxes, receiving approximately 38 percent of the proceeds. The local county's share of sales taxes is relatively modest at approximately 7 percent of the revenue.

In the event deer hunting is adversely affected by the Proposed Action, the reduction in related expenditures would also result in a reduction in sales tax and lodging tax revenues to the state and local jurisdictions. As noted above, a 10 percent reduction in Management Area 10 deer tags could be expected to reduce state and local tax revenues statewide up to approximately $203,000; a 25 percent reduction in Management Area 10 deer tags could be expected to reduce tax revenues statewide up to approximately $508,000.

Net proceeds taxes and *ad valorem* property taxes would be a more substantial contributor to county coffers and White Pine County would be the primary beneficiary of these revenues. Net proceeds of mines are categorized and taxed similar to real property. Barrick estimates property taxes from the BMM Project would be in the range of $3 million to $3.5 million for the productive life of the mine based on anticipated capital investments in plant and equipment.

Barrick estimates net proceeds taxes from the proposed NOA and SOA projects at over $141 million over the life of the mine. In general terms, net proceeds taxes are assessed on the value of production, which would vary with market prices, minus the costs of production, recovery and processing of the ore. Consequently, the annual payments can vary widely. Estimates for the proposed NOA and SOA projects range from zero in a few years to over $25 million near the end of production, after the major expense of mining has ended. For most years, net proceeds taxes are estimated to fall in a range from $5 million to $10 million. As noted in **Table 3.17-6**, the combination of property taxes and net proceeds taxes from the proposed NOA and SOA projects would have a major positive impact on White Pine County taxing entities' revenues.

In short, construction of the mine would have a major, positive, short-term fiscal effect on the entities within the affected area, and operation and maintenance of the mine would have a long-term, major, positive fiscal effect. These effects would cease at the time the proposed NOA and SOA mines were closed and abandoned.

Social Conditions

With only a modest change in permanent employment and a minor increase, at most, in population expected from the proposed NOA and SOA projects, the Proposed Action is not expected to cause adverse changes in the social structure or traditional lifestyles of study area communities. A possible influx of a small number of contract workers from outside the study area, if it should occur, would be of short duration and would have a relatively low temporary effect on the quality of life of people currently living in the area. The possible transfer of some workers to the proposed NOA and SOA projects from other Barrick projects in the region would potentially sustain the jobs of current employees for a few additional years, which would be expected to sustain their individual lifestyles, and modestly enhance the stability and social structure of the community as a whole. Extending the employment of those workers could be beneficial to the long-term sustainability of the community as it would provide additional time for local economic diversification efforts to be realized.

3.17.2.2 North and South Operations Area Facilities Reconfiguration Alternative

Under the Reconfiguration Alternative, social and economic effects would be generally similar to the Proposed Action, but reduced in magnitude because the mine life would be just half as long and the short-term peak total work force would be approximately one-third lower than for the Proposed Action.

Income and Employment

The Reconfiguration Alternative would continue to employ most of the existing 450 workers with the majority being BMM workers. **Table 3.17-11** summarizes the estimated employment by year for the Reconfiguration Alternative. For the North Operations Area Project, construction activities would initiate in year 2015 pending permit approvals with an initial work force of approximately 430 workers that increases in 2017 to a peak of 511 workers with the expansion of the contract work force and initiation of operations. Employment would decline to 191 workers in 2019 during operations after initial construction activities were completed, would fall below 100 workers from 2021 to 2024, and be reduced to 41 workers by 2025 at the end of operations in the NOA (**Table 3.17-11**).

For the South Operations Area, construction would begin in 2017 and operations in 2018. The number of workers would increase from 120 at startup to a peak of 289 in 2020 through 2022. Employment would decline to approximately 193 workers in 2023 and be reduced to 25 workers by 2025 at the end of operations in the SOA (**Table 3.17-11**).

The total combined employment for the Reconfiguration Alternative would be approximately 430 in 2016 and it would increase to a peak of 582 in 2018 followed by a reduction to 366 in 2020 through 2023 before a further reduction to 66 workers in 2025 at the end of operations. Under this alternative, the average number of workers over the 10-year life of the project would be approximately half the average number of workers for the Proposed Action during the same 10-year timeframe.

Construction

Construction would require contractor work force increases of up to 2 years, including approximately 120 contractors for the NOA in 2016 and 2017, plus up to 120 additional contractors for the SOA in 2017 under this alternative (**Table 3.17-11**). There would be a slight reduction in the existing BMM work force during this timeframe but overall there would be a net increase due to the growth in contract workers. The construction work force impacts under this alternative would be similar to those described for the Proposed Action as there would be a similar number of contract workers under both alternatives during the initial construction phase and considering the relatively short time period of construction employment spikes. Under this alternative, the indirect and induced employment generated by the construction activity would be expected to be similar to the Proposed Action with an estimated 24 indirect and 36 induced jobs. Similarly, local labor is expected to provide 55 percent of the direct project workers and all of the indirect and induced workers during construction, leaving a need for very few workers from outside the local area. The employment impact during construction represents less than 0.3 percent of total employment in the three-county study area.

Operations and Total

Total employment at the NOA would ramp up from the current level to 511 workers (including contractors) in 2017 and would peak at 582 in 2018 with the addition of construction and operations personnel at the SOA (**Table 3.17-11**). At the peak, total employment would include 132 additional workers over current levels, including contractors. After the end of a construction spike at the NOA and SOA in 2018, total employment would decline by approximately 200 workers by 2019 and level off at approximately 366 workers through 2023, drop to 287 employees in 2024, before declining to 66 workers in 2025 when operations end (**Table 3.17-11**). The annual average employment from 2015 through 2024 would include 321 BMM staff and 54 contractors.

Table 3.17-11 Employment Estimates for the North and South Operations Area Facilities Reconfiguration Alternative

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
North Operations Area										
Salaried	67	68	67	47	47	47	47	47	39	13
Hourly	353	323	275	134	84	20	20	20	50	23
Subtotal	420	391	342	181	131	67	67	67	89	36
Contractors	10	120	120	10	10	10	10	10	5	5
NOA Subtotal w/Contractors	430	511	462	191	141	77	77	77	94	41
South Operations Area										
Salaried	0	0	0	20	20	20	20	20	20	
Hourly	0	0	0	134	195	259	259	259	168	20
Subtotal	0	0	0	154	215	279	279	279	188	20
Contractors	0	0	120	60	10	10	10	10	5	5
SOA Subtotal w/ Contractors	0	0	120	214	225	289	289	289	193	25
North Operations Area and South Operations Area Projects Combined										
Salaried	67	68	67	67	67	67	67	67	59	13
Hourly	353	323	275	268	279	279	279	279	218	43
Subtotal	420	391	342	335	346	346	346	346	277	56
Contractors	10	120	240	70	20	20	20	20	10	10
NOA and SOA Subtotal w/ Contractors	430	511	582	405	366	366	366	366	287	66

The estimated average annual wage, including benefits, for salaried and hourly workers would be approximately $111,000. The direct payroll would range from $46.6 million (2016) to $37.9 million (at peak year 2018), declining to $30.7 million in year 2024), and further declining with the reduction in work force at the end of operations. If it is assumed that contractors would earn approximately the same as BMM employees, they would add $1.1 million to the BMM payroll in 2016, $26.6 million at peak year (2018) and $1.1 million in 2024, for a total payroll of $47.7 million in 2016, $64.6 million in 2018 and $31.8 million in 2024. The direct payroll is estimated to be approximately $38 million per year during the 2019 to 2022 operations timeframe with contractors contributing $3.6 million per year.

Each $1.00 in direct earnings would indirectly generate $0.37 in earnings to other workers in the local economy (BEA 1992; Dobra 1989; Price and Harris 2007). Consequently, the annual indirect earnings effect would range from $17.6 million (2016) to $11.7 million (2024); during the peak year (2018), the annual indirect earnings effect would be $23.9 million. Typical annual indirect earnings effect during the operations phase would be approximately $15.3 million. The increase in income earnings would be a substantial economic benefit accruing to the local economy of the three-county study area.

Hunting Related Economics

A key objective of the Reconfiguration Alternative was to reduce impacts to the Management Area 10 mule deer herd by maintaining three designated undisturbed migration corridors through the NOA. It is anticipated that this alternative would reduce impacts to the Management Area 10 mule deer herd and correspondingly would be expected to have reduced economic effects as a result of potential reductions in Management Area 10 hunt tags allocated annually by NDOW. Because it is not possible to accurately quantify the effect of the Reconfiguration Alternative on the local mule deer herd population, the economic effects are similarly difficult to quantify. Employing the general deer hunting-related economic assumptions from recent years, noted above, and projecting forward, if it is assumed that the Reconfiguration Alternative would adversely affect the deer herd to the extent that Management Area 10 hunt tags would be reduced by 5 percent, the effect on hunting expenditures would be a reduction of up to approximately $1.25 million or 1.35 percent of the 2011 statewide big game hunting expenditures. State and local tax revenues would be reduced by up to approximately $101,500 statewide. For each additional 5 percent increment in tag reduction, hunting-related expenditures and tax revenues would decline proportionally. For additional information on the potential effects of the Reconfiguration Alternative on the deer herd, see Section 3.7, Wildlife and Fisheries Resources.

Population

Population effects from the Reconfiguration Alternative would be less than the impacts described for the Proposed Action as fewer workers would be hired under this alternative. The highest levels of employment would only last for approximately 1 to 2 years in 2016 and 2017 during startup of construction and operations. Total employment would average 375 BMM employees and contractors during the 2015-2024 timeframe, or approximately 75 below current staffing levels of 450. Under the Reconfiguration Alternative, the average employment level is slightly reduced from current employment levels at the mine, and this would have minimal effects on the population of the three counties.

Housing

Construction

Similar to the Proposed Action, a maximum of 200 contract construction workers are expected to be needed under the Reconfiguration Alternative. Assuming most construction workers would be hired from the local labor force, they would not affect the housing market to any substantial degree.

Operations

Operations would not generate any additional demand for housing units because the current work force employed at the mine would fill the demand under the Reconfiguration Alternative.

Community Services and Facilities

The 1- to 2-year increase in a small number of contract workers that would likely reside in the three-county area would not negatively impact public services in the area. No significant capacity or service issues have been identified for public facilities or services in the three-county study area.

Education

School enrollment would not materially change from existing conditions based on the projected employment at the mine for operations under the Reconfiguration Alternative.

Public Finance

The Reconfiguration Alternative would generate public revenues from sales and use taxes, net proceeds of mines taxes, *ad valorem* property taxes, and from business taxes.

Under this alternative, sales and use tax receipts would be generated over the life of mine. Purchases of equipment, supplies and construction materials would be subject to sales tax as would consumer purchases by the construction work force. Barrick estimates project-generated sales taxes would be approximately $5 million per year for the life of the Reconfiguration Alternative until production ends.

It is anticipated that the Reconfiguration Alternative would result in reduced impacts to the Management Area 10 mule deer population and the associated hunting opportunity within the study area. For this alternative there would be less impact in related expenditures that would also result in smaller reductions in sales tax and lodging tax revenues to the state and local jurisdictions in comparison to the Proposed Action. As noted above, a 5 percent reduction in Management Area 10 deer tags would be expected to reduce state and local tax revenues statewide by approximately $101,500.

Barrick estimates net proceeds taxes from the Reconfiguration Alternative at approximately $53 million over the life of the mine that would average about $5 million per year. Barrick estimates that net proceeds taxes would range from $3.2 million to $7.5 million on an annual basis and would peak in 2018 over the life of this alternative, and that property taxes from this alternative would average over $2 million per year for the productive life of the mine based on anticipated capital investments in plant and equipment.

Construction of the mine would have a substantial, positive, short-term fiscal effect on the entities within the affected area, and operation and maintenance of the mine would have a long-term, major, positive fiscal effect. These effects would be shorter in duration under this alternative than the Proposed Action due to the shorter mine life (10 years) compared with 20 years for the Proposed Action. These effects would cease at the time the mines were closed and abandoned.

Social Conditions

With little change in permanent employment and no increase in population expected, the Reconfiguration Alternative is not anticipated to cause adverse changes in the social structure or traditional lifestyles of study area communities.

3.17.2.3 North and South Operations Area Western Redbird Modification Alternative

The WRM Alternative would be the same as the Reconfiguration Alternative, except for a reduction to the Redbird Pit and RDA footprints and changes to haul roads, reclamation, and snow routes to benefit mule deer.

Effects of the WRM Alternative on employment and income would be similar to those described for the Reconfiguration Alternative, except that for the NOA, there would be a reduction in the maximum number of employees from 511 to 498 (in 2017); minimum employment in the NOA (41 in year 2025) would be the same as under the Reconfiguration Alternative. Employment in the SOA would be the same as the Reconfiguration Alternative.

Impacts to hunting economics would be similar to, but potentially reduced from, the Reconfiguration Alternative because the WRM Alternative represents a reduction in acres impacted and the duration of mining activities on the west side of the NOA, and includes changes to haul roads, reclamation and snow routes to further reduce impacts to the Management Area 10 mule deer herd.

Impacts to housing, community services and facilities, education, public finance, social conditions would be similar to the Reconfiguration Alternative.

3.17.2.4 No Action Alternative

Under the No Action Alternative, the proposed NOA and SOA projects would not be developed and associated impacts to social and economic values would not occur. Barrick would continue its operations, closure, and reclamation activities within the NOA and SOA boundaries under the terms and current permits and approvals as authorized by the BLM and State of Nevada. Under the No Action Alternative, construction of all previously authorized expansion and associated facilities would be implemented and reclaimed as authorized. The number of employees would continue at the current level of 410, and there would be 40 full-time contractors. Assuming an average wage of $111, 000, the direct payroll for 410 employees would be $45.5 million. With consideration of 40 contractors, total payroll would be $49.9 million. Barrick estimates project-generated sales taxes would be approximately $100,000-$145,000 per year until production ends. Net proceeds tax payments would range from zero to about $24 million through 2021; in all but three years, net proceeds taxes are estimated to be zero. Property tax would generally be about $1 to $3 million per year through 2021 (Barrick 2015d).

After the end of mining in 2022, employment would taper down to approximately 3 workers for final monitoring. After the end of production, net proceeds tax payments would end and property taxes would decline substantially. Sales tax revenues received by the three counties would be substantially reduced. Demand by mine employees and their families for housing, schools, fire and police protection, and utilities may be reduced if alternative jobs are not available locally when the mine closes, forcing workers to move elsewhere for employment. However, if the current expansion in mining activity in the study area continues until the mine closes, the impact on county employment, income, and infrastructure would be less than would occur under less favorable economic conditions. Many of the current BMM employees would be likely to find work at other mines in the analysis area under that circumstance. Considering the combined labor force in the three counties (37,541) and the current 6.3 percent unemployment rate (2,353 unemployed individuals), if all 410 employees and all 40 contractors were local and could not find work elsewhere, the unemployment rate would increase to 7.5 percent. This rate would be lower than the 11.6 percent statewide unemployment rate and the 8.1 percent national rate identified in Section 3.17.1.3.

3.17.2.5 Cumulative Impacts

The study area and CESA for social and economic values includes Elko, Eureka, and White Pine counties; with particular focus on the communities of Elko, Carlin, Spring Creek, Eureka, and Ely, Nevada (**Figure 3.17-1**). Past and present actions and RFFAs are discussed in Section 2.7, Past, Present, and Reasonably Foreseeable Future Actions; their locations are illustrated in **Figure 2.7-1**.

<u>Proposed Action</u>

Employment from mining activity in and near the three-county study area is a major contributor to economic activity in the social and economic values CESA. In comparison, employment and expenditures for other RFFAs would be relatively minor. Consequently, the focus of this discussion is on the three mining projects listed in **Table 2.7-4** and the estimated employment figures included therein. Construction employment for the mines would typically be short-term in nature, lasting 1 to 2 years, at most. Consequently, potential cumulative effects of these construction activities with the Proposed Action would depend on timing. If timing of construction would not coincide with the Proposed Action, the cumulative effects would be minimal. If the schedules would coincide, the cumulative effects would be minor because the anticipated construction work forces would be in the range of 500 to 600 workers, perhaps half of whom would come from the estimated 2,300 unemployed in the social and economic values CESA and the other half from outside the area. Local workers would already be situated in the social and economic values CESA and there are ample temporary housing facilities available to accommodate 300 temporary residents without adversely affecting the communities.

The RFFA operations work forces would be somewhat larger, estimated at up to 900 workers, somewhat less than 20 percent of which would be attributable to the Proposed Action. With approximately half of these workers coming from outside the social and economic values CESA, the main concern would be housing availability. **Table 3.17-4** indicates there would be sufficient rental housing available, although increased demand for homeowner units could be problematic. The greatest stress point for housing would be in Eureka County, where the Mount Hope Molybdenum Mine Project (the largest of the RFFA mine employers) would be located. With the exception of the concern about housing availability, the remainder of the likely cumulative effects of the Proposed Action would be beneficial, generating income and employment benefits in the social and economic values CESA. As noted above, the Proposed Action could expand employment by a relatively small amount. It could extend employment for workers transferred from other Barrick mines by several years; or there could be a combination of expansion and extension of employment. Regardless of the exact scenario that would transpire, the Proposed Action would represent a relatively small portion (peak of 4 percent, average of 2.6 percent or less) of the total mining-related employment in the area.

There is some concern that the proposed Project would adversely affect Eureka County because project workers and their families may locate in the county, but tax revenues from the mine and a majority of other project generated public revenues would accrue to other counties. As noted above, it is likely that most new project workers and families would locate in the Elko County or White Pine County, although there may be a small increment that would locate in Eureka County. This would add a commensurately small increment to the demand for public facilities and services in Eureka County. However, any increase would be offset by the fact that there are existing activities and RFFAs located in Eureka County that would generate revenues to the county, but that have employees choosing to live, and using services and facilities, in Elko County or White Pine County.

In summary, no adverse social or economic effects have been identified for the Proposed Action; therefore, no adverse cumulative social or economic effects are anticipated.

North and South Operations Area Facilities Reconfiguration Alternative

Under the Reconfiguration Alternative, social and economic effects would generally be similar to, but less in magnitude as described under the Proposed Action. The construction employment for the mines work force identified in **Table 3.17-11** would be in the range of approximately 500 workers including the construction work force from the Reconfiguration Alternative. Cumulative effects of construction activities would be considered minimal to minor as discussed above.

The operations work force for RFFAs are estimated at up to 900 workers, with no additional operations work force required for the Reconfiguration Alternative as the existing mine work force will fill this need. The cumulative effects under the Reconfiguration Alternative would be beneficial, generating income and employment benefits in the social and economic values CESA similar to the Proposed Action but at a reduced level.

North and South Operations Area Western Redbird Modification Alternative

The cumulative effects under the WRM Alternative would be similar to, but slightly reduced from, those described for the Reconfiguration Alternative.

<u>No Action Alternative</u>

Under the No Action Alternative, after 2022, most of the current work force of 410 employees and 40 full-time contractors would be dismissed over a period of 2 to 3 years. The effects of this scaling down would depend on the timing in relation to other mining activities in the social and economic values CESA and nearby counties. If other projects are seeking workers at that time, the effects would be minor. If not, the closure associated with the No Action Alternative would reduce natural resources and mining employment by approximately 5.4 percent, which would increase unemployment, reduce economic activity, and reduce tax revenues for local public entities. The post-closure period of care and maintenance to support the long-term land use goals would require a very small work force. This post closure-period would include maintenance of storm water management facilities and long-term water, stability, and vegetation monitoring. Employment and payroll for maintenance and monitoring activities would be a very minor increment (less than 0.3 percent) of the total mining-related economic activity in the social and economic values CESA and an even smaller increment of the total economic activity in the social and economic values CESA. There would be a small amount of sales tax generated from purchase of material and supplies needed to support the activity. There would be no new net proceeds of mines taxes generated from the proposed NOA and SOA projects. There would be no additional project-related demands for housing, community facilities and services, or education resources. With such a low level of economic activity for post-closure activities, the proposed NOA and SOA projects-related cumulative effects would be virtually undetectable in the economy of the social and economic values CESA.

3.17.2.6 Monitoring and Mitigation Measures

No additional monitoring and mitigation measures are recommended.

3.17.2.7 Residual Impacts

For the most part, social and economic effects from the Proposed Action, Reconfiguration Alternative, and WRM Alternative would end after the project is completed. There would be public and private investment in infrastructure, homes and businesses from revenues generated by the project that would have economic life beyond the life of the project.

3.18 Environmental Justice

The study area and CESA for environmental justice includes Elko, Eureka, and White Pine counties. **Figure 3.17-1** illustrates the study area and CESA for environmental justice. The rationale for the study area and CESA is that the mine would be located in White Pine County, but near the Eureka County and Elko County lines. Approximately two-thirds of the current work force resides in the Elko-Spring Creek area and it is assumed that any new workers would follow a similar pattern because the Elko area provides a combination of proximity, housing availability, and availability of a broad range of public and private services.

3.18.1 Affected Environment

EO 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was issued February 11, 1994 (59 FR 7629). EO 12898 “is intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority communities and low-income communities access to public information on, and an opportunity for participation in, matters relating to human health and the environment.” It requires each federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including social and economic effects, of its programs, policies, and activities on minority and low-income populations.

Pursuant to EO 12898, the President’s CEQ prepared “Environmental Justice: Guidance Under the Environmental Policy Act” (1997) to assist federal agencies with their NEPA procedures “… so that environmental justice concerns are effectively identified and addressed.” This analysis was conducted with the assistance of the CEQ “guidance” document.

EO 12898 states that population groups defined as minorities include: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic/Latino origin; or Hispanic/Latino. CEQ guidelines for evaluating potential adverse environmental justice effects indicate minority populations should be identified when either: 1) a minority population exceeds 50 percent of the population of the affected area, or 2) a minority population represents a “meaningfully greater increment” of the affected area population than the population of some appropriate larger geographic unit, as a whole.

Low-income populations are those communities or sets of individuals whose median income is below the current poverty level of the general population. According to the CEQ guidance, low-income populations in an affected area should be identified using the annual statistical poverty thresholds from the Bureau of the Census’ Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, federal agencies may consider as a community either a group of individuals living in geographic proximity to one another or a set of individuals (such as migrant workers or Native Americans) where either type of group experiences common conditions of environmental exposure or effect (CEQ 1997).

3.18.1.1 Minority Population

The three counties within the study area are notably less ethnically and racially diverse than the state as a whole (**Table 3.18-1**). Eureka County, in particular, is 84 percent white, non-Hispanic, compared with 76 percent for White Pine County, 69 percent for Elko County and 54 percent for Nevada. All three counties have higher percentages of American Indian, Eskimo, or Aleut population than the state’s 0.9 percent (U.S. Census Bureau 2010b). The Te-Moak Tribe of Western Shoshone Indians has its headquarters in Elko. Elko County is home to three of the four colonies of the tribe: Elko Band, South Fork Band, and Wells Band. A portion of the Duck Valley Indian Reservation also is located in northern Elko County on the Idaho-Nevada border. White Pine County hosts two Indian reservations: 1) the Goshute Reservation, approximately 60 miles northeast of Ely, home of the Shoshone-Goship people; and 2) the Ely Shoshone Reservation comprising several land parcels headquartered in and near Ely.

The Duckwater Reservation, home of the Duckwater Shoshone Tribe, is just over the county line in Nye County, approximately 50 miles southwest of Ely. There are no reservation lands in Eureka County.

Table 3.18-1 Race and Ethnicity by County within the Study Area

Race and Ethnicity	Elko County (%)	Eureka County (%)	White Pine County (%)	State of Nevada (%)
White Not of Hispanic Origin	69	84	76	54
Black Not of Hispanic Origin	<1	<1	4	8
American Indian, Eskimo or Aleut	5	2	4	1
Asian or Pacific Islander Non-Hispanic	1	1	1	8
Other and Two or More (Mixed) Races	2	1	2	3
Hispanic Origin of Any Race	23	12	13	27

Source: U.S. Census Bureau 2010b.

In accordance with the CEQ guidance on addressing environmental justice under NEPA, minority populations should be identified when either:

- The minority population of the affected area exceeds 50 percent; or
- The minority population of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

No racial or ethnic group exceeds 50 percent of the population in any county within the study area; however, the population percentages of American Indians in all three counties within the study area could be considered “meaningfully greater” than for the state as a whole, ranging from 2 times greater for Eureka County to over 5 times greater for Elko County. Therefore, for the purpose of identifying environmental justice concerns, a minority population, as defined by the CEQ guidance, exists in the study area. However, the American Indian populations in the study area tend to be concentrated on several reservations throughout the study area, all of which are separated from the proposed NOA and SOA projects by more than 30 miles.

3.18.1.2 Low-Income Populations

Table 3.18-2 summarizes Per Capita Personal Income for the State of Nevada and the three counties within the study area. As shown, PCPI now exceeds the state average in each of the three counties within the study area (BEA 2013). A detailed discussion on income is presented in Section 3.17.1.2, Income. Based on this data, none of the counties within the study area would be considered to have low-income populations under EO 12898.

3.18.2 Environmental Consequences

This section discusses project related impacts to environmental justice resulting from the Proposed Action, Reconfiguration Alternative, WRM Alternative, and No Action Alternative. Primary issues related to environmental justice are guided by EO 12898 that initiated consideration of environmental justice in federal actions. The basic question is whether any potential adverse effects of the Proposed Action, Reconfiguration Alternative, or WRM Alternative would fall disproportionately on minority or low income members of the affected community.

Table 3.18-2 Per Capita Personal Income – Nevada and Counties

Area Name	2000	2011	Percent Change	Percent of Nevada (2000)	Percent of Nevada (2011)
Nevada State Total	$30,977	$36,964	19.3	100.0	100.0
Elko County	$25,419	$40,150	58.0	82.1	108.6
Eureka County	$23,684	$38,071	60.7	76.5	103.0
White Pine County	$25,577	$39,955	56.2	82.6	108.1

Source: BEA 2010; U.S. Census Bureau 2012.

According to the CEQ guidance, "when determining whether human health effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

(a) Whether the health effects, which may be measured in risks and rates, are significant (as employed by NEPA), or above generally accepted norms. Adverse health effects may include bodily impairment, infirmity, illness, or death; and

(b) Whether the risk or rate of hazard exposure by a minority population, low-income population, or Indian tribe to an environmental hazard is significant (as employed by NEPA) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group; and

(c) Whether health effects occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards." (CEQ 1997)

"When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

(a) Whether there is or will be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment; and

(b) Whether environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low income populations, or Indian tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group; and

(c) Whether the environmental effects occur or would occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards." (CEQ 1997)

In order to assess the potential for environmental justice impacts, the socioeconomic characteristics of the counties within the study area and communities are first analyzed for the presence of minority and/or low income populations. Second, if minority and/or low-income populations are identified based on the CEQ guidance, the Proposed Action, Reconfiguration Alternative, or WRM Alternative are evaluated for potential effects, which may be expected to disproportionately impact any such populations.

3.18.2.1 Proposed Action

The initial analysis indicates that the potential effects of the Proposed Action would not be expected to disproportionately affect any particular population. The area in the immediate vicinity of the proposed

NOA and SOA projects has no resident population. The nearest residences are a few remote ranches located several miles from the proposed NOA and SOA projects. The residents of the ranches have not been identified as minority or low-income in nature. The nearest residential area is the community of Eureka, approximately 30 air miles to the southwest (and about 60 miles via existing roads). Larger communities are all at greater distances from the proposed NOA and SOA project areas and farther by road. Concentrations of American Indian populations are all located at considerable distances from the proposed NOA and SOA projects. The nearest are the Ely Shoshone Reservation lands, which are approximately 40 miles to the southeast. Considering the distances from the proposed NOA and SOA projects to American Indian populations, the only likely effects would be air quality related and those would affect the entire population equally, without regard to ethnicity or race. The air quality analysis for the proposed NOA and SOA projects is presented in Section 3.14, Air Quality.

An additional provision of the CEQ guidance requires consideration of “impacts that may affect a cultural, historical, or protected resource of value to an Indian tribe or a minority population, even when the population is not concentrated in the vicinity.” The analyses in Section 3.12, Cultural Resources, and Section 3.13, Native American Traditional Values, determined that adverse effects to such resources would not likely occur. If impacts would occur, they would be effectively minimized or mitigated through implementation of the PA and Treatment Plan.

Regarding whether “communities have been sufficiently involved in the decision making process,” the BLM has held public scoping meetings in Ely, Elko, Eureka, and Reno, Nevada and distributed public notices about the proposed NOA and SOA projects through mailings and notices in area newspapers in addition to the formal notice in the Federal Register. There also has been an extensive effort to involve the Native American communities in the process through consultation specific to the proposed NOA and SOA projects. Section 3.13, Native American Traditional Values, outlines the ongoing Native American government-to-government consultation process for the proposed NOA and SOA projects.

Based on these considerations, no disproportionate, adverse environmental justice effects would be anticipated from development of the Proposed Action.

3.18.2.2 North and South Operations Area Facilities Reconfiguration Alternative

The Reconfiguration Alternative differs from the Proposed Action largely in adjustments to facility footprints within the proposed NOA and SOA plan boundaries. Effects beyond the boundaries, where Native American populations reside, would be essentially the same as those anticipated from the Proposed Action. Consequently, no disproportionate, adverse environmental justice effects would be anticipated from development of the Reconfiguration Alternative.

3.18.2.3 North and South Operations Area Western Redbird Modification Alternative

The WRM Alternative is the same as the Reconfiguration Alternative except for the reduction or elimination of some facilities within the proposed NOA plan boundary. The effects beyond the boundaries, where Native American populations reside, would be essentially the same as those anticipated from the Reconfiguration Alternative. No disproportionate, adverse environmental justice effects would be anticipated from development of the WRM Alternative.

3.18.2.4 No Action Alternative

Under the No Action Alternative, the proposed NOA and SOA projects would not be developed and associated impacts to environmental justice would not occur. Barrick would continue its operations, closure, and reclamation activities within the NOA and SOA boundaries under the terms and current permits and approvals as authorized by the BLM and State of Nevada. Under the No Action Alternative, construction of all previously authorized expansion and associated facilities would be implemented and reclaimed as authorized. Any potential adverse environmental justice effects were addressed in the permitting process for the existing activities and no additional environmental justice effects would be expected.

3.18.2.5 Cumulative Impacts

The study area and CESA for social and economic values includes Elko, Eureka, and White Pine counties (**Figure 3.17-1**). Past and present actions and RFFAs are discussed in Section 2.7, Past, Present, and Reasonably Foreseeable Future Actions; their locations are illustrated in **Figure 2.7-1**.

The environmental justice analysis did not identify any disproportionate effects from the Proposed Action, Reconfiguration Alternative, or WRM Alternative and an extensive effort to involve all communities in the decision-making process was documented. As previously stated, no disproportionate, adverse environmental justice effects would be anticipated from development of the Proposed Action, Reconfiguration Alternative, or WRM Alternative. Consequently, no cumulative environmental justice effects are anticipated as a result of the Proposed Action, Reconfiguration Alternative, or WRM Alternative.

3.18.2.6 Monitoring and Mitigation Measures

No additional monitoring and mitigation measures are recommended.

3.18.2.7 Residual Impacts

There would be no disproportionate adverse environmental justice effects on minority or low-income populations; therefore, no residual impacts to environmental justice are anticipated.

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3.19 Visual Resources

The study area and CESA for visual resources is defined as a 15-mile BLM VRM background distance zone (**Figure 3.19-1**).

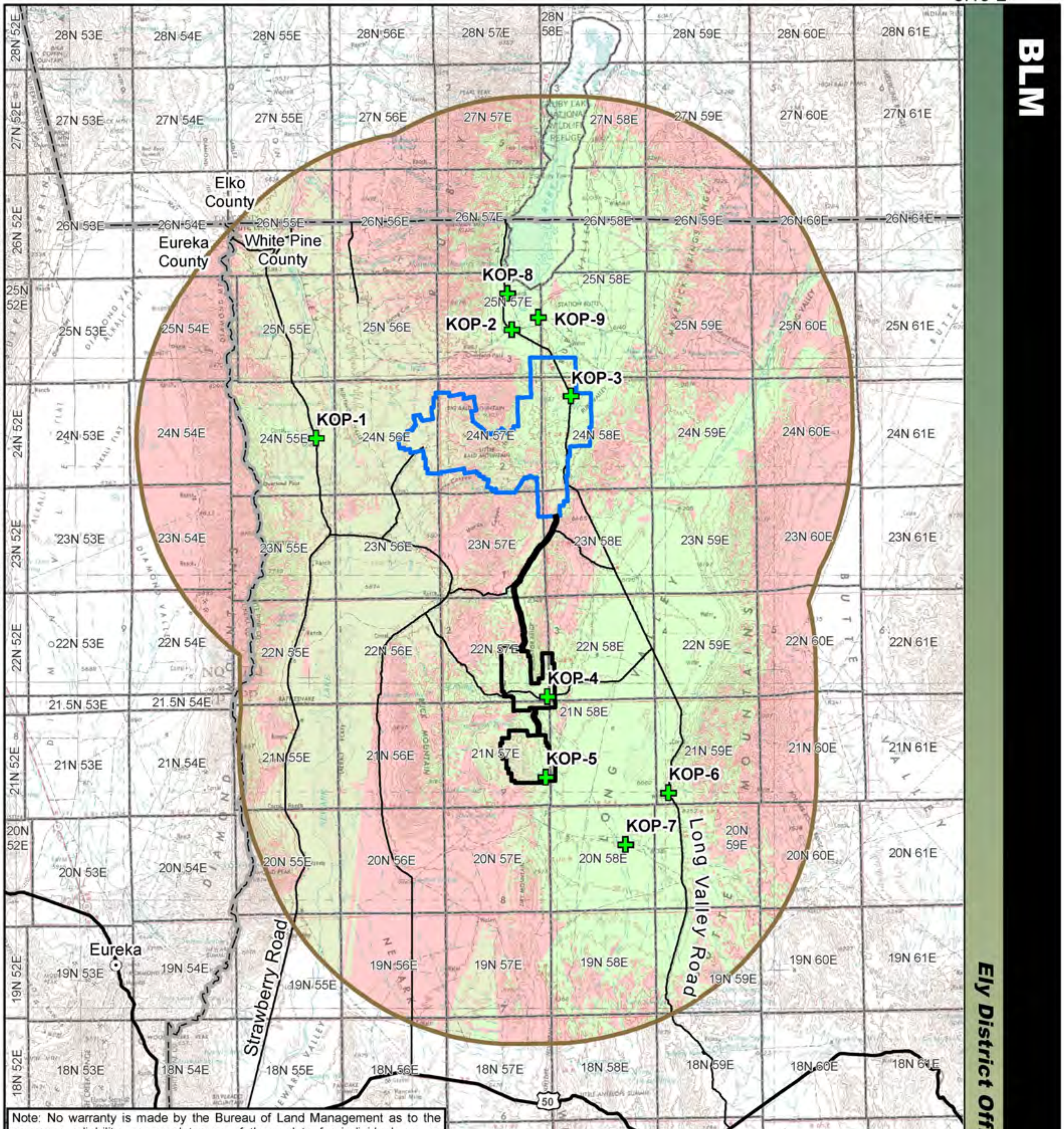
3.19.1 Affected Environment

Scenic quality is the measure of the visual appeal of a unit of land. Section 102(a) of the FLPMA (1976), states that "...the public lands are to be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." Section 103(c) identifies "scenic values" as one of the resources for which public land should be managed. Section 201(a) states that "the Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including scenic values)..." Section 505(a) requires that "each ROW shall contain terms and conditions which will...minimize damage to the scenic and esthetic values..."

Section 101(b) of the NEPA requires that measures be taken to ensure that aesthetically pleasing surroundings be retained for all Americans.

Under FLPMA, the BLM developed a standard visual assessment methodology, known as the VRM System, to inventory and manage scenic values on lands under its jurisdiction. Guidelines for applying the VRM system on BLM lands are described in BLM Manual 8400 et seq. "Public lands have a variety of visual values. These different values warrant different levels of management. Because it is neither desirable nor practical to provide the same level of management for all visual resources, it is necessary to systematically identify and evaluate these values (Illustration 1) to determine the appropriate level of management. Visual values are identified through the VRM inventory (Manual Section 8410) and are considered with other resource values in the Resource Management Planning process. Visual management objectives are established in RMP's in conformance with the land use allocations made in the plan. These area specific objectives provide the standards for planning, designing, and evaluating future management projects. The contrast rating system (Manual Section 8431) provides a systematic means to evaluate proposed projects and determine whether these projects conform with the approved VRM objectives. It also provides a means to identify mitigating measures that can be taken to minimize adverse visual impacts. The VRM system, therefore, provides a means: to identify visual values; to establish objectives through the RMP process for managing these values; and to provide timely inputs into proposed surface disturbing projects to ensure that these objectives are met. (BLM VRM System, 1986)."

The characteristic landscape of the study area is contained within a variety of landforms of the Basin and Range physiographic province (Fenneman 1931). Visual resources within the study area are influenced by topographic, vegetative, geologic, hydrologic, and land use characteristics. The topography ranges from wide, flat valley floors and low angular hills to steep mountain ranges. Vegetation is comprised of grasses, greasewood, rabbitbrush, and sagebrush at lower elevations to mountain tree and shrub vegetation, including mountain mahogany, pinion pine, and juniper at higher elevations. Vegetation patterns affect color, form, line, and contrast, which shape the basis for analysis of visual resources in the study area. Land use in the study area includes the Pony Express National Historic Trail, a NWR, historic/cultural sites, grazing and dispersed recreation, with infrequent and scattered ranches. There is surface water in the study area, including a marsh, ephemeral streams and seeps and springs. The eastern slopes of the Ruby Mountains are well-known for the springs that flow into the marsh. The excellent air quality in the region promotes expansive views. Recreational activities such as hiking, photography, wildlife viewing, and picnicking depend on the settings and scenic views that VRM is required to manage.



Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Key Observation Point
- Not Visible
- Visible
- Visual Resources Cumulative Effects Study Area

Source: BLM 2012a.

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.19-1

Visual Resources Study Area and Cumulative Effects Study Area

0 2.5 5 10 Miles

N

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A Visual Resource Inventory (VRI) was conducted to determine the visual values within the jurisdiction of the BLM Ely District Office (2011g). The components of VRI include scenic quality evaluation, sensitivity level analysis, visibility, distances zones, and visual resource inventory classes.

For the scenic quality evaluation, lands are rated as Class A (19 points or more), Class B (12 to 18 points), or Class C (11 points or less). Lands are rated using seven key factors: landforms, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modifications. **Figure 3.19-2** illustrates the scenic quality evaluation within the study area.

The sensitivity level analysis measures public concern for visual resources. Lands are assigned high, medium, or low sensitivity levels based on consideration of the following factors: types of users, amount of use, public interest, adjacent land uses, special areas, and other factors. **Figure 3.19-3** illustrates the sensitivity levels based on the sensitivity level rating units within the study area.

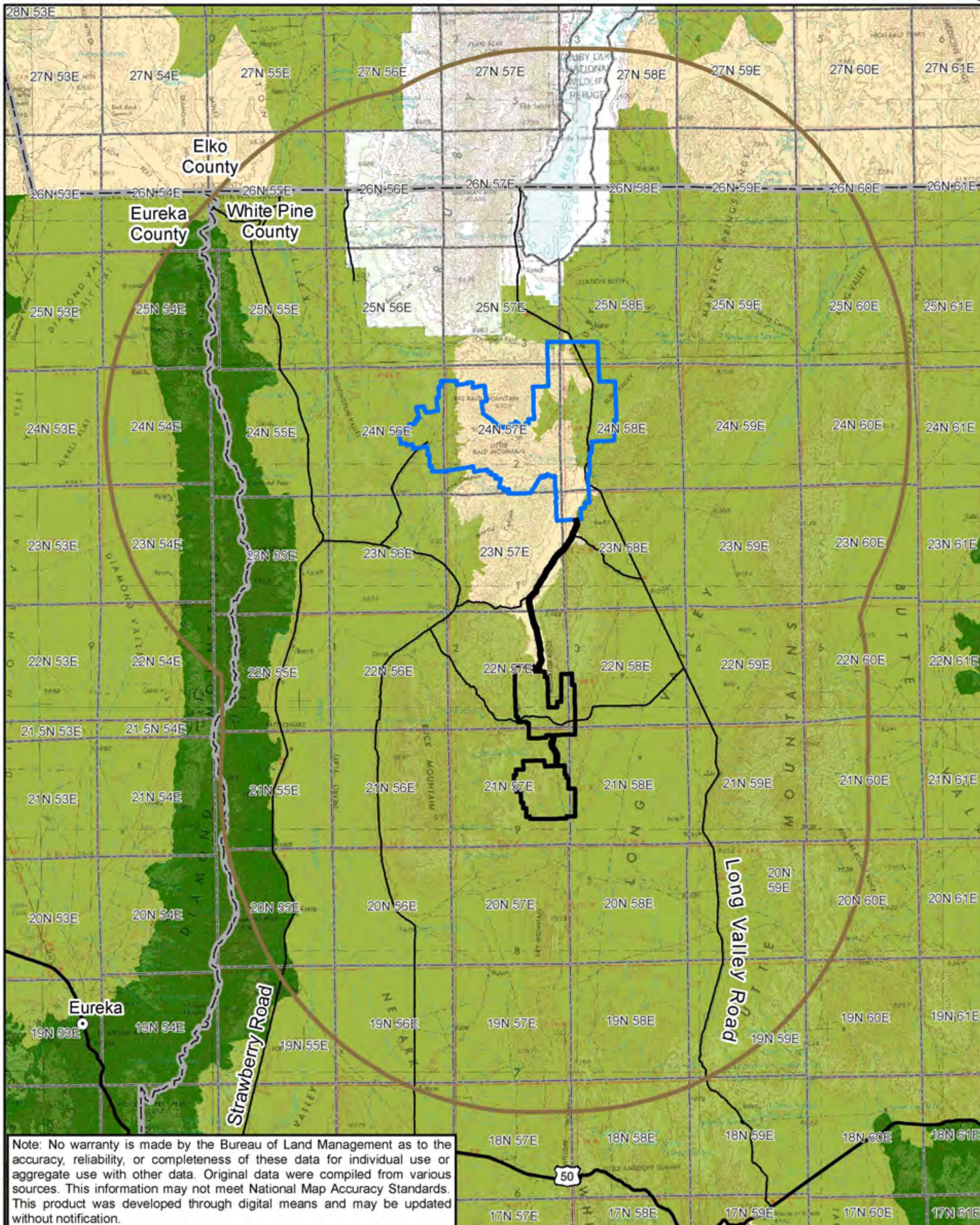
Distance zones are delineated to subdivide the landscape based on relative visibility from travel routes, use areas, or vantage points. The three distance zones (**Figure 3.19-4**) include:

- Foreground-Middleground Zone: This is an area that can be seen from a distance of 3 to 5 miles.
- Background Zone: This is the remaining area which can be seen from approximately 15 miles.
- Seldom Seen Zone: These are areas that are not visible within the foreground-middleground and background zones and areas beyond the background zones.

The scenic quality evaluation, sensitivity level analysis, and delineation of distance zones are combined to develop VRI classes (**Figure 3.19-5**), which represent the relative value of the visual resources. Classes I and II are the most valued, Class III represents a moderate value, and Class IV represents the least value. VRI classes are informational in nature and provide the baseline data for considering visual values in the RMP process. VRI classes do not establish management direction and are not used as a basis for constraining or encouraging surface-disturbing activities. **Table 3.19-1** summarizes the acreages and percent of the study area categorized into each VRI component, the resulting VRI classes, and the VRM classes.

Table 3.19-1 Visual Resource Inventory Summary

Scenic Quality Evaluation	**BLM - Class A**	**BLM - Class B**	**BLM - Class C**	**Total**	--
	91,700 acres – 9 percent	822,056 acres – 83 percent	77,522 acres – 8 percent	991,279 acres – 100 percent	--
Sensitivity Level Analysis	**High**	**Medium**	**Low**	**Total**	--
	284,299 acres – 29 percent	341,023 acres – 34 percent	365,957 acres – 37 percent	991,279 acres – 100 percent	--
Distance Zones	**Foreground-Middleground**	**Background**	**Seldom Seen**	**Total**	--
	516,516 acres – 52 percent	256,326 acres – 26 percent	218,437 acres – 22 percent	991,279 acres – 100 percent	--
VRI Classes	**VRI Class I**	**VRI Class II**	**VRI Class III**	**VRI Class IV**	**Total**
	0 acres – 0 percent	219,518 acres – 22 percent	174,291 acres – 18 percent	597,469 acres – 60 percent	991,279 acres – 100 percent
VRM Classes	**VRM Class I**	**VRM Class II**	**VRM Class III**	**VRM Class IV**	**Total**
	5 acres – 0 percent	79,652 acres – 8 percent	539,181 acres – 51 percent	429,382 acres – 41 percent	1,048,220 acres – 100 percent



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Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Visual Resources Cumulative Effects Study Area

Scenic Quality Rating Code

- A - 18.5 or More Total Score for Scenic Quality
- B - 11.5 to 18 Total Score for Scenic Quality
- C - 11 or Less Total Score for Scenic Quality

Source: BLM 2012a, 2011g.

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.19-2

Visual Resource Inventory Scenic Quality Classifications

BLM

Ely District Office

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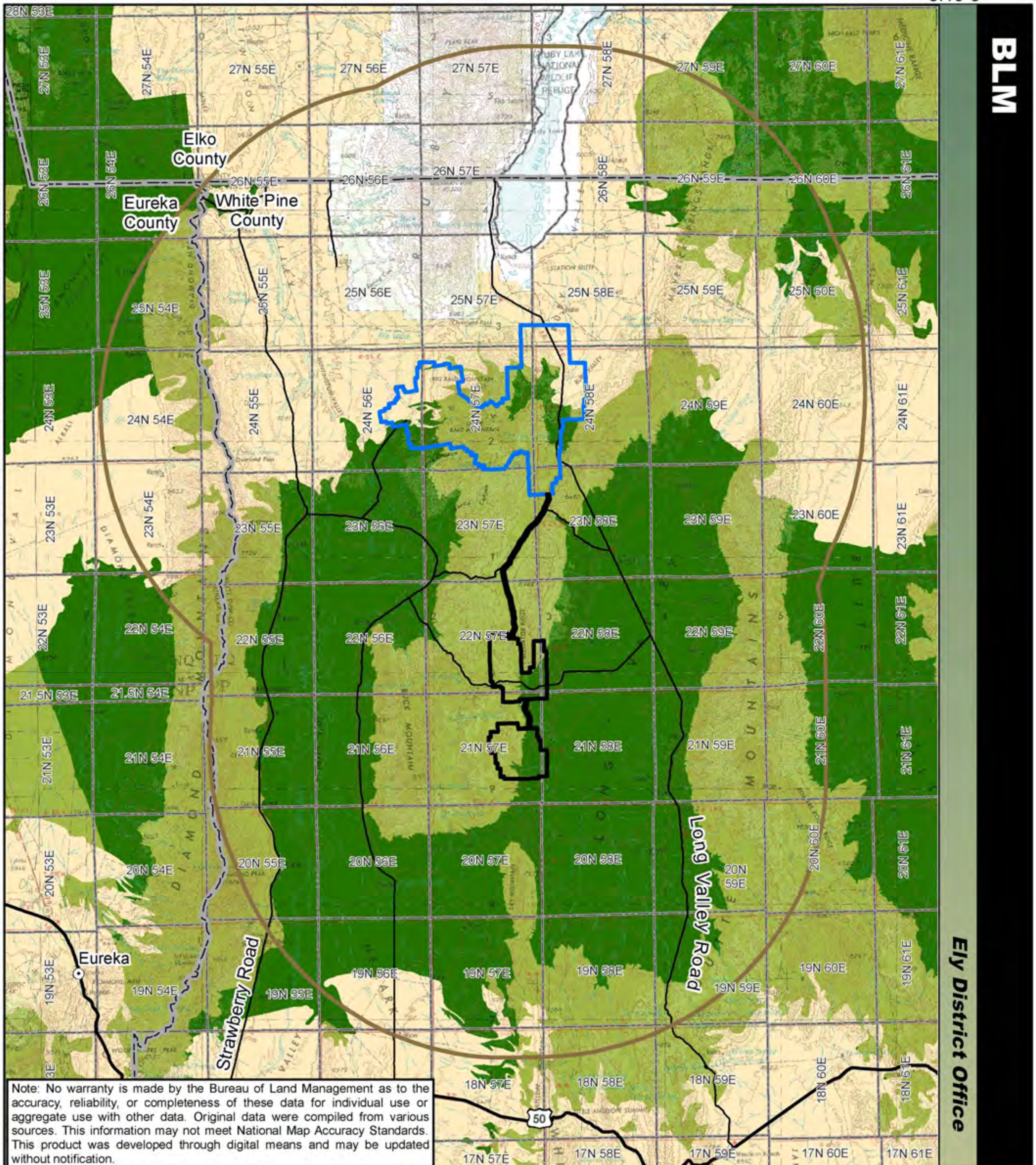

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Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Visual Resources Cumulative Effects Study Area

VRI Sensitivity Level Rating

- Maintenance of Visual Quality has Low Value
- Maintenance of Visual Quality has Moderate Value
- Maintenance of Visual Quality has High Value

Source: BLM 2012a, 2011g.

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.19-3

Visual Resource Inventory Sensitivity Level Analysis

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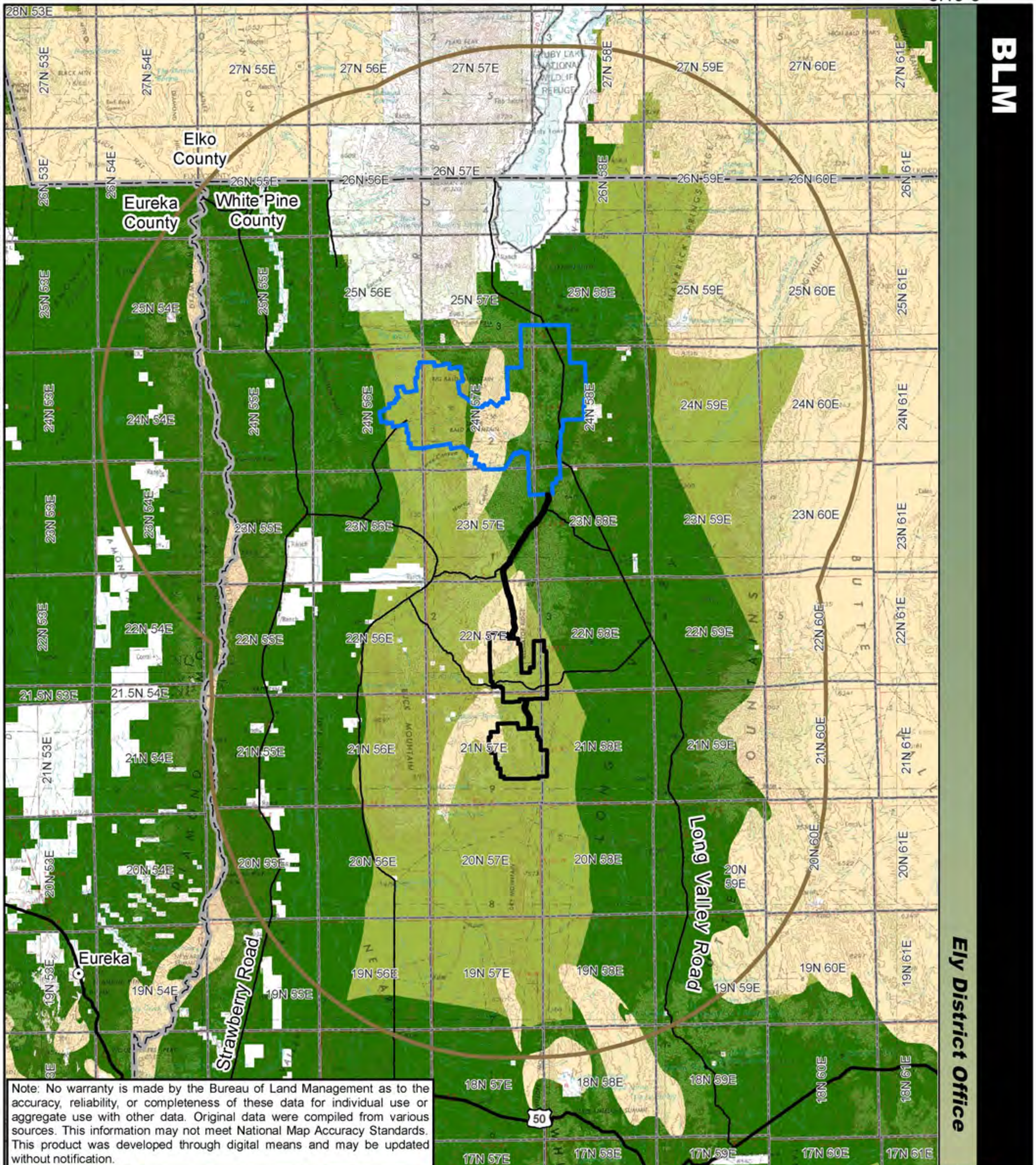

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Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Visual Resources Cumulative Effects Study Area

Visual Distance Zone Code

- Foreground-Middleground. Visibility generally up to 5 miles.
- Background. Visibility generally from 5 to 15 miles.
- Seldom Seen. Hidden from view, or not in foreground/middleground or background visibility zones.

Source: BLM 2012a, 2011g.

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.19-4

Visual Resource Inventory Distance Zones

0 2.5 5 10 Miles

N

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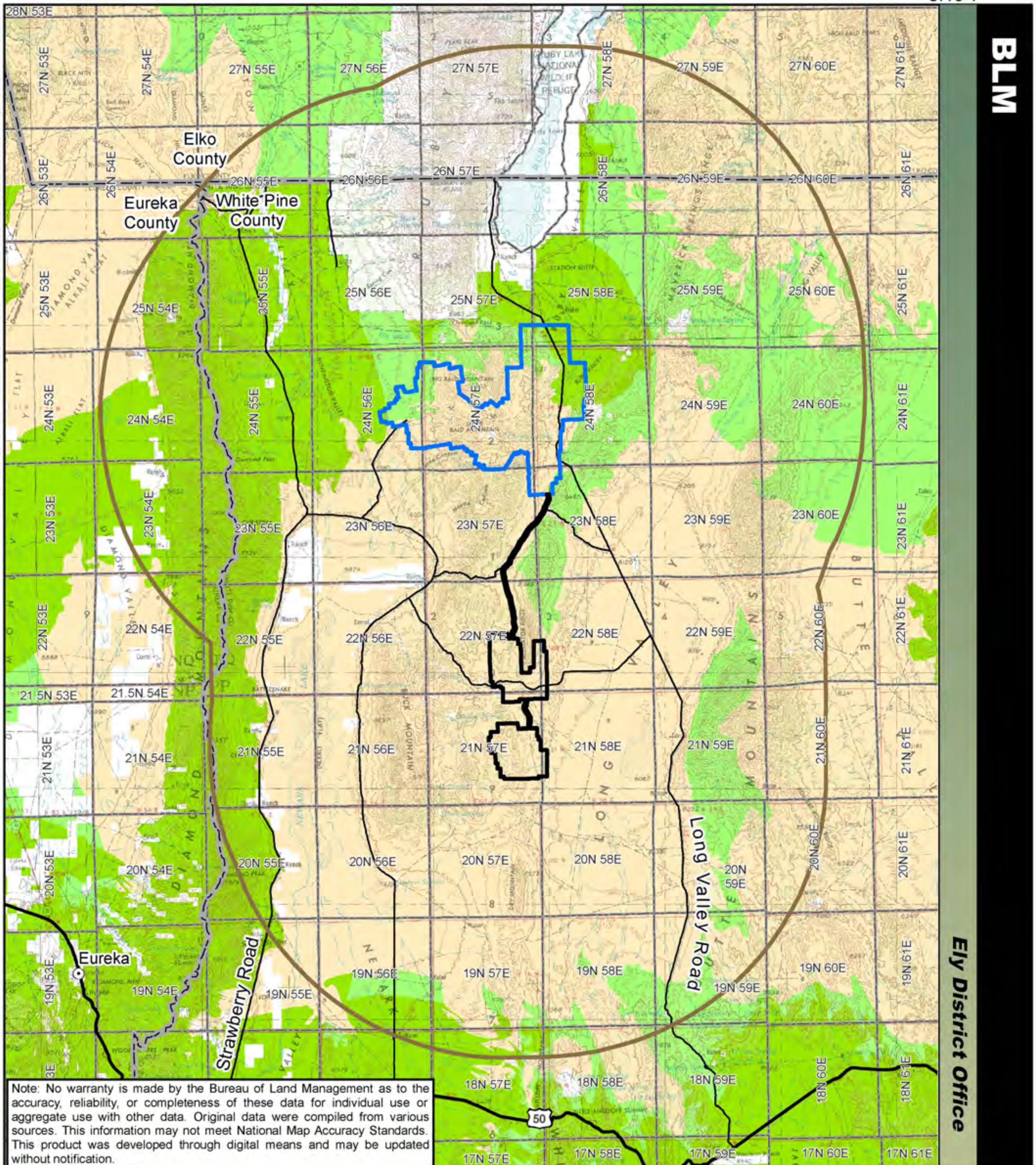


Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Visual Resources Cumulative Effects Study Area

VRI Class Code

- VRI Class I
- VRI Class II
- VRI Class III
- VRI Class IV

Source: BLM 2012a, 2011g.

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.19-5

Visual Resource Inventory Classes

0 2.5 5 10 Miles

N

7/7/2015

VRM classes (**Figure 3.19-6**) take into consideration the value of visual resources and management priorities for land uses. During the RMP process, inventory class boundaries can be adjusted as necessary to reflect resource allocation decisions made in the RMP. Management objectives established for each VRM class (BLM Handbook H-8410-1 Visual Resource Inventory) are summarized in **Table 3.19-2**.

Table 3.19-2 BLM Visual Resource Management Class Objectives

Class 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.
Class 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 changes must repeat the basic (design) elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV	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. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic (design) elements.

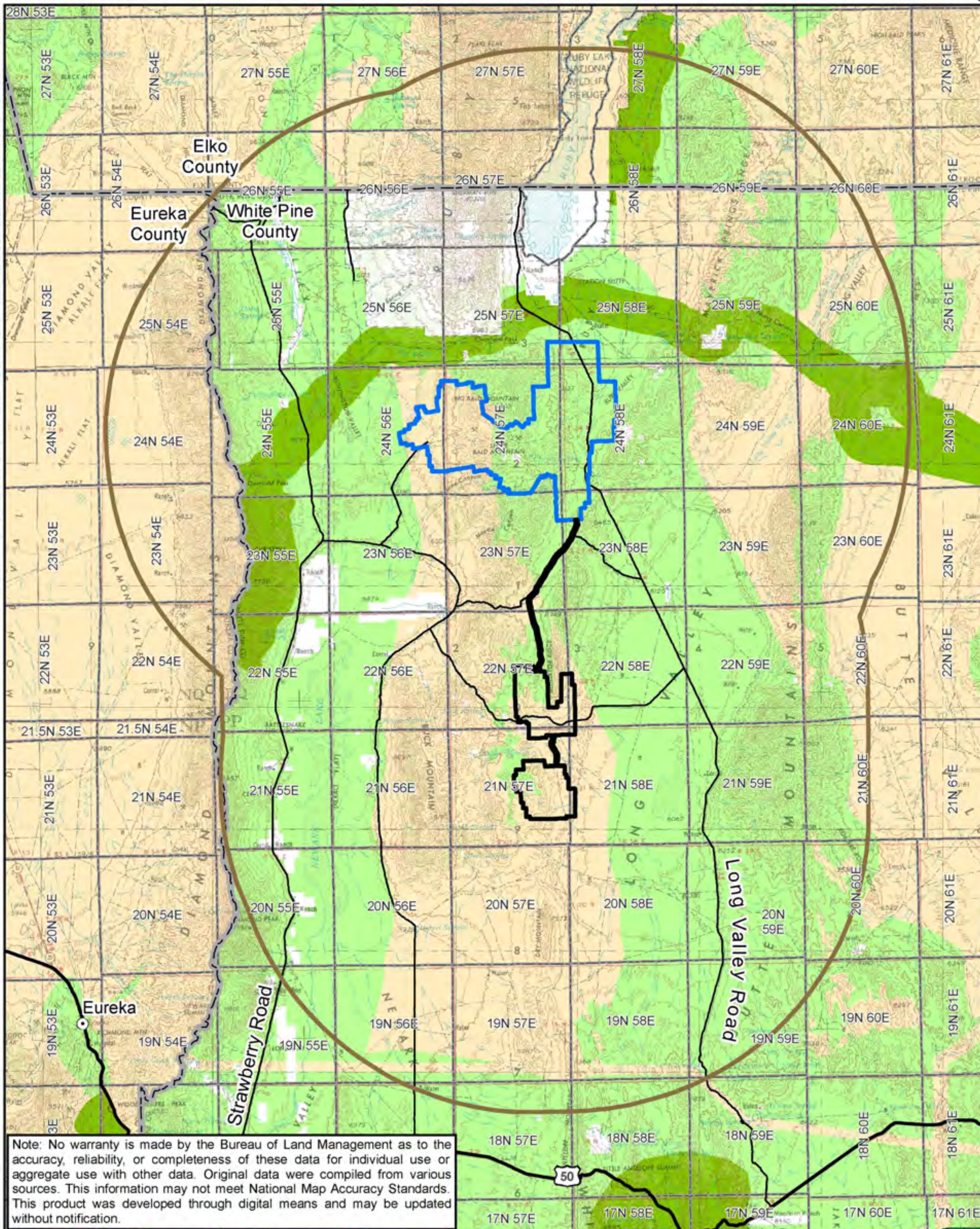
Source: BLM 1986.

The project study area is comprised of three VRM Classes: Class II, along the Pony Express Trail; Class III, in the foreground-middleground distance zone of the higher use roadways and higher sensitivity level areas near the SOA; and Class IV, in all remaining areas. The Ruby Lake NWR, South Marsh National Natural Landmark, and Fort Ruby National Historic Landmark are unclassified due to jurisdiction outside of the BLM.

The visual resources study identified nine KOPs (**Figure 3.19-1**) as the viewpoints for conducting the characteristic landscape, impacts, and VRM compliance analyses. KOP locations are as follows:

- KOP-1 has been selected due to its location on the Pony Express National Historic Trail and, secondarily, the visitor use activity at the intersection of the trail and the Strawberry Road/Nevada State Highway 892, a major visitor use area in the region. KOP-1 is located directly west of the proposed NOA Plan Boundary at the intersection of the Pony Express National Historic Trail and Strawberry Road/Nevada State Highway 892. KOP-1 represents the view of the proposed NOA Project from the west.

BLM



Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Visual Resources Cumulative Effects Study Area

VRM Class Code

- VRM Class I
- VRM Class II
- VRM Class III
- VRM Class IV

Source: BLM 2012a, 2011g.

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.19-6

Visual Resource Management Classes

0 2.5 5 10 Miles

N

Ely District Office

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7/7/2015

- KOP-2 has been selected due to its location on the Pony Express National Historic Trail and, secondarily, the visitor use activity at the intersection of the trail and the White Pine County Road 3. KOP-2 is located north of the proposed NOA Plan Boundary at the intersection of the Pony Express National Historic Trail and White Pine County Road 3. KOP-2 represents the view of the proposed NOA Project from the north.
- KOP-3 has been selected due to its location on White Pine County Road 3 in the immediate foreground of the project. KOP-3 is located in the northeastern section of the proposed NOA Plan Boundary along County Road 3. KOP-3 represents the view of the proposed NOA Project from the north in the Ruby Valley.
- KOP-4 has been selected due to its location on the recreational access road in the immediate foreground of the northern area of the SOA Project. KOP-4 is located within the northern portion of the proposed SOA Plan Boundary along a recreational and mine access road near Alligator Ridge. KOP-4 represents the view approaching the proposed SOA Project from the east.
- KOP-5 has been selected due to its location on the recreational access road in the immediate foreground of the southern area of the SOA Project. KOP-5 is located within the southern portion of the proposed SOA Plan Boundary along a recreational and mine access road. KOP-5 represents the view approaching the proposed SOA Project from the south.
- KOP-6 has been selected due to its location on White Pine County Road 3, the major recreational and residential access road in the valley. KOP-6 is located southeast of the proposed SOA Plan Boundary on White Pine County Road 3. KOP-6 represents the view approaching the proposed SOA Project from the east across Long Valley.
- KOP-7 has been selected due to its location at the water well in the Sunshine Locality historic area. KOP-7 is located southeast of the proposed SOA Plan Boundary in the Sunshine Locality historic area on a BLM recreation road. KOP-7 represents the view approaching the proposed SOA from the southeast.
- KOP-8 has been selected due to its location at the Fort Ruby National Historic Landmark visitor use area. KOP-8 is located north of the proposed NOA Plan Boundary in the Fort Ruby National Historic Landmark site on a recreational road. KOP-8 represents the view approaching the proposed NOA Project from the north.
- KOP-9 has been selected due to its location at the Ruby Stage Station historic site marker and use area. KOP-9 is located northeast of the proposed NOA Plan Boundary. KOP-9 represents the view approaching the proposed NOA Project from the north.

All of the approach routes are lightly to moderately traveled, and are the only routes to and through the area. Most traffic in the area is generated by local mineral development, ranching, recreational activity, and heritage tourism.

3.19.2 Environmental Consequences

This section discusses project related impacts to visual resources resulting from the Proposed Action, Reconfiguration Alternative, WRM Alternative, and No Action Alternative. Primary issues related to visual resources include direct and indirect impacts associated with the degradation of views from KOPs in the vicinity of the Project.

3.19.2.1 Proposed Action

Potential visual impacts associated with the proposed NOA and SOA projects were analyzed using the procedures outlined in the BLM Visual Contrast Rating Handbook H-8431-1 (BLM 1986). Impacts to landscape scenery and impacts to viewers were determined by comparing the characteristics and extents of the landforms, vegetation, and structures of the proposed Project facilities with the visual resource inventory components of scenic quality, sensitivity levels, and distance zones. Compliance with agency management objectives were determined by comparing visual contrast ratings for the proposed Project facilities with the VRM class objectives (**Table 3.19-1**) for the project vicinity, VRM Class III and VRM Class IV. The process involves comparing the degree of visual contrast from the proposed facilities and project-related activities with the existing landscape character both during active mining and after reclamation is completed. The contrast rating process used nine KOPs (**Figure 3.19-1**) as the viewpoints for conducting the impact and RMP compliance analysis.

The expansion and development of the proposed NOA and SOA projects would increase the amount of visual contrast that currently exists between existing/authorized facilities and the natural character of the landscape. The primary change in visual effects from the currently approved levels would be the addition of the RDAs, HLFs, open pits, process areas, structures, and ancillary facilities, and the electrical transmission line within the TUC. The proposed NOA and SOA projects also would extend visual effects through the increased use of the area and proposed mining activity.

As noted in Section 3.19.1, Affected Environment, prior to completion of reclamation, the existing mine features exhibit strong form and color contrast, especially under bright, clear light conditions. Moderate to strong line and landform contrasts are generated to a large extent by the shapes of the existing RDAs, HLFs, and open pits. Moderate texture contrasts are generated between the bare surfaces of the mine features and the vegetation textures and patterns in the natural landscape. The proposed NOA and SOA projects would expand the visual effects in the vicinity of the existing mine areas and adjacent undeveloped areas, and would be most prominent during active mining. The visual contrast effects gradually would become less noticeable with reclamation.

The proposed NOA and SOA facilities would have visual characteristics during active mining that would be similar to existing facilities, notably geometric forms and exposed earth surfaces. As a result, the proposed NOA and SOA projects would have similar, but expanded, visual effects to those already occurring from the existing facilities, including moderate to strong form and color contrasts, weak to moderate line contrast, and weak texture contrast. The key considerations, therefore, are the degree of expansion of the visual impacts, and the amount of allowable contrast under the VRM Class III and VRM Class IV objectives. The objective for Class III states, "…the level of change to the characteristic landscape should be moderate." The objective for Class IV states, "…the level of change to the characteristic landscape can be high."

Night sky/night lighting of the NOA and SOA operations (processing areas, machinery, vehicles, light towers, conveyors, and roadway intersections) would cause impacts to the characteristic night landscape. There would be an increase in the existing conditions in sky glow in the view from all locations, including the nine KOPs, other locations along the Pony Express National Historic Trail, at the Fort Ruby National Historic Landmark, and within the Ruby Lake NWR and the South Mark National Natural Landmark,. Greater sky glow impacts would be apparent during non-moonlit nights, from reflections on clouds, and during the clearest and darkest nights. Areas of night-time activity, such as star gazing, camping, hiking, dispersed recreation, and driving would receive higher noticeable changes to the characteristic night sky. Buildings, landforms, and vegetation nearest the light sources would be reflected by operations lighting and would have increased visibility to viewers in the surrounding landscape out to and beyond the background distance zone.

Of particular importance to users of the cultural resource is the foreground-middleground view of the NOA Project from the Pony Express National Historic Trail, a VRM Class II area. The NOA Project is located outside of the VRM Class II area and, thus, would not be expected to conform to VRM Class II objectives. Users of the Pony Express Trail would notice moderate to high contrasts to landform, vegetation, and color in the characteristic landscape. These contrasts would be lessened by the presence of existing mining operations and remnant landscapes from past mining.

Visual contrasts from the proposed NOA and SOA projects would be greatest at KOP-1, KOP-2, KOP-3, KOP-4, and KOP-5, due to their close proximities to substantial changes in the characteristic landscapes. Lighting used to facilitate around-the-clock mining would increase visual contrasts at night in the view from these KOPs. The North Poker Flats HLF would reach the skyline in the views from KOP-2, KOP-8, and KOP-9. Due to the relative scale of the RDAs, and change in color, line, form, and texture (moderate to strong contrasts) in the immediate foreground from KOP-2, KOP-3, KOP-8, and KOP-9, it is expected that the proposed facility would not achieve the requisite "moderate" level of landscape change in the short term – during active mining – for VRM Class III areas. It would be expected that the visual contrasts from facilities would be reduced after reclamation. However, the long-term visual effects (as seen from KOP-2 and KOP-3) would not be expected to achieve the VRM Class III objective unless the overall planar form of each RDA is reshaped to repeat the angular ridgelines in the background.

KOP-4 also would have strong form and color contrasts combined with moderate to strong line and texture contrasts. The mining activities in view from KOP-4 are located in VRM Class IV areas, where high levels of changes are permitted in the characteristic landscape and, as such, are in compliance with VRM objectives.

KOP-1, KOP-6, and KOP-7 would have moderate form and color contrasts combined with weak to moderate line and texture contrasts. The mining activities in view from these KOPs are located in VRM Class IV areas and, as such, are in compliance with VRM objectives.

The assessment of visual contrasts is informed by photographic simulations of the proposed NOA and SOA projects post-mining. The photographs of existing conditions, Proposed Action post-mining, and visual contract rating forms for each KOP are presented in **Appendices G1** (Visual Simulations) and **G2** (Visual Contrast Rating Forms).

Figure G-1 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-1. As shown, the proposed Redbird RDA, and reconfigured Rat West RDA and BMM 2/3 HLF Expansion would be constructed in previously disturbed views in their immediate vicinities. The visual effects of the expanded facilities would be apparent to the casual observer and would be seen as moderate impacts to scenery and viewers, because the facilities would be seen as extensions of the existing/authorized disturbances. The visual contrast rating worksheet for KOP-1 is provided in **Appendix G2**.

Figure G-2 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-2. As shown, the proposed Poker Flats and Duke Areas and Royale Area facilities on the northeastern corner of the proposed NOA would be constructed on partially disturbed land. The visual effects would be moderate because the facility would be seen as extensions of the existing/authorized disturbances. The North Poker Flats HLF would reach the skyline and, as such, would cause moderate to strong contrasts. The expanded facilities would be apparent to the casual observer from KOP-2. Other facilities would be entirely screened by intervening terrain or project landforms. The visual contrast rating worksheet for KOP-2 is provided in **Appendix G2**.

Figure G-3 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-3. As shown, the proposed South Poker Flats HLF; Winrock North, Winrock West, and Winrock East RDAs; and South Poker Flats Process Area and associated process ponds would be constructed immediately adjacent to White Pine County Road 3. As such, the visual effects would be strong, because the facilities would be seen as in the context of minimal existing/authorized disturbances. The expanded facilities would be strongly apparent to the casual observer from KOP-3. Other facilities would be entirely screened by intervening terrain or project landforms. The visual contrast rating worksheet for KOP-3 is provided in **Appendix G2**.

Figure G-4 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-4. As shown, the most prominent visible features would be the Gator HLF (300 feet high) and Gator Process Area, located

0.1 and 0.2 mile from KOP-4, respectively. Other facilities would be entirely screened by the Gator HLF or intervening terrain. The moderate to strong form, line, and color, and texture contrasts of the facility would achieve the Class IV objective during its active life. The degree of visual contrast would be further lessened with completion of reclamation. The visual contrast rating worksheet for KOP-4 is provided in **Appendix G2**.

Figure G-5 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-5. As shown, the most prominent visible features would be (from left to right) the Yankee South RDA (375 feet high), Yankee HLF (275 feet high), Yankee Process Area (0.6 mile), Gator HLF (300 feet high), and Gator South RDA (150 feet high), located 0.7, 0.5, 0.6, 4.7, and 6.0 miles from KOP-5, respectively. Other facilities would be entirely screened by intervening terrain or project landforms. The moderate to strong form, line, color, and texture contrasts of the facility would achieve the Class IV objective during its active life. The degree of visual contrast would be further lessened with completion of reclamation. The visual contrast rating worksheet for KOP-5 is provided in **Appendix G2**.

Figure G-6 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-6. From this perspective, a viewer would be able to experience broad vistas of the landscape between Alligator Ridge and Dry Mountain. The Vantage RDA would be “sky-lined” and would attract a moderate level of attention. Due to the distance (greater than 7 miles) between the observer and the proposed SOA Project, the other proposed facilities would not dominate the viewer’s attention and the existing, natural character of the landscape would be “partially retained.” Other facilities would be entirely screened by intervening terrain or project landforms. The moderate form, line, and color contrasts and weak texture contrast of the facility would achieve the Class IV objective during its active life. The degree of visual contrast would be further lessened with completion of reclamation. The visual contrast rating worksheet for KOP-6 is provided in **Appendix G2**.

Figure G-7 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-7. As shown, the most prominent visible features would be (from left to right) the Yankee South RDA (375 feet high – 6.5 miles), Yankee HLF (275 feet high – 6.6 miles), Yankee Process Area (0.6 mile), Gator HLF (300 feet high – 9.8 miles), and Gator South RDA (150 feet high – 10.8 miles). Due to the distance (greater than 6 miles) between the observer and the proposed SOA Project, the other proposed facilities would not dominate the viewer’s attention and the existing, natural character of the landscape would be “partially retained.” Other facilities would be entirely screened by intervening terrain or project landforms. The moderate form, line, and color contrasts and weak texture contrast of the facility would achieve the Class IV objective during its active life. The visual contrast rating worksheet for KOP-7 is provided in **Appendix G2**.

Figure G-8 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-8. As shown, the proposed Poker Flats and Duke Areas, Royale Area, and Winrock Area facilities on the northeastern corner of the proposed NOA Project would be constructed on partially disturbed land. The visual effects would be moderate, because the facility would be seen as extensions of the existing/authorized disturbances. The North Poker Flats HLF facility would reach the skyline and, as such, would cause moderate to strong contrasts. The expanded facilities would be apparent to the casual observer from KOP-8. Other facilities would be entirely screened by intervening terrain or project landforms. The visual contrast rating worksheet for KOP-8 is provided in **Appendix G2**.

Figure G-9 illustrates the existing condition and a simulation of visual effects as a result of implementation of the Proposed Action (post-mining) as seen from KOP-9. The proposed Poker Flats and Duke Areas, Royale Area, and Winrock Area facilities on the northeastern corner of the proposed NOA Project would be constructed on partially disturbed land. The visual effects would be moderate, because the facility would be seen as extensions of the existing/authorized disturbances. The North Poker Flats HLF facility would reach the skyline and, as such, would cause moderate to strong contrasts. The expanded facilities would be apparent to the casual observer from KOP-9. Other facilities would be entirely screened by intervening terrain or project landforms. The visual contrast rating worksheet for KOP-9 is provided in **Appendix G2**.

Design features and ACEPMs are summarized in Section 2.4.3, Design Features and Applicant-committed Environmental Protection Measures, for the Proposed North and South Operations Area Projects. Design features and ACEPMs specific to visual impacts focus facility design, phased construction, concurrent reclamation, and the use of anti-glare light fixtures. Successful reclamation standards would include the recontouring of disturbed areas to blend with the natural topography, stabilization of erosion, and the establishment of an acceptable vegetative cover in accordance with Nevada Guidelines for Successful Revegetation. Reclamation goals and criteria, concurrent and proposed reclamation timelines, and post-reclamation monitoring standards are described in Section 2.4.4, Reclamation.

3.19.2.2 North and South Operations Area Facilities Reconfiguration Alternative

Under the Reconfiguration Alternative, the impacts to viewers at KOP-2, KOP-8, and KOP-9 would be reduced substantially as compared to the Proposed Action. This is due to the removal in the North Operations Area of the Royale Pit, Royale North RDA, Royale South RDA, North Poker Flats HLF, Winrock HLF, Winrock Process Area, and associated ancillary facilities, which would have been visible from KOP-2, KOP-8, and KOP-9. **Figures G-2, G-8,** and **G-9** illustrate the existing condition and a simulation of visual effects as a result of implementation of the Reconfiguration Alternative (post-mining) as seen from KOP-2, KOP-8, and KOP-9, respectively. In addition, the impacts to viewers at KOP-3 would be lessened as compared to the Proposed Action, due to the removal of the Winrock HLF and Winrock Process Area. **Figure G-3** illustrates the existing condition and a simulation of visual effects as a result of implementation of the Reconfiguration Alternative (post-mining) as seen from KOP-3. Impacts to viewers at KOP-4 would be reduced substantially due to the removal in the South Operations Area of the Gator HLF, Gator Process Area, and associated ancillary facilities, which would have been in the immediate foreground. **Figure G-4** illustrates the existing condition and a simulation of visual effects as a result of implementation of the Reconfiguration Alternative (post-mining) as seen from KOP-4. In addition, the impacts to viewers at KOP-5, KOP-6, and KOP-7 would be lessened as compared to the Proposed Action. **Figures G-5**, **G-6**, and **G-7** illustrate the existing condition and a simulation of visual effects as a result of implementation of the Reconfiguration Alternative (post-mining) as seen from KOP-5, KOP-6, and KOP-7, respectively. All other visual impacts of the Reconfiguration Alternative would be similar to the impacts of the Proposed Action in that visible facilities would be in the same location as for the Proposed Action. The visual contrast rating worksheets for KOP-1, KOP-2, KOP-3, KOP-4, KOP-5, KOP-6, KOP-7, KOP-8, and KOP-9 are provided in **Appendix G2**.

3.19.2.3 Western Redbird Modification Alternative

Under the WRM Alternative, the impacts to viewers at the KOPs would be the same as described for the Reconfiguration Alternative with the following exception. Impacts to viewers at KOP-1 would be reduced in comparison to the Reconfiguration Alternative due to the reduction of the Redbird RDA and Pit footprints, which would have been visible from KOP-1. **Figure G-10** illustrates the existing condition and a simulation of visual effects as a result of implementation of the WRM Alternative (post-mining) as seen from KOP-1. The visual contrast rating worksheets for this alternative for KOP-1 is provided in **Appendix G2**.

3.19.2.4 No Action Alternative

Under the No Action Alternative, the proposed NOA and SOA projects would not be developed and associated impacts to visual resources would not occur. Barrick would continue its operations, closure, and reclamation activities within the NOA and SOA boundaries under the terms and current permits and approvals as authorized by the BLM and State of Nevada. Under the No Action Alternative, construction of all previously authorized expansion and associated facilities would be implemented and reclaimed as authorized.

3.19.2.5 Cumulative Impacts

The CESA for visual resources is shown in **Figure 3.19-1** and consists of a 15-mile BLM VRM background distance zone. Past and present actions and RFFAs are discussed in Section 2.7, Past, Present, and Reasonably Foreseeable Future Actions; their locations are illustrated in **Figure 2.7-1**.

Past and present actions have resulted, or would result, in approximately 18,413 acres of total surface disturbance within the visual resources CESA. The total quantifiable surface disturbances are related to mining, oil and gas development, wind energy development, exploration, land, road, and utility corridor development, agriculture, livestock grazing; residential developments, and other county and government actions. RFFAs proposed within the visual resources CESA include, but are not limited to, the following: oil and gas lease sales within the Long, Ruby, and Huntington valleys (acreage unknown), and vegetation treatments (totaling 34,672 acres).

Among these actions, the past and present actions and RFFAs projects associated with mining would be the most likely to introduce visual contrast within the visual resources CESA; however, there is potential for vegetation treatments to result in more vistas of previously hidden natural and man-made features such as rock outcroppings, ridge lines, homes on private land, abandoned mines, pipelines, and roads (BLM 2013a). All of the identified RFFAs would be located in VRM Class III and VRM Class IV areas. It is anticipated that the visual disturbance would meet the standards of the VRM Class IV objective, which provide for major change in the landscape. It is anticipated that the RDAs and HLFs proposed for the Ruby Valley area would not meet the VRM Class III objective, which provide for “moderate change” in the landscape, unless reshaped to repeat the form elements of the background topography. Implementation of the Reclamation Plan and the assumption that standard reclamation requirements would be required for permitting of future projects, the cumulative effects to visual resources would be minimized to the degree possible after completion of future projects.

The Proposed Action incrementally would remove 11 acres of authorized disturbance from the 18,413 acres of past and present actions and incrementally increase disturbance to visual resources by an additional 6,903 acres resulting in a total cumulative disturbance of approximately 59,977 acres (5 percent of the total visual resources CESA). The 6,903 acres of disturbance would result in moderate long-term impacts to scenery for viewers traversing the Pony Express National Historic Trail, viewers at the Fort Ruby National Historic Landmark, South Marsh National Natural Landmark, Ruby Stage Station area and Sunshine Locality historic area, viewers in areas of dispersed recreation, and viewers traveling along roads and trails. Strong contrasts of form, line, and color would not be in compliance with VRM Class III objectives and would be in compliance with Class IV objectives. Short-term contrasts would be greater than long-term contrasts and would lessen with time and the reclamation process.

The Reconfiguration Alternative would remove 1,986 acres of authorized disturbance from the 18,413 acres of past and present actions and incrementally increase surface disturbance by an additional 5,175 acres resulting in a total cumulative disturbance of approximately 56,274 acres (5 percent of the total visual resource CESA). The NOA and SOA Project Reconfiguration Alternative would result in lower long-term impacts than the Proposed Action and contrasts would comply with both VRM Class III and Class IV objectives. The WRM Alternative would remove 234 acres of previously authorized disturbance and 402 acres of new disturbance proposed under the Reconfiguration Alternative for a total cumulative disturbance of approximately 55,368 acres (5 percent of the total cultural resource CESA).

Under the No Action Alternative, cumulative impacts to visual resources would be the same as those described in the *Final Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project*, as follows: and “Visual resources in the cumulative effects study area have been affected by past, present, and reasonably foreseeable future actions. Projects that could have impacts visible from the Pony Express Trail are the most problematic since this is the most visually sensitive area within the cumulative effects study area. The Proposed Action would add cumulatively to the disturbances seen within the long range viewshed of this trail, but would not impact the 1-mile buffer of the Class II management area around the trail. The great majority of cumulative impacts would last until natural vegetation has become established in disturbed areas, which could take many years. Until then, form and color change would be apparent with altered vegetation communities. Open pits and structures associated with some proposed actions would be permanent. Most of the disturbances in the study area, including the Proposed Action, are within Class III and IV VRM areas. Class IV allows for strong contrast, while Class III allows for moderate contrast. Most of the Class III designations are along travel routes most visible to the public. These areas also are subject to periodic developments where the final design and/or reclamation should be such that only moderate visual contrast would occur, thus preserving the overall aesthetic appeal of the region. The Proposed Action would add cumulatively to these disturbances." (BLM 2009a). Also applicable is the *Environmental Assessment for the Mooney Heap and Little Bald Mountain Expansion Project, as follows: "*Sensitive receptors within the CESA include users of the Ruby Mountains and the Ruby Lake NWR. The Pony Express Trail is included within a Class II visual resource management corridor to the north of the Plan area. Past and present land-disturbing projects and activities within the CESA have resulted in visual impacts which can be seen by viewers within the CESA, including portions of the Pony Express Trail. Reasonably foreseeable future actions also would contribute to visual resource impacts through land clearing activities and facility construction. The effects of mining projects would last until successful reclamation is completed; however, visual impacts such as color and texture changes may remain much longer. The Proposed Action includes the development of roads, RDAs, pit expansions, and the installation of three new radio towers. These actions would occur within an area which is already highly disturbed making the addition of these disturbances negligible within the CESA" (BLM 2011a).

Pending completion of successful reclamation on all project components with the exception of open pits and backfill areas, it is anticipated that the Proposed Action, Reconfiguration Alternative, and WRM Alternative would contribute less than 1 percent to the overall cumulative disturbance within the visual resources CESA. Although, successful reclamation would minimize visual impacts to the extent possible, the additional cumulative visual impacts of the project landforms' shapes, lines, and colors would be noticeable to the casual observer in both the short and long term.

3.19.2.6 Monitoring and Mitigation Measures

Issue: Consistency with BLM standards for coloration of exterior facility surfaces.

Mitigation Measure VR-1: For the proposed NOA and SOA projects, to be consistent with disturbed soils within the mine boundary, new facilities and buildings within the mined area would be painted the color Carlsbad Canyon as listed on the BLM Environmental Color Chart. New facilities and buildings outside of the mined area that would be surrounded with vegetation or at the tree line would be painted the color Shadow Gray, as listed on the BLM Environmental Color Chart.

Effectiveness: These two colors, Carlsbad Canyon and Shadow Gray, would reduce color-related contrasts for the casual observer.

3.19.2.7 Residual Impacts

Although successful reclamation would minimize visual impacts to the extent possible, the large-scale forms and lines of the proposed facilities would remain visible for the Proposed Action, Reconfiguration Alternative, and WRM Alternative. These changes would result in residual adverse effects to visual resources.

3.20 Hazardous Materials and Solid Waste

The study area for hazardous materials and solid waste is defined as the proposed NOA and SOA plan boundaries as well as the primary access roads such as State Highway 278 from Carlin, Nevada to Eureka, Nevada; U.S. Highway 50 from Eureka east to State Highway 892 (Strawberry Road); State Highway 892 (Strawberry Road) to the proposed NOA and SOA projects; and U.S. Highway 50 from Ely, Nevada to White Pine County Road 3 (Long Valley Road). These areas and routes were chosen because they are the areas and routes that would be impacted by hazardous materials storage, use and transportation and disposal of waste in permitted on-site disposal areas.

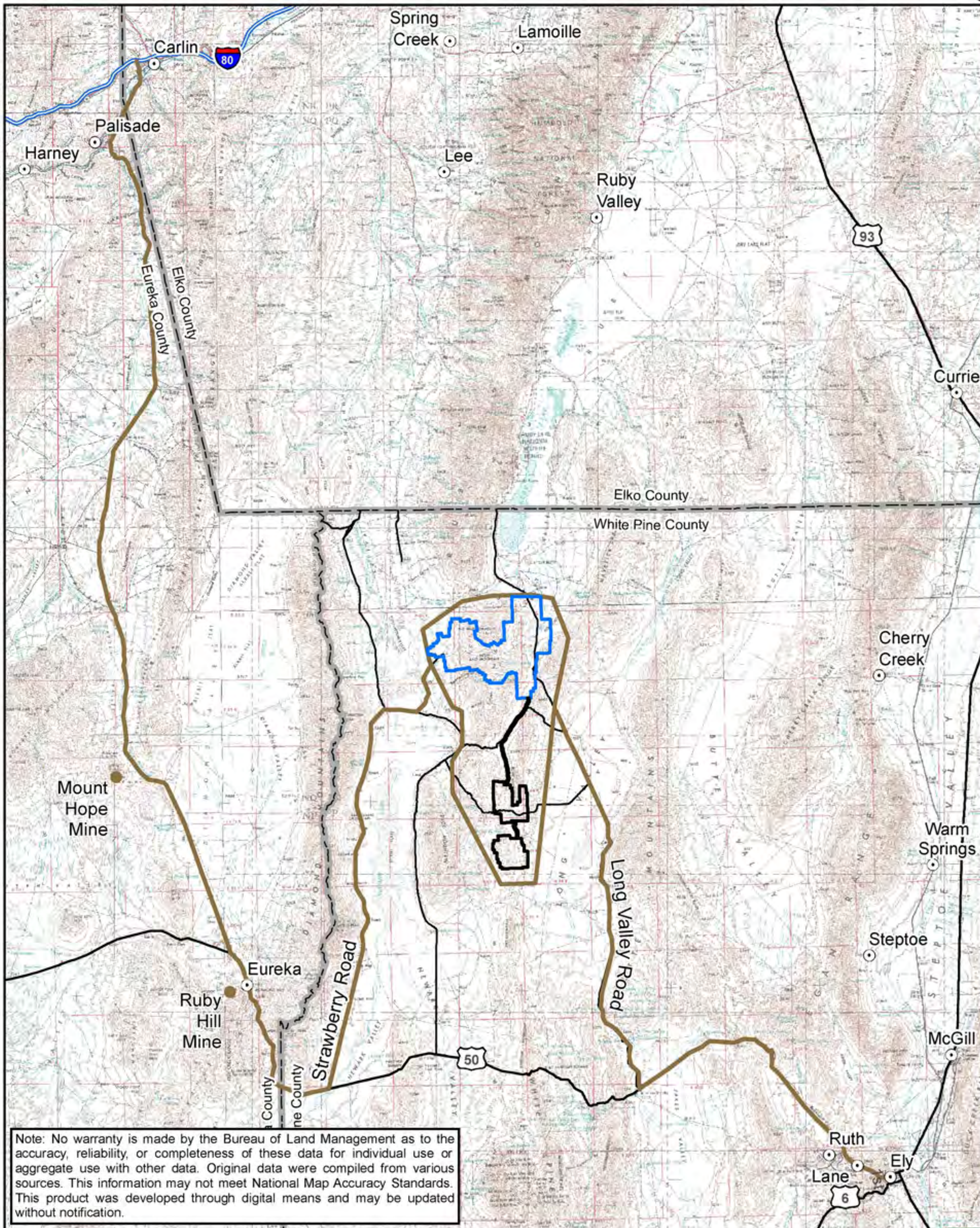
The CESA for hazardous materials and solid waste would include the study area as defined above, the Authorized Regional Exploration Boundary, the Ruby Hill Mine, and Mount Hope Project Area. The CESA was chosen because it includes areas to be impacted by the proposed NOA and SOA projects as well as other mining-related activities that would likely contribute to hazardous materials transportation and use and waste disposal in reasonable proximity to the proposed NOA and SOA projects. **Figure 3.20-1** illustrates the study area and CESA for hazardous materials and solid waste.

3.20.1 Affected Environment

3.20.1.1 Regulatory Framework

Hazardous materials, which are defined in various ways under a number of regulatory programs, can represent potential risks to both human health and the environment when not properly managed. The term hazardous materials include the following materials that may be utilized or disposed of in conjunction with mining operations:

- Substances covered under Occupational Safety and Health Administration and MSHA Hazard Communication Standards (29 CFR 1910.1200 and 30 CFR 42): The types of materials that may be used in mining activities and that would be subject to these regulations would include almost all of the materials identified in **Tables 2.4-38** and **2.4-54**. **Tables 2.4-38** and **2.4-54** summarize the existing average annual usage for chemical consumables necessary to construct and operate the existing/authorized NOA and SOA, respectively.
- Hazardous materials as defined under USDOT regulations 49 CFR, Parts 170-177: The types of materials that may be used in mining activities and that would be subject to these regulations would include sodium cyanide, explosives, cement, fuels, some paints and coatings, and other chemical products.
- Hazardous substances as defined by the CERCLA and listed in 40 CFR Table 302.4: The types of materials that are designated as hazardous substances that are used in mining activities and that would be subject to these requirements would include sodium cyanide; solvents; solvent-containing materials (e.g., paints, coatings, degreasers); acids; and other chemical products.
- Hazardous waste as defined in the RCRA: Procedures in 40 CFR 262 are used to determine whether a waste is a hazardous waste. The types of materials used in mining activities and that may be subject to these requirements could include liquid waste materials with a flash point of less than 140°F, spent solvent containing waste, corrosive liquids, and lab assay waste. Hazardous waste is regulated under Subtitle C of the RCRA. Any hazardous substances and extremely hazardous substances as well as petroleum products such as gasoline, diesel, or propane, are subject to reporting requirements if volumes on hand exceed threshold planning quantities under Sections 311 and 312 of SARA. The types of materials that may be used in mining activities and that would be subject to these requirements would include fuels, coolants, acids, and solvent-containing products such as wet paints and coatings.



Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Legend

- Proposed NOA Plan Boundary
- Proposed SOA Plan Boundary
- Hazardous Materials and Solid Waste Study Area and Cumulative Effects Study Area

Bald Mountain Mine North and South Operations Area Projects EIS

Figure 3.20-1

Hazardous Materials and Solid Waste Study Area and Cumulative Effects Study Area

0 2.5 5 10 Miles

Source: Barrick 2012a,b; BLM 2012a.

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BLM

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- Petroleum products defined as “oil” in the Oil Pollution Act of 1990: The types of materials used in mining activities and that would be subject to these requirements include fuels, lubricants, hydraulic oil, and transmission fluids.

In conjunction with the definitions noted above, the following lists provide information regarding management requirements during transportation, storage, and use of particular hazardous chemicals, substances, or materials:

- The SARA Title III List of Lists or the Consolidated List of Chemicals Subject to Emergency Planning and Community Right-to-Know Act and Section 112(r) of the CAA.
- The USDOT listing of hazardous materials in 49 CFR 172.101.

Certain types of materials, while they may contain potentially hazardous constituents, are specifically exempt from regulation as hazardous waste. Used oil, for example, may contain toxic metals, but would not be considered a hazardous waste unless it meets certain criteria. Other waste that might otherwise be classified as hazardous are managed as “universal waste” and are exempted from hazardous waste regulations as long as they are handled in ways specifically defined by regulation. An example of a material that could be managed as a universal waste is lead-acid batteries. As long as lead-acid batteries are recycled appropriately, requirements for hazardous waste do not apply.

Pursuant to regulations promulgated under CERCLA, as amended by SARA, release of a reportable quantity of a hazardous substance to the environment must be reported within 24 hours to the National Response Center (40 CFR Part 302). The NAC (445A.347) also requires immediate reporting of a release of a reportable quantity of a hazardous substance to the Nevada Division of Emergency Management. In addition, under the State of Nevada WPCP program, all releases of a reportable quantity must be reported as soon as possible, but not later than 24 hours after the event, to the NDEP Bureau of Corrective Actions; and a spill report would be provided to NDEP. Nevada regulates the storage and handling of certain defined “highly hazardous substances” under NAC 459.952-459.9542. The Nevada State Fire Marshal requires that storage of hazardous materials above certain specified thresholds obtain a permit under NAC 459.9918 (Nevada State Fire Marshal and State Emergency Response Commission 2008).

3.20.1.2 Regulatory Definition of Solid Waste

Solid waste consists of a broad range of materials that include garbage, refuse, wastewater treatment plant sludge, non-hazardous industrial waste, and other materials (solid, liquid, or contained gaseous substances) resulting from industrial, commercial, mining, agricultural, and community activities (USEPA 2006). Solid waste is regulated under different subtitles of the RCRA and includes hazardous waste (discussed in the previous section) and non-hazardous waste. Non-hazardous waste is regulated under RCRA Subtitle D. In Nevada, solid waste rules are found in the NAC. Disposal of solid waste is regulated under NAC 444.570-444.7499; disposal of hazardous waste is regulated under NAC 444.850-444.8746.

<u>Solid Waste Generated from Current Mining Operations</u>

Solid waste that is currently generated at the existing/authorized NOA includes non-hazardous waste and hazardous waste (Section 2.4.1.17, Hazardous Materials). Non-hazardous waste includes glass, plastics, paper, wood, used tires and non-hazardous laboratory wastes which are disposed of at the currently authorized BMM and Saga Class III-waivered landfills. Another nonhazardous waste stream is PCS and is currently managed in the existing/authorized NOA at on-site treatment units. The volume of PCS generated annually totals approximately 700 cubic yards (Barrick 2012a). When PCS treatment meets requirements as specified in the current BMM PCS Management Plan, it can be disposed in predetermined areas within the mine permit area.

The existing BMM NOA and Mooney Basin areas are classified as a Small Quantity Generator of hazardous waste as defined by the RCRA (USEPA 2006). Most of the hazardous waste would consist of spent solvent and used paint. Other waste consists of universal waste (fluorescent lights, batteries), and used products (used oil and antifreeze).

3.20.1.3 Spills and Contaminated Sites

The SWPPP summarizes a record of spills that have occurred from February 2008 to November 2010. The SWPPP indicated that fuels and petroleum oils were involved in the majority of on-site spills (Barrick 2012a,b). The spilled amounts ranged from 5 to 400 gallons and the impacted media was soil which was excavated and transferred to the PCS treatment facilities. Barren solutions and cyanide solutions were the other materials spilled and spill amounts ranged from 100 to 2,000 gallons. The spills impacted soil which was excavated and placed at the Mooney HLF. Only two incidents at the mine were listed on the NDEP Corrective Actions database: 1) a gasoline spill (reported as a closed site) and 2) a motor oil spill reported as an open site (NDEP 2012b).

3.20.2 Environmental Consequences

This section discusses project related impacts to hazardous materials and solid waste resulting from the Proposed Action, Reconfiguration Alternative, WRM Alternative, and No Action Alternative. Primary issues related to hazardous materials and solid waste include the possibility of an accidental release from on-site storage and use areas, or during transportation to or from the site.

3.20.2.1 Proposed Action

The Proposed Action would utilize the transportation routes as shown in **Figure 2.4-6**. Process chemicals and fuel would continue to be transported by truck along the highways in the region, using the identified routes. Trucks also would continue to transport small quantities of hazardous waste on an infrequent basis. Potential impacts would involve the continuation of the hazardous material and waste management practices currently in use and previously analyzed (BLM 2009a). It is anticipated that the Proposed Action would not result in a change to the current classification of Small Quantity Generator of hazardous waste for the proposed NOA and SOA projects.

For the proposed NOA, the existing Class III-waivered landfills would continue to be used to dispose non-hazardous waste as described in Section 2.4.1.17, Hazardous Materials. For the proposed SOA, an additional landfill would be constructed within the proposed Vantage and Yankee South RDA disturbance areas which would accept non-hazardous waste. For both the proposed NOA and SOA projects, used oil, antifreeze, solvents, and batteries would continue to be recycled at approved off-site facilities. Existing off-site facilities have the capacity for current projected future waste of this type that would result from the Proposed Action (approximately a 20 to 30 percent increase over current). Fuel storage would continue in aboveground tanks with secondary containment structures capable of containing 110 percent of the volume of the largest tank. Engineering controls, which help to reduce exposure to potential hazards through isolation and containment (including leak detection) of fuel and chemicals during storage and use, in addition to actions included in the Spill Contingency Plan and the Emergency Response Plan (Barrick 2012a,b) reduce the risk of an on-site chemical or fuel release. As a result, the risk of chemical or fuel release to the environment would continue to be more likely during transportation operations to and from the proposed NOA and SOA projects under the Proposed Action. The probability of that type of a release is described in detail below.

<u>Probability of a Release</u>

Process chemicals, fuel, and waste materials could be accidentally released during transport to and from the proposed NOA and SOA projects. The Proposed Action would require the continuation of transport of the materials and quantities shown in **Tables 2.4-38** and **2.4-53**. As shown, the Proposed Action would increase the quantities of primary fuels and reagents from those currently utilized.

The probability of a truck accident involving hazardous materials was estimated in the *Final Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project* (BLM 2009a) using accident and release statistics for truck shipments of hazardous materials (Bastelle 2001). The primary emphasis in the previous analysis was placed upon the release of liquid material that could pose an immediate human health hazard or an off-site contaminant hazard. The following analysis would use the same statistical analysis as that used in the *Final Environmental Impact Statement for the Bald Mountain Mine North Operations Area Project*.

A risk analysis of a transportation-related release of liquid sodium cyanide, diesel fuel, and hydrochloric acid was performed using the anticipated volumes of materials to be transported to the proposed NOA and SOA as listed in **Tables 2.4-38** and **2.4-53**. The analysis considers the proposed NOA and SOA projects separately since the operational lives of each area are different. **Tables 3.20-1** and **3.20-2** provide a potential incident analysis of the transportation of hazardous materials to the proposed NOA Project and proposed SOA Project, respectively. For the analysis, it was assumed that the main transportation route is State Highway 278 from Carlin to Eureka; followed by U.S. Highway 50 from Eureka east to State Highway 892 (Strawberry Road); then from State Highway 892 (Strawberry Road) to the proposed NOA or SOA projects, a one-way trip of approximately 150 miles.

These results indicate a low probability of an accidental release of hazardous materials to the environment during the estimated life of the Proposed Action. The probability of a release to the environment in a populated area would be many times less than the estimates shown in **Tables 3.20-1** and **3.20-2** since most of the route is located in rural areas. A detailed description of the potential effects of such a release are described in detail below.

Table 3.20-1 North Operations Area Project Potential of Hazardous Material Transportation Incidents

Material/ USDOT Hazardous Material Category[1]	Annual Use (gallons)	Approximate Shipment Quantity (gallons)	Number of Shipments Life-of-Mine[2]	Distance (miles)[3]	Incident per Mile[4]	Incident Probability[5]
Diesel Fuel and Gasoline / 3	10,000,000	20,500	9,740	1,461,000	0.0000007	1.02
Sodium Cyanide / 6.1	3,800,000	6,250	12,160	1,824,000	0.0000008	1.46
Hydrochloric Acid / 8	83,300	4,200	400	60,000	0.0000004	0.024

1 Hazardous Material Category (USDOT Pipeline and Hazardous Material Safety Administration [PHMSA] 2012).

2 20-year operational life of mine (number of shipments x 20 years).

3 150 miles one-way from I-80 from Carlin, Nevada.

4 Table 25, page 4-13, Battelle (2001), includes accidents and en-route leaks, but not loading/unloading incidents.

5 Incident probability = distance X (incident rate).

Table 3.20-2 South Operations Area Project Potential of Hazardous Material Transportation Incidents

Material/USDOT Hazardous Material Category[1]	Annual Use (gallons)	Approximate Shipment Quantity (gallons)	Number of Shipments Life of Mine[2]	Distance (miles)[3]	Incidents Per Mile[4]	Incident Probability[5]
Diesel Fuel / 3	7,500,000	20,500	6,935	1,040,250	0.0000007	0.73
Sodium Cyanide / 6.1	1,600,000	6,250	4,864	729,600	0.0000008	0.58
Hydrochloric Acid / 8	Not applicable, not a primary chemical to be used.					

1 Hazardous Material Category (USDOT PHMSA 2012).

2 19-year operational life of mine (number of shipments x 19 years).

3 150 miles one-way from I-80 from Carlin, Nevada.

4 Table 25, page 4-13, Battelle (2001), includes accidents and en-route leaks, but not loading/unloading incidents.

5 Incident probability = distance X (incident rate).

Effects of a Release

The environmental effects of a release would depend on the substance, quantity, timing, and location of the release. This analysis considers the potential for off-site release incidents during transportation, but does not indicate a volume or location. The event could range from a minor oil spill on the project site where cleanup equipment would be readily available to a large fuel or chemical spill during transportation. Some of the chemicals could have immediate adverse effects on water quality and aquatic resources if a spill were to enter a flowing stream or a spring or wetland area. However, considering the transportation routes, the probability of a spill entering a wetland or other waterway would be low. Therefore, it is unlikely that spills of these materials would impact waterways. Rapid response to any spills and subsequent cleanup actions would lessen adverse effects to the impacted media.

As stated previously, the primary emphasis in this analysis is placed upon the release of liquid material that could pose an immediate human health hazard or an off-site contaminant hazard (hydrochloric acid, diesel fuel, and sodium cyanide). However, other fuels and reagents including ethylene glycol, methanol, propane, ammonium nitrate, sodium hydroxide, and calcium oxide would continue to be delivered to the proposed NOA and SOA projects and stored on-site (**Tables 2.4-38** and **2.4-54**). The transportation of these materials also represents a potential for an off-site release during transportation and these materials are subject to response, reporting, and cleanup procedures as the chemicals that receive primary emphasis in this analysis.

Hydrochloric acid spills that occur on the ground or in water would have the potential to impact local populations of aquatic and terrestrial life through the oxidizing action that destroys plant and animal cells. An acid spill into a waterway would have the potential to migrate from the initial spill site.

A release of diesel fuel would have the potential to impact soil, water, wildlife, and vegetation resources. A spill into a waterway would cause contamination of water and soil, likely affecting local aquatic populations. A spill to the ground would impact soils and potentially any vegetation in the spill area.

The effect of a sodium cyanide release would be more variable than a release of diesel fuel or hydrochloric acid and would depend on the amount of the release, the location of the release (e.g., dry upland area, wetland area, or flowing stream), the organisms exposed, and the chemical conditions at the release location. The release of sodium cyanide would likely cause the poisoning of aquatic and terrestrial species depending on exposure and concentrations. Environmental effects of a cyanide spill would be short-term and limited in extent due to the fairly rapid natural degradation of cyanide in the environment due to the natural cyanide cycle (Ghosh et al. 2006).

However, the small quantities of hazardous waste that would be generated and transported by the Proposed Action, combined with the very low probability of accidental release (**Tables 3.20-1** and **3.20-2**), would result in a very low risk of the previously described effects on the human and natural environment.

Public Safety

Any large-scale release of these chemicals could have implications for public health and safety. The location of the release would again be a primary factor in determining its importance; however, the probability of a release is very low, as is the probability of a release in a populated area. Therefore, it is highly unlikely that a release affecting human health or safety would occur during the life of the proposed NOA and SOA projects.

In the event of a release during transport, the commercial transportation company would be responsible for first response and cleanup. Local and regional law enforcement and fire protection agencies also may be involved to secure the site and protect public safety. In the event of an accident involving hazardous substances, the carrier must notify local emergency response personnel. The release of a reportable quantity of a hazardous substance must be reported to the appropriate state and federal agencies within the specified timeframes. The Emergency Response Plan (Barrick 2012a,b) would include a plan for the response of mine resources to off-site transportation hazardous material releases.

3.20.2.2 North and South Operations Area Facilities Reconfiguration Alternative

The Reconfiguration Alternative would use and transport the same amounts and types of hazardous materials and waste on an annual basis as the Proposed Action; however, the mine life is 10 years for this alternative compared with 20 years for the Proposed Action. As a result, the amount of hazardous materials and waste generated for this alternative would be approximately half of the Proposed Action over the life of the mine. The number of hazardous materials shipments, miles traveled, and calculated number of incidents over the mine life would be expected to be reduced by approximately half compared with the Proposed Action (**Tables 3.20-1** and **3.20-2**). There would be a low probability of an accidental release of hazardous materials to the environment over the life of the mine for this alternative.

3.20.2.3 North and South Operations Area Facilities Western Redbird Modification Alternative

The WRM Alternative would use and transport the same amounts and types of hazardous materials and waste on an annual basis as the Reconfiguration Alternative. Due to the reduction and/or modification of facility footprints under the WRM Alternative, the number of hazardous materials shipments, miles traveled, and calculated number of incidents over the mine life could be reduced in comparison with the Reconfiguration Alternative. There would be a low probability of an accidental release of hazardous materials to the environment over the life of the mine for this alternative.

3.20.2.4 No Action Alternative

Under the No Action Alternative, the proposed NOA and SOA projects would not be developed and associated impacts to hazardous materials and solid waste would not occur. Barrick would continue its operations, closure, and reclamation activities within the NOA and SOA boundaries under the terms and current permits and approvals as authorized by the BLM and State of Nevada. Under the No Action Alternative, construction of all previously authorized expansion and associated facilities would be implemented and reclaimed as authorized. Hazardous materials currently used would continue to be used in volumes as approved, and no increase of volume of materials would occur. The Spill Contingency Plan and the Emergency Response Plan (Barrick 2012a,b) would continue to be implemented, reducing the risk of spills and potential contamination. Solid waste would continue to be disposed according to applicable regulations.

3.20.2.5 Cumulative Impacts

The CESA for hazardous materials and solid waste would include the study area as defined above, the Authorized Regional Exploration Boundary, the Ruby Hill Mine, and Mount Hope Project Area (**Figure 3.20-1**). Past and present actions and RFFAs are discussed in Section 2.7, Past, Present, and Reasonably Foreseeable Future Actions; their locations are illustrated in **Figure 2.7-1**.

Past projects that received chemical shipments on the routes analyzed in this assessment include the existing Bald Mountain Mine, Mooney Basin Operations Area, Little Bald Mountain Mine (collectively the existing BMM NOA), Casino/Winrock Mine, White Pine Mine, Yankee Mine, and Alligator Ridge Mine. These properties were responsible for operating in accordance with applicable regulations, and there are no known current environmental impacts from the delivery of chemicals along the analyzed transportation routes from these operations. The existing NOA currently receives chemical shipments and stores hazardous materials and waste on-site in accordance with applicable local, state, and federal requirements. As described in Section 3.20.1.3, Spills and Contaminated Sites, spills were small and the impacts have been small and isolated. Other present actions which may involve the analyzed transportation routes include mineral exploration activities, exploratory oil and gas wells, and maintenance activities along utility corridors. These activities bring increased vehicle traffic and may involve the transport of small amounts of chemicals to the various sites within the hazardous materials and solid waste CESA. Increased traffic on the access roads also increases the potential for vehicle collision with a supply vehicle.

The RFFAs (all mining-related activities) shown in **Table 2.7-4** could cause an increase in vehicular traffic on the analyzed transportation routes. These routes include U.S. Highway 50, State Highway 93, State Highway 892 (Strawberry Road), and White Pine County Road 3 (Long Valley Road). Data indicates that peak traffic volumes occurred on these highways in 2005 and 2006, after which volumes dropped (see Section 3.15, Land Use and Access, for details). RFFAs that include new mining projects and oil and gas projects would transport material along these same routes.

The Proposed Action, Reconfiguration Alternative, and WRM Alternative would be one of the larger potential contributors to the cumulative hazardous materials and solid waste CESA. The Proposed Action, Reconfiguration Alternative, and WRM Alternative would cause an estimated 20 to 30 percent increase in fleet operational use. This would result in a corresponding increase in hazardous materials transport over the 21-year mine life for the Proposed Action and 10-year mine life for the Reconfiguration Alternative and WRM Alternative. It is impossible to determine how much actual overlap there would be traffic with the Proposed Action or other action alternatives, and other RFFAs. However, these increases, based on previous peak numbers, are unlikely to exceed the safe capacity of these aforementioned roads. For example, White Pine County Road 3 (Long Valley Road) currently operates at a LOS A with all cumulative existing traffic. Cumulatively, traffic numbers and transport of hazardous materials would increase, which in turn, would increase the likelihood of vehicle collisions and material spills on the access roads. However, given the low probability of a hazardous material release due to vehicle accident, it would be expected that the cumulative increase in risk would be low.

With the continued, proper implementation of the Spill Contingency Plan and the Emergency Response Plan (Barrick 2012a,b) for on- and off-site incidents, cumulative impacts associated with storage, use, and transportation of hazardous materials are expected to be small. Proper disposal of solid waste also would limit the risk of potential impacts.

3.20.2.6 Monitoring and Mitigation Measures

The transportation and use of hazardous materials and the generation and disposal of solid wastes are regulated by federal and state regulations and should be sufficient to provide protection to the environment and public health. Therefore, no additional monitoring and mitigation measures are recommended.

3.20.2.7 Residual Impacts

Residual adverse effects from the use of hazardous materials under the Proposed Action, Reconfiguration Alternative, or WRM Alternative would depend on the substance, quantity, timing, location, and response involved in the event of an accidental spill or release. Operational compliance with applicable regulations and in accordance with the Spill Contingency Plan and the Emergency Response Plan (Barrick 2012a,b) as well as the prompt cleanup of spills and releases would minimize the risk of residual adverse effects due to accidental spills or releases of hazardous materials. Sodium cyanide can be acutely toxic, but does not persist in the environment for a long period of time. Regulations governing the transportation, storage, use, and disposal of hazardous materials have greatly reduced the potential for residual effects due spills of hazardous materials. Proper disposal of non-hazardous solid waste in the permitted landfills would minimize residual effects with regard to such materials.

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3.21 Relationship between Short-term Uses of the Human Environment and the Maintenance and Enhancement of Long-term Productivity

As described in Section 3.1, Introduction, short-term is defined as the 25-year construction and operational life of the Proposed Action, also including the initial phases of reclamation. For the Reconfiguration Alternative and WRM Alternative, short-term is defined as the 15-year construction and operational life including the initial years of the reclamation period. Long-term is defined as the remainder of the reclamation period, followed by closure, reclamation monitoring, and post-closure monitoring (i.e., beyond 25 years for the Proposed Action; beyond 15 years for the Reconfiguration and WRM alternatives). This section identifies the tradeoffs between the short-term uses of environmental resources during construction, operation, and reclamation versus the long-term productivity of environmental resources that would extend beyond the end of reclamation.

The short-term use of resources during the construction, operation, and initial phases of reclamation for the Proposed Action, Reconfiguration Alternative, and WRM Alternative would result in beneficial impacts such as additional local employment and the generation of revenue.

The proposed NOA and SOA projects would result in various short-term uses with adverse impacts involving the temporary loss of soil and vegetation productivity and the associated loss of wildlife habitat; possible wildlife avoidance and displacement; temporary reduction in the livestock grazing area and an associated loss of AUMs; temporary increases in fugitive dust; and temporary reduction in dispersed recreation opportunities. These short-term uses would occur on approximately 4,773 to 6,903 acres (depending on alternative), and are expected to end upon completion of construction, operations, and successful reclamation. Short-term uses would be minimized through implementation of ACEPMs.

Long-term productivity (i.e., including and following project reclamation) would primarily depend on the effectiveness of the proposed reclamation of the disturbance areas. Successful reclamation would provide for post-mining wildlife, wild horses, and livestock grazing by establishing self-sustaining plant communities. Revegetation also is expected to stabilize disturbed surfaces and control erosion. It is estimated that long-term productivity would be lost on approximately 780 to 1,210 acres of area (depending on alternative) that would be permanently disturbed due to creation of open pits which would not be backfilled or reclaimed. This would cause a long-term loss in soil and vegetation productivity and associated terrestrial wildlife habitat and livestock forage, associated loss of AUMs, and potential long-term loss to dispersed recreation on public lands. Although some avian species could use un-reclaimed pit walls for nesting habitat once mining operations cease, these areas would not be considered to provide equal habitat suitability in comparison to natural topographic features.

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3.22 Irreversible and Irretrievable Commitment of Resources

The Proposed Action, Reconfiguration Alternative, WRM Alternative could result in the irreversible commitment of resources (e.g., the loss of future options for resource development or management, especially of nonrenewable resources such as minerals or cultural resources) or the irretrievable commitment of resources (e.g., the lost production or use of renewable natural resources during the life of the Proposed Action, Reconfiguration Alternative or WRM Alternative operations). Irreversible and irretrievable impacts as a result of implementation of the Proposed Action, Reconfiguration Alternative and WRM Alternative are summarized for each resource in **Table 3.22-1**.

Table 3.22-1 Irreversible and Irretrievable Commitment of Resources by the Proposed Action, Reconfiguration Alternative, and WRM Alternative

Resource	Irreversible Impacts	Irretrievable Impacts	Proposed Action Explanation	Reconfiguration Alternative Explanation	WRM Alternative Explanation
Geology and Minerals	Yes	Yes	Approximately 279 MT of gold ore would be mined during operations. This would result in the irreversible and irretrievable commitment of the minerals extracted from the ore.	Approximately 245 MT of gold ore would be mined during operations.	Approximately 195 MT of gold ore would be mined during operations.
Water Quality and Quantity	No	Yes	Groundwater levels affected by groundwater pumping for water supply and pit dewatering are predicted to recover in the long term. The total estimated volume of groundwater extracted over the mine life is 43,452 acre-feet. This volume of water would be removed from the groundwater system and consumed for operational use. This permanent extraction of groundwater is considered an irretrievable commitment of resources.	Groundwater levels affected by groundwater pumping for water supply and pit dewatering are predicted to recover in the long term. The total estimated volume of groundwater extracted over the mine life is 21,126 acre-feet. This volume of water would be removed from the groundwater system and consumed for operational use. This permanent extraction of groundwater is considered an irretrievable commitment of resources.	Groundwater levels affected by groundwater pumping for water supply and pit dewatering are predicted to recover in the long term. The total estimated volume of groundwater extracted over the mine life is 20,225 acre-feet. This volume of water would be removed from the groundwater system and consumed for operational use. This permanent extraction of groundwater is considered an irretrievable commitment of resources.
Soils and Reclamation	Yes	Yes	Suitable growth media would be salvaged from the proposed disturbance areas for use in reclamation. There would be a temporary loss of soil productivity and irretrievable commitment of this resource on approximately 6,903 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of soil productivity and irreversible commitment of this resource on approximately 1,210 acres associated with open pit and pit backfill areas, which would not be reclaimed.	Suitable growth media would be salvaged from the proposed disturbance areas for use in reclamation. There would be a temporary loss of soil productivity and irretrievable commitment of this resource on approximately 5,175 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of soil productivity and irreversible commitment of this resource on approximately	Suitable growth media would be salvaged from the proposed disturbance areas. There would be a temporary loss of soil productivity and irretrievable commitment of this resource on approximately 4,773 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of soil productivity and irreversible commitment of this resource on approximately 780 acres associated with open pit and pit backfill areas, which would not be reclaimed.

Table 3.22-1 Irreversible and Irretrievable Commitment of Resources by the Proposed Action, Reconfiguration Alternative, and WRM Alternative

Resource	Irreversible Impacts	Irretrievable Impacts	Proposed Action Explanation	Reconfiguration Alternative Explanation	WRM Alternative Explanation
				885 acres associated with open pit and pit backfill areas, which would not be reclaimed.	
Vegetation	Yes	Yes	There would be a temporary loss of vegetation productivity and irretrievable commitment of this resource on approximately 6,903 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of vegetation productivity and irreversible commitment of this resource on approximately 1,210 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of vegetation productivity and irretrievable commitment of this resource on approximately 5,175 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of vegetation productivity and irreversible commitment of this resource on approximately 885 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of vegetation productivity and irretrievable commitment of this resource on approximately 4,773 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of vegetation productivity and irreversible commitment of this resource on approximately 780 acres associated with open pit and pit backfill areas, which would not be reclaimed.
Wildlife and Fisheries	Yes	Yes	There would be a temporary loss of wildlife habitat and irretrievable commitment of this resource on approximately 6,903 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of wildlife habitat and irreversible commitment of this resource on approximately 1,210 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of wildlife habitat and irretrievable commitment of this resource on approximately 5,175 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of wildlife habitat and irreversible commitment of this resource on approximately 885 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of wildlife habitat and irretrievable commitment of this resource on approximately 4,773 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of wildlife habitat and irreversible commitment of this resource on approximately 780 acres associated with open pit and pit backfill areas, which would not be reclaimed.

Table 3.22-1 Irreversible and Irretrievable Commitment of Resources by the Proposed Action, Reconfiguration Alternative, and WRM Alternative

Resource	Irreversible Impacts	Irretrievable Impacts	Proposed Action Explanation	Reconfiguration Alternative Explanation	WRM Alternative Explanation
Special Status Species and Migratory Birds	Yes	Yes	There would be a temporary loss of special status wildlife and migratory bird habitat and irretrievable commitment of this resource on approximately 6,903 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of special status wildlife and migratory bird habitat and irreversible commitment of this resource on approximately 1,210 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of special status wildlife and migratory bird habitat and irretrievable commitment of this resource on approximately 5,175 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of special status wildlife and migratory bird habitat and irreversible commitment of this resource on approximately 885 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of special status wildlife and migratory bird habitat and irretrievable commitment of this resource on approximately 4,773 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of special status wildlife and migratory bird habitat and irreversible commitment of this resource on approximately 780 acres associated with open pit and pit backfill areas, which would not be reclaimed.
Livestock Grazing	Yes	Yes	There would be a temporary loss of livestock grazing opportunity (508 AUMs) and irretrievable commitment of this resource on approximately 6,903 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of livestock grazing opportunity (89 AUMs) and irreversible commitment of this resource on approximately 1,210 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of livestock grazing opportunity (381 AUMs) and irretrievable commitment of this resource on approximately 5,175 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of livestock grazing opportunity (64 AUMs) and irreversible commitment of this resource on approximately 885 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of livestock grazing opportunity (350 AUMs) and irretrievable commitment of this resource on approximately 4,773 acres during operation, until reclamation is completed. Additionally, there would be a permanent loss of livestock grazing opportunity (64 AUMs) and irreversible commitment of this resource on approximately 780 acres associated with open pit and pit backfill areas, which would not be reclaimed.

Table 3.22-1 Irreversible and Irretrievable Commitment of Resources by the Proposed Action, Reconfiguration Alternative, and WRM Alternative

Resource	Irreversible Impacts	Irretrievable Impacts	Proposed Action Explanation	Reconfiguration Alternative Explanation	WRM Alternative Explanation
Wild Horses	Yes	Yes	There would be a temporary loss of wild horse habitat and irretrievable commitment of this resource on approximately 6,879 acres within the Triple B HMA during operation, until reclamation is completed. Additionally, there would be a permanent loss of wild horse habitat and irreversible commitment of this resource on approximately 1,210 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of wild horse habitat and irretrievable commitment of this resource on approximately 5,149 acres within the Triple B HMA during operation, until reclamation is completed. Additionally, there would be a permanent loss of wild horse habitat and irreversible commitment of this resource on approximately 885 acres associated with open pit and pit backfill areas, which would not be reclaimed.	There would be a temporary loss of wild horse habitat and irretrievable commitment of this resource on approximately 4,747 acres within the Triple B HMA during operation, until reclamation is completed. Additionally, there would be a permanent loss of wild horse habitat and irreversible commitment of this resource on approximately 780 acres associated with open pit and pit backfill areas, which would not be reclaimed.
Paleontological	No	No	The risk of disturbance to unique or site-specific paleontological resources would be very low.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.
Cultural	Yes	Yes	A total of 573 cultural sites would be affected by the proposed NOA and SOA projects. Of these, 59 are eligible for the NRHP, 412 are not eligible, 3 are unevaluated, 13 could not be relocated, 10 have been mitigated, and 76 have been destroyed. These impacts would be both irretrievable and irreversible.	A total of 421 sites would be affected. Of these 45 are eligible for the NRHP, 281 are not eligible, 2 are unevaluated, 7 could not be relocated, 9 have been mitigated, and 77 have been destroyed by previous disturbance.	A total of 418 sites would be affected. Of these 46 are eligible for the NRHP, 277 are not eligible, 2 are unevaluated, 7 could not be relocated, 9 have been mitigated, and 77 have been destroyed by previous disturbance.
Native American Traditional Values	No	No	To date, no traditional cultural properties or places of cultural and religious importance have been identified by tribal representatives participating in the ongoing Native American consultation process. However, the Yomba Shoshone	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.

Table 3.22-1 Irreversible and Irretrievable Commitment of Resources by the Proposed Action, Reconfiguration Alternative, and WRM Alternative

Resource	Irreversible Impacts	Irretrievable Impacts	Proposed Action Explanation	Reconfiguration Alternative Explanation	WRM Alternative Explanation
			Tribe did identify concerns regarding potential impacts on groundwater. The irreversible and irretrievable potential impacts to groundwater are disclosed above under the Water Quality and Quantity row.		
Air Quality	No	No	Project emissions would not exceed federal or state AAQS. Air quality would return to existing conditions upon completion of the proposed NOA and SOA projects.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.
Land Use and Access	No	No	There would be no irreversible or irretrievable impacts to land use or access; public access patterns would be maintained.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.
Recreation	Yes	Yes	There would be an irretrievable commitment to dispersed recreation on approximately 6,903 acres of public land during operations, until reclamation is achieved. Additionally, there would be an irreversible commitment to dispersed recreation on approximately 1,210 acres of public lands associated with open pit and pit backfill areas, which would not be reclaimed. There would be no irreversible or irretrievable impacts to wilderness.	There would be an irretrievable commitment to dispersed recreation on approximately 5,175 acres of public land during operations, until reclamation is achieved. Additionally, there would be an irreversible commitment to dispersed recreation on approximately 885 acres of public lands associated with open pit and pit backfill areas, which would not be reclaimed. There would be no irreversible or irretrievable impacts to wilderness.	There would be an irretrievable commitment to dispersed recreation on approximately 4,773 acres of public land during operations, until reclamation is achieved. Additionally, there would be an irreversible commitment to dispersed recreation on approximately 780 acres of public lands associated with open pit and pit backfill areas, which would not be reclaimed. There would be no irreversible or irretrievable impacts to wilderness.
Social and Economic	No	No	There would be increased employment for construction and operation personnel during the life of the proposed NOA and	Irreversible and irretrievable commitments of resources would be the same as that described	Irreversible and irretrievable commitments of resources would be the same as that described under the

Table 3.22-1 Irreversible and Irretrievable Commitment of Resources by the Proposed Action, Reconfiguration Alternative, and WRM Alternative

Resource	Irreversible Impacts	Irretrievable Impacts	Proposed Action Explanation	Reconfiguration Alternative Explanation	WRM Alternative Explanation
Values			SOA projects. State and local government revenues also would benefit. There would be no irretrievable or irreversible commitment of community resources.	under the Proposed Action.	Proposed Action.
Visual Resources	Yes	Yes	Permanent visual changes would result from construction of the open pits, HLFs, and RDAs. Impacts would be reduced through successful reclamation of the heaps and RDAs, but open pits would not be reclaimed. The resulting visual impacts of the project landforms' shapes, lines, and colors would be noticeable to the casual observer over the long-term and would represent an irreversible and irretrievable visual impact.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.
Environmental Justice	No	No	No disproportionate adverse environmental impacts are anticipated to any minority populations.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.
Hazardous Materials and Solid Waste	No	No	No irreversible impacts or irretrievable commitment of resources are anticipated in relation to hazardous materials or solid wastes; however, if a spill were to affect a sensitive resource, an irretrievable impact could occur pending the cleanup of that spill and subsequent recovery of the resource.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.	Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.

3.23 Energy Requirements and Greenhouse Gas Emissions

Ongoing scientific research has identified anthropogenic GHG emissions as potential impacts to the global climate. Through complex interactions on a global scale, GHGs lead to a net warming of the atmosphere. GHGs are gasses that trap heat in the atmosphere by decreasing the amount of heat radiated by the earth back into space. Although there are many GHGs (water vapor, methane, nitrous oxide [N_2O], O_3, fluorine, chlorine, bromine), the most notable is CO_2. Industrialization and the burning of fossil fuels have increased the levels of CO_2 in the atmosphere. Because CO_2 is the most prevalent GHG, the USEPA references all GHG emissions to what they term carbon dioxide equivalent (CO_2e). The Intergovernmental Panel on Climate Change concluded that "both past and future anthropogenic CO_2 emissions would continue to contribute to warming and sea level rise for more than a millennium, due to the time scales required for removal of this gas from the atmosphere" (IPCC 2007a).

According to the USEPA, the atmospheric concentration of CO_2 has increased approximately 39 percent since the beginning of the industrial age primarily as a result of fossil fuels combustion (USEPA 2014). Additionally, the global average temperature has risen by 1.4°F over the past century and is expected to raise another 2°F to 11.5°F over the next century (USEPA 2012b). Increasing the GHG emissions to the atmosphere is expected to accelerate this temperature change.

3.23.1 Regulatory Framework

The USEPA and CEQ have implemented regulations and guidelines regarding evaluation of GHG emissions and climate change, and the manner in which NEPA documents should address these issues. The U.S. Supreme Court on April 2, 2007, ruled that the USEPA had authority to regulate GHGs as pollutants and required the USEPA to determine whether GHGs cause or contribute to global warming (USEPA 2008). In 2008, Congress directed the USEPA to publish a mandatory GHG reporting rule based on USEPA's existing authority under the CAA. On October 30, 2009, the USEPA published a final rule for the mandatory reporting of GHGs (40 CFR Part 98) from large GHG emissions sources in the U.S. Implementation of 40 CFR Part 98 is referred to as the Greenhouse Gas Reporting Program (USEPA 2010b,c).

CEQ guidance requires the consideration of a proposed project's potential GHG emissions and the potential effects of climate change on a project in NEPA reviews of proposed federal actions. On February 8, 2010, the CEQ released a draft guidance memorandum to federal agencies regarding their treatment of GHG emissions and climate change impact issues within the NEPA process (CEQ 2010). The guidance addresses two related issues: 1) the treatment of GHG emissions that directly or indirectly may result from a proposed federal action, such as the permitting of a proposed project; and 2) the analysis of potential climate change impacts on a proposed federal action. Within the CEQ guidance, the threshold of 25,000 metric tpy of CO_2e GHG emissions per year are suggested as a "useful, presumptive, threshold for discussion and disclosure…because it has been used and proposed in rule-makings under the Clean Air Act" (CEQ 2010).

The evaluation of GHG emissions and climate change impacts within this EIS is based on the CEQ draft guidance memorandum regarding the treatment of GHG emissions and climate change impacts within a NEPA document (CEQ 2010). Specifically, the guidance recommends consideration of:

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

The CEQ guidance acknowledges that the nature of a proposed action and its relationship to climate change must be considered to determine the level of analysis appropriate to a specific NEPA document.

In addition, the USEPA (USEPA 2013) organizes GHG emission sources into "scopes" according to the type of impact, direct or indirect, of the emissions.

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

3.23.2 Applicability of Greenhouse Gas Emissions and Climate Change to the Proposed Project

Recent scientific evidence suggests there is a direct correlation between global warming and emissions of GHGs. GHGs include CO_2, methane, nitrogen oxide, and O_3. Although many of these gases occur naturally in the atmosphere, man-made sources substantially have increased the emissions of GHGs over the past several decades. Of the man-made GHGs, the greatest contribution currently comes from carbon dioxide emissions.

Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks (i.e., vegetation) cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused GHG concentrations to increase dramatically, and are a possible contributor to overall global climatic changes (IPCC 2007b). Potential changes to the project area resulting from the effects of climate change forecasted by the Central Basin and Range Rapid EcoRegional Assessment (REA) could include higher than normal growing season temperatures, contraction or expansion of some existing vegetation communities, the expansion of existing noxious weed populations, and the introduction of noxious weed species previously undocumented in the ecoregion and project area (Comer et al. 2013). Regarding temperature increases specifically, the Central Basin and Range REA forecasts an average increase in average summer maximum daytime temperatures of approximately 5°F within the BMM project area by 2060 (Comer et al. 2013). These increases in average growing season temperatures are anticipated to result in low elevation basins throughout the Central Basin and Range ecoregion potentially transitioning from the existing cool semi-desert vegetation communities into very warm and sparsely-vegetated desert landscapes more typical of the Mojave Basin and Range.

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

3.23.3 Energy Consumption and Greenhouse Gas Emissions for the Proposed Action, Reconfiguration Alternative, and WRM Alternative

Annual emissions of GHGs (CO_2e, which include CO_2, methane, and N_2O) from construction and operations sources are directly related to the consumption of fuels (combustion). Purchased power also contributes to GHG emissions at the power plants that furnish power to the grid supplying power to the proposed NOA and SOA projects. GHG emissions for the proposed NOA and SOA projects are generated from direct combustion of fossil fuels, dominated by diesel, but also including propane used for process heating and from indirect GHG emissions associated with electrical power consumption.

GHG emissions are primarily created by the combustion of fuel by process sources, insignificant sources, and by mobile mining equipment. Under the Proposed Action, the process and insignificant sources have an estimated facility-wide potential to emit 23,694 tpy of CO_2e. Under the Proposed Action, the mobile mining equipment (i.e., non-road engines) has an estimated facility-wide potential to emit 166,128 tpy of CO_2e (Air Sciences 2013a). **Table 3.23-1** summarizes the GHG (CO_2e) emissions per year under the Proposed Action. The GHG (CO_2e) emissions per year under the Reconfiguration Alternative and WRM Alternative would also be consistent with those values shown in **Table 3.23-1**. Although GHG emissions would be similar on an annual basis, total GHG emissions generated over the 10-year mine life of the Reconfiguration Alternative and WRM Alternative would be approximately half of the total GHG emissions generated for the 20-year mine life of Proposed Action.

Table 3.23-1 Greenhouse Gas Emissions under the Proposed Action

Case	Fuel GHG Emissions (tpy)	Propane Gas-related GHG Emissions (tpy)	Power GHG Emissions (tpy)	Total GHG Emissions (tpy)
Proposed Action (Stationary Sources)	0	23,694	4,207	27,901
Proposed Action (Mobile Sources)	166,128	-	0	166,128
Proposed Action Total	**166,128**	**23,694**	**4,207**	**194,029**

Source: Air Sciences 2013a.

3.23.4 Cumulative Impacts

Total GHG emissions from the Proposed Action, Reconfiguration Alternative, and WRM Alternative would be an estimated 194,029 tpy. Total GHG emissions generated over the 10-year life of mine for Reconfiguration Alternative and WRM Alternative would be approximately half of the total GHG emissions generated over the 20-year mine life for the Proposed Action. These emissions would contribute cumulatively to global annual GHG emissions, which total an estimated 41 billion metric tons (Emissions Database for Global Atmospheric Research 2012). As stated previously, cumulative GHG emissions have been linked with accelerated global climate change (IPCC 2007a; National Research Council 2010).

3.23.5 Monitoring and Mitigation Measures

The GHG emissions from the proposed Project would be the result of the use of required equipment. There is no effective mitigation to prevent these emissions.

3.23.6 Residual Impacts

Residual GHG would include all estimated emissions totaling 194,029 tpy under the Proposed Action and 97,015 tpy under both the Reconfiguration Alternative and WRM Alternative.

4.0 Consultation and Coordination

This chapter summarizes the agency and public consultation and coordination conducted in support of this EIS process.

4.1 Public Participation

This environmental document was prepared in consultation and coordination with various federal, state, and local agencies, organizations, and individuals. Agency consultation and public participation have been accomplished through a variety of formal and informal methods, including scoping meetings, responses to e-mails, meetings with individual public agencies and non-governmental organizations.

Public involvement in the EIS process includes the steps necessary to identify and address public concerns and needs. The public involvement process assists agencies in: 1) broadening the information base for decision making; 2) informing the public about proposed actions and potential long-term impacts that could result from proposed NOA and SOA projects; and 3) ensuring that public needs are understood by the agencies.

Public participation is required by NEPA at four specific points in the EIS process: scoping period, review of Draft EIS, review of Final EIS, and receipt of the ROD.

- Scoping: The public is provided a 30-day scoping period to provide potential issues and concerns associated with the Proposed Action. Public input obtained during scoping is combined with issues identified by lead and cooperating agencies to form the scope of the alternatives and analysis in the EIS.
- Draft EIS Review: A 45-day Draft EIS comment period is initiated by publication of a Notice of Availability for the Draft EIS in the Federal Register. This allows the public to review and provide comment on the alternatives considered and the impact analysis in the Draft EIS. These public comments are combined with comments from lead and cooperating agencies to form the basis for revising the Draft EIS into the Final EIS.
- Final EIS Review: A 30-day Final EIS review period is initiated by publication of a Notice of Availability for the Final EIS in the Federal Register.
- ROD: Subsequent to the 30-day review period for the Final EIS, a ROD is prepared.

4.1.1 Scoping

The BLM initiated the scoping process by publishing a NOI to prepare an EIS in the Federal Register on April 16, 2012. Public scoping meetings were conducted on May 7, 8, 9, and 10 in Ely, Elko, Eureka, and Reno, Nevada, respectively.

The scope of this EIS reflects input received from the public and the appropriate government agencies. Key issues identified during the scoping process include the following:

- Water Resources
  - Potential impacts to water drawdown of the aquifers;
  - Potential impacts to surface and groundwater quantities;

  - Request to complete a characterization of the surface waters and springs and gain an understanding of groundwater movement; and
  - Potential impacts to water quality (e.g., dewatering, contaminated ponds, HLFs, and RDAs).
- Ruby Lake NWR
  - Potential impacts to the historic setting and cultural resources at the Ruby Lake NWR.
  - Potential impacts to visual resources and change in scenic values at the Ruby Lake NWR.
  - Concerns regarding degraded environmental quality and biological integrity of the Ruby Lake NWR.
  - Potential impacts regarding the alteration of the groundwater regime and the relict dace, Ruby Valley's only native fish species.
  - Potential impacts to the Ruby Marshes from fugitive dust containing mercury and arsenic.
  - Potential impacts to valuable wildlife habitat and recreational opportunities.
- Wildlife and Special Status Species
  - Potential impacts to greater-sage grouse, a potential candidate for listing under the ESA.
  - Potential impacts to bald eagles and/or golden eagles, their habitat, and regional populations.
  - Potential impacts to mule deer migration within the proposed SOA and NOA plan boundaries.
- Wild Horses
  - Potential impacts to designated HMAs.
  - Potential impacts to wild horses and burro herds from groundwater drawdown and/or contamination.
- Social and Economic Values
  - Potential impacts to Eureka County infrastructure without the benefits of tax revenues.

4.1.2 Public Review of the Draft EIS

The 45-day public comment period on this Bald Mountain Mine North and South Operations Area Projects Draft EIS will begin upon publication of the NOA of the Draft EIS in the Federal Register.

4.2 Consultation and Coordination with Federal, State and Local Agencies

The NDOW, USFWS, White Pine County, Eureka County and the State of Nevada Sagebrush Ecosystem Program are serving as cooperating agencies for the preparation and review of this EIS. Issues related to agency consultation and review included mining regulation and reclamation, biological resources, wild horses, socioeconomics, and land and water management. Cultural resource consultations apply to the potential for impacts to important historic, archaeological or traditional sites important to Native Americans.

The USFWS provided input on the potential for federally listed, proposed, and candidate species within the proposed NOA and SOA projects. USFWS also provided comments associated with water quality, visual impacts in relation to cultural settings, biological resources, and noise impacts to the Ruby Lake NWR.

The USEPA provided input on a wide variety of topics including: the development of alternatives mitigation measures, surface water and groundwater quality and quantity, management of leachate, waste rock management, closure and reclamation, air quality, waters of the U.S., sensitive species, ecological risk, environmental justice, and socioeconomic.

As the state agency with jurisdiction and special expertise related to impacts on wildlife, the NDOW provided input on important big game ranges, potential adaptive management strategies, small game including greater sage-grouse brooding and nesting habitat, sensitive species, nongame species, habitat loss, closure and reclamation, and surface water and groundwater quality and quantity.

White Pine County provided input on issues related to potential employment opportunities and socioeconomic impacts to county residents. Eureka County also provided input on issues relating to potential employment opportunities, socioeconomic impacts to county residents, and potential impacts to water quantity and quality.

4.3 Consultation with Tribes

Under EO 13084, the BLM is required to establish regular and meaningful consultation and collaboration with Native American tribal governments on the development of regulatory policies and issuance of permits that could significantly or uniquely affect their communities. On June 11, 2012, the BLM initiated government-to-government consultation for the proposed NOA and SOA projects (entitled Bald Mountain Mine Project EIS) by sending letters to the following federally recognized Native American tribes: South Fork Band Council, Ely Shoshone Tribe of Nevada, Battle Mountain Band Council, Wells Band Council, Te-Moak Tribe of the Western Shoshone Indians of Nevada, Confederated Tribes of the Goshute Indian Reservation, Duckwater Shoshone Tribe of the Duckwater Reservation, Moapa Band of Paiute Indians of the Moapa River Reservation, Yomba Shoshone Tribe of the Yomba Reservation, and Las Vegas Paiute Tribe of the Las Vegas Indian Colony. The letters were sent to inform the various tribes of the proposed undertaking and to solicit their concerns regarding the possible presence of properties of traditional religious and cultural importance in the study area.

Prior to the government-to-government consultation letter, the BLM sent a letter to the Native American tribes listed in **Table 3.13-1** informing them of the aforementioned public scoping meetings. The meetings offered the public an opportunity to learn more about the proposed NOA and SOA projects, ask questions, and express any concerns they may have with the proposed NOA and SOA projects.

On July 2, 2012, the BLM had a face-to-face meeting with the Duckwater Shoshone Tribe of the Duckwater Reservation to provide updates on the proposed NOA and SOA projects and to discuss any concerns the Tribe may have regarding the proposed NOA and SOA projects. The Tribe expressed no concerns during the meeting. On August 10, 2012, the BLM had a face-to-face meeting with the Yomba Shoshone Tribe also to provide updates on the proposed NOA and SOA projects and to discuss any tribal concerns. During the meeting, the Tribe expressed concerns with potential adverse effects to groundwater during mining operations and closure, and how the EIS would describe mitigation recommendations to avoid environmental consequences.

The BLM continues to provide opportunities to meet and coordinate with tribal governments and interested tribal members to address their concerns and to work together in developing appropriate measures to protect sites of tribal importance or concern that may be identified within the study area.

4.4 List of Agency, Tribal, and Private Organization Contacts

While preparing the Draft EIS for the proposed NOA and SOA projects, the BLM communicated with and received input from various federal, state, and local agencies, and tribal and private organizations. The following sections list these entities.

4.4.1 Federal Agencies

U.S. Department of Agriculture Farm Service Agency
U.S. Department of Agriculture Natural Resources Conservation Service
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Fish and Wildlife Service Ruby Lake National Wildlife Refuge

4.4.2 State Agencies

Nevada Bureau of Air Pollution Control
Nevada Department of Wildlife
Nevada Wildlife Commission
Nevada Division of Environmental Protection
Nevada Division of Lands
Nevada Natural Heritage Program
State Historic Preservation Office
Nevada Sagebrush Ecosystem Program

4.4.3 Local Agencies

Eureka County Board of Commissioners
Lander County
White Pine County

4.4.4 Tribal Organizations

Battle Mountain Band Council
Cedar City Band of Paiutes
Confederated Tribes of the Goshute Indian Reservation
Duckwater Shoshone Tribe of the Duckwater Reservation
Elko Band Council
Ely Shoshone Tribe of Nevada
Indian Peaks Band
Kaibab Band of Paiute Indians
Las Vegas Paiute Tribe of the Las Vegas Indian Colony
Lovelock Paiute Tribe
Moapa Band of Paiute Indians of the Moapa River Indian Reservation
Paiute Indian Tribe of Utah
Reno-Sparks Indian Colony
Skull Valley Band of Goshutes
South Fork Band Council
Te-Moak Tribe of the Western Shoshone Indians of Nevada
Wells Band Council
Winnemucca Indian Colony of Nevada
Yomba Shoshone Tribe of the Yomba Reservation

4.4.5 Private Organizations and Companies

Great Basin Resource Watch
Western Watersheds Project
Wild Horse Preservation Campaign

5.0 List of Preparers and Reviewers

As required by NEPA regulations (40 CFR 1502.17), **Table 5-1** lists the people responsible for preparing, reviewing and disseminating this Draft EIS. The BLM, as lead agency, provided overall guidance to ensure this EIS process is consistent with all applicable regulations and requirements. This guidance included final oversite and approval of the public involvement, alternatives development, and impacts analysis. The BLM has retained AECOM as a third-party consultant to work under BLM direction in the preparation of this EIS (**Table 5-2**). AECOM was selected by the lead agency to avoid any conflict of interest. AECOM has certified that it does not have any financial or other interest in the decisions to be made pursuant to this EIS. Barrick Gold US responsibility was limited to providing information on the details of the Proposed Action and alternatives and to review and ensure the technical and engineering accuracy of the alternative descriptions. Barrick Gold US also provided comments on other sections of the EIS for BLM consideration. The cooperating agencies listed below provided input on the alternatives, the affected environment, and the environmental consequences sections relevant to the resources for which they have management responsibility.

Table 5-1 List of Preparers and Technical Specialists

Specialist	Responsibility/Resource
BLM Ely District Office	
Miles Kreidler	Project Manager, Minerals, Geology
Jill Moore	Egan Field Manager
David Jones	Air Quality
Chris McVicars	Invasive, Non Native Species
Scott Standfill	Range, Vegetation, Soils, Wetlands
Tom Olsen	Hydrologist
Leslie Riley	Archaeologist
Ruth Thompson	Wild Horses
Maria Ryan	Range
Marian Lichtler	Wildlife (Wildlife-related Noise), Special Status Species
Emily Simpson	Wilderness/Character
Erin Rajala	Visual/Recreation
Stephanie Trujillo	Lands and Realty
Randy Johnson	Wastes, Hazardous and Solid
Elvis Wall	Tribal Coordination
Mindy Seal	NEPA, Environmental Justice and Social Economics, Assistant Field Manager
Chris Mayer	Range, Assistant Field Manager
Cody Coombs	Fuels, Forest Resources
Chris Hanefeld	Public Affairs

Table 5-1 List of Preparers and Technical Specialists

Barrick Gold US (Proponent)	
Beth Ericksen	Regional Permitting Specialist
Joshua Roderick	Environment Superintendent
Steve Schoen	Permitting Manager
Melissa Barbanell	Senior Counsel
Jim Butler	Attorney at Law
Curtis Cadwell	Mine General Manager
U. S. Fish and Wildlife Service (Cooperating Agency)	
Peter Schmidt	Refuge Supervisor – Region 8
Nevada Department of Wildlife (Cooperating Agency)	
Steve Foree	Supervisory Habitat Biologist
Lindsey Lesmeister	Eastern Region Mining Biologist
Caleb McAdoo	Game Biologist
Cody Schroeder	Big Game Biologist
White Pine County, NV (Cooperating Agency)	
Richard Howe	Commissioner
Eureka County, NV (Cooperating Agency)	
Jake Tibbitts	Natural Resources Manager
Dale Bugenig	Hydrogeologist
Nevada Sagebrush Ecosystem Program (Cooperating Agency)	
Kacey KC	Program Manager

Table 5-2 AECOM (Third-party Contractor)

AECOM Team Member	Responsibility/Resource	Degree/Certification	Experience (years)
Matt Petersen	Project Manager, Senior NEPA Review, Cumulative Impacts	M.S. Aquatic Ecology B.S. Fisheries	20
Scott Duncan	Assistant Project Manager; Senior NEPA Review	M.S. and BA, Biology	29
Janet Guinn	Project Coordinator, Cultural Resources, Chapter 6, Cumulative Impacts	B.S. Psychology/Anthropology	12
Andrew Newman	ID Team Lead Wildlife/fisheries Resources and Special Status Wildlife, Vegetation, Wetlands and Riparian Zones, Noxious Weeds and Invasive Species, and Special Status Plants	M.S. Natural Resource Management B.S. Conservation Biology	12
Erin Bergquist	Vegetation, Wetlands and Riparian Zones, Noxious Weeds and Invasive Species, and Special Status Plants	M.S. Ecology B.S. Rangeland Ecosystem Science B.S. Soil and Crop Science B.S. Environmental Studies and Economics	9
Eric Schmude	Vegetation, Wetlands and Riparian Zones, Noxious Weeds and Invasive Species, and Special Status Plants	B.S. Wildlife and Fisheries Science B.A. American Studies	10
Mark Hodges	Air Quality	M.S. Environmental Engineering (Air Pollution Measurement and Control) B.S. Biological Sciences	36
Patrick Plumley	Geology & Minerals, Groundwater and Surface Water	M.S. Geology B.S. Geology	25
Bob Berry	Hydrogeology, Geochemistry	PhD, Geology / Geochemistry Prof Degree, Hydrogeology B.S. Geology	36
Bill Berg	Paleontological, Hazardous Materials and Solid Waste	M.S. Geology B.S. Geology	33
Terra Mascarenas	Soils, Watershed, Reclamation	B.S. Soil and Crop Science, Concentration in Environmental Science Certificate of Technology	16
Chris Dunne	Range, Wildlife Horses	B.S. Natural Resources Management	7
Kim Munson	Cultural Resources and Native American Traditional Values	M.A. Anthropology B.A. Anthropology	29
Denise Jurich	Cultural Resources and Native American Traditional Values	M.A. Anthropology, California State University, 2005 B.A. Anthropology, California State University, 1997	18

Table 5-2 AECOM (Third-party Contractor)

AECOM Team Member	Responsibility/Resource	Degree/Certification	Experience (years)
Merlyn Paulson	Visual Resources	M.L.A. Landscape Architecture B.L.A. Landscape Architecture and Environmental Planning	41
Steve Graber	Land Use and Access, Noise, and Recreation	B.S. Natural Resources Management B.A. Economics	8
Bernie Strom	Social and Economic Values and Environmental Justice	MCRP, City and Regional Planning B.S. Urban Planning	34
Scott Mackinnon	Geographic Information Systems (GIS)	B.S. Physical Geography	11
Brent Read	Geographic Information Systems (GIS)	M.S. Watershed Science, Colorado State University B.S. Forestry, Concentration in Forest Fire Science, Colorado State University Minor, Spatial Information Management Systems, Colorado State University	13
Brian Taylor	Geographic Information Systems (GIS)	B.A. Geography, Emphasis in GIS	7
Sue Coughenour	Document Production	General Education Studies	29

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7.0 Glossary and Index

Glossary

Acid Drainage: Water from pits, underground workings, and waste rock containing free sulfuric acid. The formation of acid drainage is primarily due to the weathering of iron pyrite and other sulfur-containing minerals. Acid drainage can mobilize and transport heavy metals which are often characteristic of metal deposits.

Acid Rock Drainage (ARD): Drainage that occurs as a result of natural oxidation of sulfide minerals contained in rock that is exposed to air and water. It is not confined to mining activities, but can occur wherever sulfide-bearing rock is exposed to air and water.

Acre: A unit of land measure equal to 43,560 square feet.

Acre-foot: The amount of water or sediment volume which covers 1 acre of land to a depth of 1 foot; 1 acre-foot is equal to 325,851 gallons or 43,560 cubic feet.

Affecting: Will or may have an effect on.

Allotment:. A unit of land suitable and available for livestock grazing that is managed as one grazing unit.

Alluvium: A general term for clay, silt, sand, gravel, or similar unconsolidated detrital material, deposited during comparatively recent geologic time by a stream or other body of running water.

Alluvial Fan: A low, outspread, gently sloping mass of loose rock material, shaped in plain view like an open fan or a segment of a cone; deposited by a stream at the place where it issues from a narrow mountain valley upon a plain or broad valley, or where a tributary stream is near or at its junction with the main stream, or wherever a constriction in a valley abruptly ceases or the gradient of the stream suddenly decreases.

Animal Unit Month (AUM): The amount of forage required by one cow and calf, or their equivalent, for one month.

Aquifer: A zone, stratum, or group of strata acting as a hydraulic unit that stores or transmits water in sufficient quantities for beneficial use.

Bedrock: Solid rock exposed at the surface of the earth or overlain by unconsolidated material, weathered rock, or soil.

Borehole: A hole with a drill, auger, or other tools for exploring strata in search of minerals, for water supply, for blasting purposes, for proving the position of old workings and faults, and for releasing accumulations of gas or water.

Cooperating Agency: Any federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment. The selection and responsibilities of a cooperating agency are described in

Section 1501.6. A State or local agency of similar qualifications or, when the effects are on a reservation, an Indian Tribe, may by agreement with the lead agency become a cooperating agency.

Cultural Resources: Archaeological sites, architectural structures or features, traditional use areas, and Native American sacred sites or special use areas.

Cumulative Impact: The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Deposit: A natural accumulation, such as precious metals, minerals, coal, gas, oil, etc., that may be pursued for its intrinsic value; gold deposit.

Designated Basin: Groundwater basin where permitted ground water rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration.

Dewatering: The lowering of the water level in a well as a result of withdrawal; the reduction in groundwater level at a point caused by the withdrawal of water from an aquifer.

Doré: Metal alloy composed of gold, silver, and other precious metals. Bullion containing unseparated metallic gold and silver.

Downgradient: In relation to any fixed point with regard to the direction of drainage or flow, downgradient is at a lower point of elevation than the chosen observation point and thus downward in relation to the direction of flow.

Drawdown: Vertical distance that a water elevation is lowered or the pressure head is reduced due to the removal of water from the same system.

Drill Pad: An earthen platform/bench created to provide stable support for a drill rig during drilling activities.

Effects include:

(a) Direct effects, which are caused by the action and occur at the same time and place.

(b) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects also may include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

Environmental Document: Includes the documents specified in the national environmental policy act, Section 1508.9 (environmental assessment), Section 1508.11 (environmental impact statement), Section 1508.13 (finding of no significant impact), and Section 1508.22 (notice of intent). “Environmental impact statement” means a detailed written statement as required by Section 102(2)(C) of the Act.

Ephemeral Drainage: A channel or drainage that flows only in direct response to precipitation or snow melt. Such flow is usually of short duration.

Erosion: The wearing away of the land surface by running water, wind, ice or other geologic agents, including such processes as gravitation creep.

Exploration: The search for economic deposits of minerals, ore, gas, oil, or coal through the practices of geology, geochemistry, geophysics, drilling, shaft sinking and/or mapping.

Extraction: The process of mining and removal of coal or ore from a mine. Also used in relation to all process of obtaining metals from ores.

Feasible: Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Federal Agency: All agencies of the Federal Government. It does not mean the Congress, the Judiciary, or the President, including the performance of staff functions for the President in his Executive Office. For the purposes of regulation it includes States and units of general local government and Indian tribes assuming NEPA responsibilities under section 104(h) of the Housing and Community Development Act of 1974.

Forage: All browse and non-woody plants that are available to livestock or game animals for grazing or harvestable for feed.

Fugitive Dust: Dust particles suspended randomly in the air from road travel, excavation and rock loading operations.

Geochemistry: The study of the distribution and amounts of the chemical elements in minerals, ores, rocks, soils, water, and the atmosphere, and their circulation in nature, on the basis of the properties of their atoms and ions. The geology in chemistry concerned with the chemical composition of, a chemical reactions taking place within, the earth's crust.

Geotechnical: A branch of engineering that is essentially concerns with the engineering design aspects of slope stability, settlement, earth pressures, bearing capacity, seepage control, and erosion.

Groundwater: Water found beneath the land surface in the zone of saturation below the water table.

Growth Media: All materials, including topsoil, specified soil horizons, vegetative debris, and organic matter, which are classified as suitable for stockpiling and/or reclamation.

Haul Road: A road used by large (<50-ton capacity) trucks to haul ore and waste rock from an open pit mine to other locations.

Heap Leaching: The process of recovering gold and other metals from low-grade ores by leaching ore that has been mined and placed on a specially prepared pad. A chemical solution is applied through low volume emitters, and the metal bearing leachate solution percolates and is collected.

Heavy Metals: A group of elements, usually acquired by organisms in trace amounts, that are often toxic in higher concentrations; includes lead, mercury, molybdenum, nickel, copper, cobalt, chromium, iron, silver, etc.

HDPE (High Density Polyethylene): A plastic impermeable material used for liners. This material deforms with a low probability of puncturing or splitting. Seams are heat welded instead of glued, thus preventing rupture.

Human Environment: Shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (Section 1508.8.) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.

Hydrographic Basin: An extent or an area of land where surface water from rain and melting snow or ice converges to a single point, in the basin, where the waters join another waterbody, such as a river, lake, reservoir, estuary, wetland, sea, or ocean.

Hydraulic Conductivity: The capacity of a rock to transmit water. It is expressed as the volume of water at the existing kinematic viscosity that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow.

Irreversible and Irretrievable Commitments of Resources: Irreversible commitments of resources occurs when, once committed to the proposed project components, the resource would continue to be committed throughout the life of the proposed project. An irretrievable commitment of the resources refers to those resources that, once used, consumed, destroyed or degraded during construction, operations, or decommissioning of the proposed project components, would cause the resource to be unavailable for use by future generations.

Key Observation Point (KOP): A specific place on a travel route or within an existing or potential use area where the view of a management activity or project would be most revealing for purposes of the contrast rating.

Lead Agency: The agency or agencies preparing or having taken primary responsibility for preparing the environmental impact statement.

Leaching: The process of applying a chemical agent that bonds preferentially and dissolves into solution the target metal (s) in an ore. The metal complexes or binds to the solution, which is then called a "pregnant" solution. The pregnant solution is collected for processing to recover the metals.

Locatable Minerals: Generally refers to hardrock minerals on Public Domain lands or National Forest System lands reserved from the Public Domain that are mined and processed to recover metals, such as gold and copper, chemical grade limestone, and asbestos.

Milling: The general process of treating or to separate and concentrate the valuable metal(s) or mineral(s) from the rest of the ore material.

Mine Pit: Surface area from which ore and waste rock are removed.

Mineral Entry: The filing of a mining claim upon Public Domain or related land to obtain the right to any minerals it may contain. Valid mining claims may be purchased in full (patented) under the 1872 mining law, as amended.

Mining Claim: A portion of the Public Domain or related lands which a miner, for mining purposes, takes and holds in accordance with mining laws.

Mitigation includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

Monitor: To systematically and repeatably watch, observe, or measure environmental conditions in order to track changes.

NEPA Process: All measures necessary for compliance with the requirements of section 2 and Title I of the National Environmental Policy Act (NEPA).

Notice of Intent: A notice that an environmental impact statement will be prepared and considered. The notice shall briefly:

(a) Describe the proposed action and possible alternatives.

(b) Describe the agency's proposed scoping process including whether, when, and where any scoping meeting will be held.

(c) State the name and address of a person within the agency who can answer questions about the proposed action and the environmental impact statement.

“Proposal” exists at that stage in the development of an action when an agency subject to the Act has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated. Preparation of an environmental impact statement on a proposal should be timed (Section 1502.5) so that the final statement may be completed in time for the statement to be included in any recommendation or report on the proposal. A proposal may exist in fact as well as by agency declaration that one exists.

Open Pit Mining: A type of mining that involves excavation of ore by digging downward from the ground surface, removing the overburden and extracting the ore beneath. The result of the mining operation is an “open pit.”

Ore: An earth material containing target metal(s) or mineral(s) in sufficient concentration and quantity which may be mined and processed at an economic profit.

Patented Claims: Private land which has been secured from the U.S. Government by compliance with the laws relating to such lands.

Permeability: see hydraulic conductivity.

pH: Symbol for the negative common logarithm of the hydrogen ion concentration (acidity) of a solution. The pH value of 7 is considered neutral. A pH value below 7 indicates acidity, and a pH value above 7 indicates alkalinity or a base.

Philopatric: Tending to return to or remain near a particular site or area.

Plan of Operations: A detailed description presenting the methods, timing, and contingencies to be used during the operation of the Project. A document required from any person proposing to conduct mineral related activities which utilize earth moving equipment and which will cause disturbance to surface resources.

Precious Metal: Any of the less common and highly valuable metals; gold, silver, platinum.

Pregnant Solution: The resulting metal-laden solution collected from the leaching of ore which contains dissolved metal values. The precious metals values are recovered from this pregnant solution, which then becomes the barren solution that is typically refortified with necessary reagents and reintroduced into the leaching circuit.

Reclamation: Returning disturbed land to a form and productivity in conformity with a predetermined land management plan or a government approved plan or permit.

Record of Decision: A document separate from but associated with an Environmental Impact Statement which states the decision; identifies all alternatives, specifying which were environmentally preferable; and states whether all practicable means to avoid environmental harm from the alternative have been adopted, and if not, why not (40 CFR 1505.2).

Relationships Between Short-term Use and Long-term Productivity: Those relationships which tie short-term use to the long-term condition and viability of a given resource value (an example would be the long-term effects of overgrazing on range productivity and condition).

Right-of-Way: Strip of land or corridor over which a power line, pipeline, access road, or maintenance road would pass.

Riparian: Pertaining to or situated on the bank of a body of water, especially of a watercourse such as a river.

Rock Disposal Area (RDA): also called waste rock disposal facility or stockpile area; an area where waste rock (loose or consolidated rock material that overlies a mineral deposit) is placed during mining either temporarily or permanently.

Scope: Consists of the range of actions, alternatives, and impacts to be considered in an environmental impact statement. The scope of an individual statement may depend on its relationships to other statements (Sections1502.20 and 1508.28). To determine the scope of environmental impact statements, agencies shall consider three types of actions, three types of alternatives, and three types of impacts. They include:

(a) Actions (other than unconnected single actions) which may be:

Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:

(i) Automatically trigger other actions which may require environmental impact statements. (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
(ii) Are interdependent parts of a larger action and depend on the larger action for their Justification.

Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.

Similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement.

(b) Alternatives, which include: No Action Alternative.

Other reasonable courses of actions.

Mitigation measures (not in the Proposed Action).

(c) Impacts, which may be: 1) direct; 2) indirect; 3) cumulative.

Significantly: As used in NEPA requires considerations of both context and intensity:

(a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

2) The degree to which the proposed action affects public health or safety.

3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

4) The degree to which the effects on the quality of the human environment are likely to be controversial.

5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

Stockpile: An accumulation of ore, stone, or other mined or quarried material.

Surface Water: Water found in ponds, lakes, inland seas, streams, and rivers or above the ground surface.

Third-party Contractor: An independent firm contracted by a government agency to perform work related to a proposed action or another organization; due to the financial and contractual arrangements governing such relationships, the third-party contractor has no financial or other interest in the decision to be reached on the project.

Transmissivity: The rate at which water of the prevailing kinematic viscosity is transmitted through a unit width of an aquifer under a unit hydraulic gradient. It equals the hydraulic conductivity multiplied by the aquifer thickness.

Undesignated Basin: Groundwater basin where permitted groundwater rights are less than the estimated average annual recharge.

Upgradient: In relation to any fixed point with regard to the direction of drainage or flow, upgradient is at a higher point of elevation than the chosen observation point and thus upward in relation to the direction of flow.

Waste Rock: A non-ore rock that is removed to access the ore zone. It contains target metal(s) or mineral(s) below the economic cutoff level, and must be removed to gain access to the ore zone.

Watershed: The entire land area that contributes water to a particular drainage system or stream.

Wilderness Areas: Wilderness areas are designated by Congress under the authority of the Wilderness Act of 1964 and comprise the National Wilderness Preservation System.

Index

Access	ES-1-ES-6, ES-14, ES-15, ES-18-ES-20; 1-3, 1-5, 1-6; 2-2, 2-4, 2-12, 2-19-2-24, 2-33, 2-35, 2-38-2-42, 2-44, 2-46, 2-47, 2-50, 2-55, 2-56, 2-59, 2-62-2-64, 2-66-2-69, 2-71-2-73, 2-75-2-77, 2-80, 2-86, 2-88, 2-90-2-92, 2-95, 2-96, 2-98, 2-101-2-103, 2-105, 2-108-2-110, 2-113, 2-115, 2-119, 2-122, 2-127, 2-128, 2-134-2-137, 2-140, 2-142, 2-146, 2-149-2-151, 2-153, 2-157, 2-158, 2-162, 2-165, 2-168, 2-173, 2-175, 2-176, 2-177, 2-179, 2-182, 2-183, 2-187, 2-190, 2-192, 2-194, 2-197, 2-199-2-201, 2-204-2-207, 2-209, 2-211, 2-212, 2-214-2-219, 2-225, 2-226, 2-229, 2-233, 2-249; 3.2-8, 3.2-10, 3.2-12, 3.5-7, 3.6-4, 3.7-3, 3.7-23, 3.7-30, 3.8-20, 3.8-22, 3.8-33, 3.9-6-3.9-8, 3.10-3, 3.10-4, 3.11-3, 3.11-6, 3.12-9, 3.12-15, 3.13-1, 3.13-2, 3.13-6, 3.15-1, 3.15-2, 3.15-4-3.15-9, 3.16-1, 3.16-4-3.16-7, 3.17-3, 3.17-10, 3.18-1, 3.19-10, 3.20-1, 3.20-8, 3.22-6
Access Roads	ES-3-ES-5, ES-20; 1-5; 2-12, 2-19, 2-20-2-23, 2-33, 2-35, 2-39, 2-40, 2-46, 2-47, 2-55, 2-56, 2-62, 2-63, 2-66, 2-67, 2-71, 2-72, 2-75, 2-76, 2-80, 2-90, 2-101, 2-102, 2-108, 2-109, 2-127, 2-134, 2-136, 2-137, 2-149, 2-153, 2-157, 2-158, 2-162, 2-165, 2-168, 2-173, 2-175, 2-176, 2-177, 2-179, 2-182, 2-183, 2-187, 2-190, 2-194, 2-197, 2-200, 2-204-2-207, 2-209, 2-211, 2-212, 2-214, 2-215; 3.5-7, 3.15-1, 3.16-5, 3.20-1, 3.20-8
Affected Environment	ES-1, ES-5; 2-234; 3.1-1, 3.2-1, 3.3-1, 3.4-1, 3.5-1, 3.6-1, 3.7-1, 3.8-1, 3.9-1, 3.10-1, 3.11-1, 3.12-1, 3.13-1, 3.14-1, 3.15-1, 3.16-1, 3.17-1, 3.18-1, 3.19-1, 3.19-11, 3.20-1
Air Quality	ES-17, ES-18, ES-22; 1-6; 2-126, 2-216, 2-217, 2-219, 2-221-2-223, 2-225-2-229, 2-231-2-234, 2-247; 3.1-1-3.1-3, 3.3-2, 3.14-1-3.14-4, 3.14-6, 3.14-8-3.14-10, 3.14-12-3.14-15, 3.18-4, 3.19-1, 3.22-6; 4-3
Alligator Ridge Mine	ES-1, ES-2; 1-1; 2-1, 2-2, 2-4, 2-5, 2-15, 2-21-2-23, 2-95, 2-98, 2-105, 2-221; 3.2-1, 3.20-8
Alternatives Considered but Eliminated	1-7; 2-215
Ancillary and Support Facilities	ES-1, ES-2, ES-6, ES-14; 2-2, 2-4, 2-19-2-23, 2-38, 2-40, 2-47, 2-56, 2-63, 2-67, 2-72, 2-76, 2-80, 2-103, 2-109, 2-166, 2-169, 2-174, 2-175, 2-202, 2-205, 2-229; 3.2-8, 3.2-11, 3.10-1, 3.10-4
Casino Area	2-32, 2-73-2-77, 2-176, 2-206, 2-216;
Casino/Winrock Mine	ES-1; 2-1-2-3, 2-13, 2-17, 2-20, 2-21, 2-24; 3.2-1, 3.20-8
Comparative Analysis of Alternatives	2-1, 2-234;
Cultural Resources	ES-15-ES-17; 2-90, 2-115, 2-126, 2-219, 2-226, 2-231, 2-233, 2-246; 3.12-1, 3.12-2, 3.12-8-3.12-15, 3.13-2-3.13-4, 3.18-4, 3.22-1; 4-2
Cumulative Impacts	1-3, 1-8; 2-219, 2-220; 3.2-12, 3.3-63, 3.3-65, 3.4-10, 3.4-11, 3.5-12-3.5-14, 3.6-6, 3.6-7, 3.7-37, 3.7-38, 3.8-34-3.8-36, 3.9-10, 3.9-11, 3.10-5, 3.11-6, 3.11-7, 3.12-14, 3.13-6, 3.14-13, 3.14-14, 3.15-8, 3.16-6, 3.16-7, 3.17-29, 3.18-5, 3.19-15, 3.20-8, 3.23-3
Dewatering	2-42, 2-43, 2-49, 2-50, 2-58, 2-64, 2-69, 2-73, 2-77, 2-82, 2-104, 2-111, 2-150, 2-166, 2-169, 2-174-2-176, 2-182, 2-184, 2-192, 2-198, 2-201, 2-205, 2-206, 2-211, 2-212, 2-236; 3.3-32, 3.3-37, 3.3-39, 3.3-51, 3.3-52, 3.3-56, 3.3-59, 3.13-6, 3.17-7, 3.22-2; 4-2

Drilling and Blasting	2-83, 2-111;
Emergency Response	ES-23; 2-94, 2-95, 2-114, 2-128, 2-253; 3.7-31, 3.17-9, 3.17-12, 3.20-3, 3.20-4, 3.20-7-3.20-9
Environmental Consequences	ES-1, ES-5; 2-234; 3.1-1, 3.2-8, 3.3-32, 3.4-6, 3.5-7, 3.6-3, 3.7-22, 3.7-37, 3.8-17, 3.9-4, 3.10-1, 3.11-5, 3.12-9, 3.13-3, 3.13-4, 3.14-6, 3.14-8, 3.15-5, 3.16-4, 3.17-16, 3.18-2, 3.19-10, 3.20-4; 4-3
Environmental Justice	ES-22; 2-219-2-223, 2-225, 2-226, 2-228-2-230, 2-233, 2-252; 3.1-2, 3.17-2, 3.18-1-3.18-5, 3.22-7; 4-3
Environmental Protection Measures	ES-7, ES-8, ES-9, ES-13, ES-14, ES-16, ES-17, ES-23; 1-7; 2-115, 2-116, 2-240; 3.1-1, 3.3-54, 3.3-59, 3.4-6, 3.5-8, 3.6-4, 3.7-30, 3.8-25, 3.12-12, 3.13-4, 3.15-7, 3.16-5, 3.16-6, 3.19-14
Existing Facilities	ES-23; 1-3, 1-7; 2-1, 2-24, 2-218; 3.19-11
Exploration	ES-1, ES-2, ES-3, ES-4, ES-5, ES-10, ES-18; 1-3, 1-5; 2-1-2-6, 2-14, 2-16, 2-20-2-24, 2-33, 2-35, 2-36, 2-54, 2-88, 2-90, 2-91, 2-96, 2-97, 2-103, 2-110, 2-112, 2-113, 2-116, 2-118, 2-132-2-134, 2-136, 2-137, 2-149, 2-150, 2-157, 2-158, 2-162, 2-177, 2-179, 2-187, 2-190, 2-194, 2-207, 2-209, 2-214-2-216, 2-219-2-223, 2-225, 2-228, 2-229, 2-231; 3.2-1, 3.2-12, 3.3-12, 3.3-20, 3.3-63, 3.3-45, 3.4-10, 3.5-13, 3.6-6, 3.7-15, 3.7-18, 3.7-22, 3.7-25, 3.7-26, 3.7-32-3.7-34, 3.7-37, 3.7-38, 3.8-17, 3.8-19, 3.8-20, 3.8-22, 3.8-24, 3.8-25, 3.8-28, 3.8-31, 3.8-34, 3.8-35, 3.9-5, 3.9-7, 3.9-9, 3.10-3, 3.11-1, 3.11-6, 3.12-5, 3.12-8, 3.12-14, 3.14-13, 3.15-5, 3.15-8, 3.16-6, 3.19-15, 3.20-1, 3.20-8
Fire Protection	3.17-9, 3.17-14, 3.20-7
Fisheries	ES-9, ES-10, ES-12, ES-21; 2-240; 3.3-52, 3.7-1, 3.7-21, 3.8-17, 3.8-26, 3.8-27, 3.8-30, 3.8-33, 3.8-36, 3.16-6, 3.17-22, 3.17-27, 3.22-3
Geochemistry	2-84, 2-116, 2-200; 3.3-21, 3.3-50, 3.3-21, 3.3-23, 3.3-45, 3.3-51, 3.3-65
Geology and Minerals	ES-5; 2-116, 2-219, 2-226, 2-233, 2-235; 3.2-12, 3.22-2
Greater Sage-grouse	2-159, 2-192, 2-219, 2-221-2-223, 2-225-2-234; 3.8-2, 3.8-10-3.8-13, 3.8-20, 3.8-22-3.8-24, 3.8-27, 3.8-31, 3.8-33, 3.8-36
Groundwater	ES-6, ES-7, ES-8, ES-9, ES-13, ES-14, ES-15, ES-17; 1-6; 2-42, 2-43, 2-48-2-50, 2-57, 2-58, 2-63, 2-64, 2-68, 2-69, 2-72, 2-73, 2-76, 2-77, 2-81, 2-82, 2-84, 2-90, 2-104, 2-110, 2-111, 2-116-2-119, 2-146, 2-149, 2-152, 2-216-2-218, 2-236, 2-239, 2-240, 2-243-2-245, 2-247; 3.2-9, 3.2-10, 3.3-1, 3.3-5, 3.3-7, 3.3-10, 3.3-12-3.3-17, 3.3-19, 3.3-21, 3.3-22, 3.3-32-3.3-39, 3.3-41, 3.3-42, 3.3-44, 3.3-51, 3.3-52, 3.3-54, 3.3-56, 3.3-59, 3.3-60, 3.3-63-3.3-68, 3.5-8-3.5-12, 3.5-14, 3.7-23, 3.7-25, 3.7-30, 3.7-31, 3.7-33-3.7-35, 3.7-37, 3.7-38, 3.8-25, 3.8-26, 3.8-30, 3.8-33, 3.8-36, 3.9-6, 3.9-8-3.9-11, 3.10-3-3.10-5, 3.13-3-3.13-6, 3.17-7, 3.22-2, 3.22-6; 4-1-4-3
Growth Media	ES-1, ES-7-ES-9; 2-2, 2-40, 2-47, 2-56, 2-63, 2-67, 2-72, 2-76, 2-80, 2-81, 2-83, 2-84, 2-103, 2-109, 2-120, 2-122, 2-132, 2-135, 2-140-2-143, 2-146-2-150, 2-170, 2-188, 2-201-2-203, 2-237; 3.3-44, 3.3-51, 3.4-5-3.4-7, 3.4-9, 3.4-10, 3.6-4, 3.22-2

Haul Roads	ES-1-ES-7, ES-10, ES-19; 2-2, 2-4, 2-12-2-16, 2-19-2-23, 2-33, 2-35, 2-39, 2-46-2-48, 2-55-2-57, 2-59, 2-62, 2-66, 2-67, 2-71, 2-75, 2-76, 2-80, 2-95, 2-101, 2-102, 2-108, 2-126, 2-136, 2-137, 2-149, 2-150, 2-157, 2-158, 2-162, 2-165, 2-168, 2-173, 2-175, 2-176, 2-177, 2-179, 2-182, 2-183, 2-187, 2-190, 2-191, 2-194, 2-197, 2-200, 2-204-2-207, 2-209, 2-211, 2-212, 2-214, 2-215, 2-218, 2-228, 2-229, 2-248; 3.2-8, 3.2-11, 3.6-4, 3.7-25, 3.7-26, 3.7-32-3.7-34, 3.7-40, 3.15-7, 3.16-6, 3.17-28, 3.17-29
Hazardous Materials and Solid Waste	ES-23; 2-94, 2-128, 2-222, 2-229, 2-253; 3.7-23, 3.7-30, 3.9-6, 3.9-8, 3.10-3, 3.10-4, 3.20-1, 3.20-2, 3.20-4, 3.20-7, 3.20-8, 3.22-7
Heap Leach Facilities	ES-1, ES-3, ES-4, ES-5; 2-1, 2-2, 2-12-2-16, 2-19-2-23, 2-29-2-32, 2-34, 2-35, 2-84, 2-147, 2-156-2-158, 2-160, 2-162, 2-177-2-179, 2-187, 2-190, 2-193, 2-194, 2-207-2-209, 2-214, 2-215; 3.3-32, 3.3-54
Infrastructure	ES-21; 1-3, 1-5; 2-44, 2-49, 2-50, 2-57, 2-59, 2-64, 2-68, 2-69, 2-73, 2-77, 2-81, 2-98, 2-105, 2-182, 2-211; 3.8-23, 3.9-5, 3.17-16, 3.17-29, 3.17-31; 4-2
Interpit Areas	ES-1-ES-5, ES-10; 2-2, 2-4, 2-12-2-14, 2-19-2-23, 2-33, 3-35, 2-39, 2-46, 2-47, 2-55, 2-62, 2-66, 2-71, 2-75, 2-80, 2-101, 2-108, 2-132, 2-140, 2-142, 2-157, 2-158, 2-165, 2-166, 2-168, 2-169, 2-173-2-177, 2-182, 2-183, 2-187, 2-190, 2-197, 2-200, 2-201, 2-204-2-207, 2-211, 2-212, 2-214, 2-215; 3.7-6, 3.7-26
Invasive and Non Native Species	ES-7; 3.4-8
Irreversible and Irretrievable	1-8; 3.22-1, 3.22-2, 3.22-6, 3.22-7
Land Use	ES-7, ES-18, ES-19; 1-3, 1-5; 2-120, 2-123, 2-128, 2-133, 2-143, 2-146, 2-150, 2-151, 2-217-2-219, 2-221, 2-225-2-227, 2-232, 2-233, 2-248; 3.1-5, 3.4-6, 3.4-8, 3.4-9, 3.5-14, 3.7-23, 3.7-28, 3.9-11, 3.13-1, 3.13-6, 3.15-1-3.15-3, 3.15-5-3.15-9, 3.17-31, 3.19-1, 3.19-3, 3.19-8, 3.20-8, 3.22-6, 3.23-2
List of Preparers and Reviewers	ES-1
Little Bald Mountain Area	2-31, 2-64, 2-65, 2-66, 2-175, 2-206
Mining Operations	ES-11, ES-12, ES-14, ES-23; 1-4; 2-1, 2-2, 2-4, 2-17, 2-36, 2-40, 2-58, 2-68, 2-83, 2-96, 2-120, 2-131, 2-134, 2-146, 2-159, 2-177, 2-187, 2-190, 2-192, 2-207, 2-217, 2-220; 3.3-12, 3.4-7, 3.7-22, 3.7-24, 3.7-27, 3.7-30, 3.7-35, 3.7-41, 3.9-6, 3.10-3, 3.11-6, 3.12-7, 3.13-3, 3.13-5, 3.15-3, 3.19-11, 3.20-1, 3.20-3, 3.21-1; 4-3
Monitoring and Mitigation	1-8; 2-234; 3.1-1, 3.2-13, 3.3-66, 3.4-11, 3.5-14, 3.6-8, 3.7-39, 3.8-36, 3.9-11, 3.10-6, 3.11-7, 3.12-15, 3.13-6, 3.14-15, 3.15-9, 3.16-7, 3.17-31, 3.18-5, 3.19-16, 3.20-9, 3.23-3
Mule Deer Design Features	ES-10, ES-11; 2-131, 2-158, 2-192, 2-215, 2-241; 3.7-26, 3.7-33, 3.7-35, 3.7-37, 3.7-42, 3.16-5
Mule Deer Migration Corridor	ES-10, ES-11; 2-39, 2-40, 2-42, 2-46, 2-131-2-133, 2-158, 2-159, 2-161, 2-165-2-170, 2-173, 2-190, 2-191, 2-196, 2-199-2-204, 2-216, 2-217, 2-241, 2-249, 2-251; 3.7-3, 3.7-25, 3.7-26, 3.7-31-3.7-35, 3.7-37, 3.7-39, 3.7-31, 3.7-32, 3.7-34, 3.16-6
Native American Consultation	3.13-2,
Native American Traditional Values	ES-17; 2-219, 2-226, 2-231, 2-233, 2-247; 3.3-52, 3.12-2, 3.13-1, 3.18-4, 3.22-5

No Action Alternative	ES-5; 1-7; 2-1, 2-2, 2-6-2-11, 2-15, 2-17-2-24, 2-68, 2-96, 2-197, 2-234; 3.2-8, 3.2-12, 3.3-32, 3.3-35, 3.3-37, 3.3-60, 3.4-6, 3.4-10, 3.5-7, 3.5-12, 3.5-13, 3.6-3, 3.6-6, 3.6-7, 3.7-22, 3.7-37, 3.7-38, 3.8-17, 3.8-33, 3.9-4, 3.9-9, 3.9-10, 3.10-1, 3.10-5, 3.11-5-3.11-7, 3.12-9, 3.12-14, 3.13-4, 3.13-5, 3.14-8, 3.14-13, 3.14-14, 3.15-5, 3.15-6, 3.15-8, 3.16-4, 3.16-6, 3.16-7, 3.17-16, 3.17-29, 3.17-31, 3.18-2, 3.18-4, 3.19-10, 3.19-14, 3.19-15, 3.20-4, 3.20-7
Noise	ES-10; 2-192, 2-240, 2-243; 3.7-22, 3.7-24, 3.7-25, 3.7-33, 3.7-40, 3.8-14, 3.8-17-3.8-21, 3.8-23-3.8-26, 3.8-28-3.8-30, 3.8-32, 3.8-36, 3.8-37, 3.16-6; 4-2
North Operations Area	ES-1; 1-1; 2-1-2-4, 2-7, 2-9, 2-11, 2-17, 2-19, 2-20, 2-24-2-26, 2-29, 2-36, 2-38, 2-39, 2-44-2-46, 2-51, 2-52, 2-54, 2-55, 2-59-2-62, 2-65, 2-66, 2-70, 2-71, 2-74, 2-75, 2-78, 2-79, 2-83, 2-93, 2-135, 2-136, 2-138, 2-141, 2-154, 2-157, 2-160, 2-162, 2-163, 2-184, 2-188-2-190, 2-193, 2-194, 2-214, 2-217; 3.2-8, 3.2-9, 3.2-12, 3.4-2, 3.4-4, 3.4-11, 3.5-1, 3.5-8, 3.5-10, 3.5-11, 3.5-13, 3.6-7, 3.7-31, 3.7-37, 3.7-38, 3.8-12, 3.8-28, 3.8-31, 3.9-5, 3.9-7, 3.9-9, 3.9-10, 3.10-4, 3.10-5, 3.11-7, 3.12-13, 3.12-15, 3.14-14, 3.15-8, 3.16-6, 3.16-7, 3.17-25, 3.17-26, 3.19-14, 3.19-15, 3.20-5
Numbers Area	ES-11; 2-29, 2-38-2-40, 2-42, 2-47-2-49, 2-56-2-58, 2-62-2-64, 2-67-2-69, 2-72, 2-73, 2-76, 2-77, 2-80-2-82, 2-103, 2-104, 2-110, 2-111, 2-161, 2-165, 2-166, 2-196-2-198
Open Pits	ES-1, ES-2, ES-3, ES-4, ES-5, ES-6, ES-7, ES-8, ES-9, ES-13, ES-14, ES-18, ES-20, ES-22; 2-2, 2-4, 2-11, 2-13, 2-15-2-17, 2-20-2-24, 2-29-2-32, 2-34, 2-38, 2-43, 2-44, 2-46, 2-50, 2-59, 2-63, 2-65, 2-69, 2-73, 2-78, 2-82, 2-95, 2-98, 2-102, 2-105, 2-135, 2-146, 2-147, 2-156, 2-157, 2-161, 2-166, 2-169, 2-175-2-177, 2-181, 2-183, 2-187, 2-190, 2-196, 2-198, 2-202, 2-205-2-207, 2-210, 2-211, 2-213, 2-214, 2-218, 2-220, 2-229, 2-235, 2-238, 2-252; 3.2-1, 3.2-8-3.2-11, 3.2-13, 3.3-21, 3.3-44, 3.4-8, 3.4-10, 3.4-11, 3.5-7, 3.5-10, 3.5-11, 3.5-14, 3.5-15, 3.6-3, 3.6-4, 3.6-6, 3.7-6, 3.7-22, 3.7-40, 3.8-18, 3.8-27, 3.8-30, 3.8-38, 3.9-4, 3.9-6, 3.9-7, 3.9-11, 3.10-1, 3.10-4, 3.10-6, 3.12-7, 3.12-10, 3.13-4, 3.13-5, 3.14-8, 3.14-11, 3.15-6, 3.15-7, 3.16-5, 3.16-7, 3.16-8, 3.19-11, 3.19-16, 3.21-1, 3.22-7
Ore Process Areas	ES-1, ES-2; 2-2, 2-4, 2-12-2-16, 2-19-2-23, 2-29-2-32, 2-34, 2-35
Paleontological Resources	ES-15; 2-126, 2-245; 3.1-5, 3.11-1-3.11-3, 3.11-5-3.11-7, 3.12-14, 3.22-5
Past and Present Actions	ES-1; 1-3, 1-8; 2-1, 2-219, 2-220, 2-222, 2-226, 2-230, 2-233; 3.1-1, 3.2-12, 3.4-10, 3.5-13, 3.5-14, 3.6-6, 3.6-7, 3.9-10, 3.9-11, 3.10-5, 3.11-6, 3.11-7, 3.12-15, 3.13-6, 3.15-8, 3.15-9, 3.16-7, 3.19-15
Permits and Approvals	ES-5; 1-6, 1-7; 2-6; 3.2-12, 3.3-60, 3.4-10, 3.5-12, 3.6-6, 3.7-37, 3.8-33, 3.9-9, 3.10-5, 3.11-6, 3.12-14, 3.13-5, 3.14-13, 3.15-8, 3.16-6, 3.17-29, 3.18-4, 3.19-14, 3.20-7
Pit Lake	ES-6; 1-6; 2-44, 2-49, 2-50, 2-58, 2-104, 2-111, 2-216-2-218, 2-237; 3.2-11, 3.2-12, 3.3-32, 3.3-51, 3.3-54, 3.3-56, 3.3-59, 3.3-65, 3.3-67
Poker Flats, Duke, Top Pit Complex, East Sage, and South Water Canyon Areas	2-30, 2-49, 2-51, 2-52, 2-54, 2-55, 2-169, 2-202

Processing Facilities	2-19, 2-38, 2-46, 2-54, 2-61, 2-66, 2-71, 2-75, 2-80, 2-100, 2-107, 2-117, 2-150, 2-152, 2-165, 2-167, 2-173, 2-175, 2-176, 2-181, 2-183, 2-197, 2-200, 2-204-2-206, 2-210, 2-212, 2-218, 2-220, 2-229; 3.3-32, 3.14-3, 3.14-14
Proposed Action	ES-1-ES-24; 1-1, 1-3, 1-6-1-8; 2-1, 2-2, 2-4, 2-24-2-29, 2-33, 2-34, 2-36-2-38, 2-44, 2-49, 2-50, 2-58, 2-59, 2-64, 2-69, 2-73, 2-78, 2-83, 2-88, 2-95-2-98, 2-105, 2-113, 2-136-2-139, 2-153, 2-154, 2-156-2-159, 2-161, 2-165-2-170, 2-173-2-177, 2-181-2-184, 2-187, 2-188, 2-190, 2-192, 2-196-2-202, 2-204-2-207, 2-210-2-212, 2-216-2-219, 2-230, 2-234-2-253; 3.1-1, 3.2-8-3.2-13, 3.3-24, 3.3-32, 3.3-34, 3.3-35, 3.3-37, 3.3-39, 3.3-40-3.3-44, 3.3-50, 3.3-52, 3.3-54, 3.3-56, 3.3-59, 3.3-60, 3.3-63-3.3-68, 3.4-1, 3.4-6, 3.4-7, 3.4-9-3.4-11, 3.5-7-3.5-15, 3.6-3, 3.6-4, 3.6-6-3.6-8, 3.7-22, 3.7-23, 3.7-25-3.7-28, 3.7-30-3.7-35, 3.7-37-3.7-41, 3.8-17-3.8-20, 3.8-22, 3.8-23, 3.8-26-3.8-28, 3.8-30-3.8-33, 3.8-35, 3.8-36, 3.8-38, 3.9-4-3.9-6, 3.9-8-3.9-11, 3.10-1, 3.10-3-3.10-6, 3.11-5-3.11-7, 3.12-9-3.12-15, 3.13-2, 3.13-4-3.13-6, 3.14-8-3.14-13, 3.14-15, 3.15-5-3.15-9, 3.16-4, 3.16-5, 3.16-7, 3.16-8, 3.17-6, 3.17-16, 3.17-18, 3.17-20-3.17-25, 3.17-27-3.17-30, 3.17-31, 3.18-2-3.18-5, 3.19-10, 3.19-12-3.19-16, 3.20-4, 3.20-5, 3.20-7-3.20-9, 3.21-1, 3.22-1, 3.22-2, 3.22-5-3.22-7, 3.23-1-3.23-3; 4-1
Public Participation	1-6, 1-8; 4-1
Purpose of and Need for the Action	1-3
Range Resources	ES-14; 2-125, 2-219, 2-226, 2-231, 2-233; 3.9-1, 3.9-2, 3.9-4, 3.9-9-3.9-11
Reasonably Foreseeable Future Actions	ES-1; 1-3; 2-219, 2-224, 2-228; 3.2-12, 3.3-63, 3.4-10, 3.5-12, 3.6-6, 3.7-37, 3.8-34, 3.9-10, 3.10-5, 3.11-6, 3.12-14, 3.13-6, 3.14-13, 3.15-8, 3.16-6, 3.17-29, 3.18-5, 3.19-15, 3.20-8
Reconfiguration Alternative	ES-3-ES-24; 2-153, 2-154, 2-156-2-166, 2-168-2-181, 2-183, 2-210, 2-213, 2-214, 2-216, 2-218, 2-234-2-236, 2-238, 2-240, 2-242-2-251, 2-253; 3.1-1, 3.2-8, 3.2-9, 3.2-10, 3.2-11, 3.2-12, 3.2-13, 3.3-37, 3.3-52-3.3-56, 3.3-59, 3.3-63, 3.3-66, 3.3-68, 3.4-1, 3.4-6, 3.4-9-3.4-11, 3.5-7, 3.5-10, 3.5-11, 3.5-13-3.5-15, 3.6-3, 3.6-4, 3.6-6-3.6-8, 3.7-22, 3.7-31-3.7-35, 3.7-37-3.7-41, 3.8-17, 3.8-27-3.8-32, 3.8-35, 3.8-36, 3.8-38, 3.9-4, 3.9-7-3.9-11, 3.10-1, 3.10-4-3.10-6, 3.11-5, 3.11-6, 3.11-7, 3.12-9, 3.12-12-3.12-15, 3.13-4-3.13-6, 3.14-8, 3.14-12-3.14-14, 3.15-5, 3.15-7-3.15-9, 3.16-4-3.16-8, 3.17-16, 3.17-25-3.17-31, 3.18-2-3.18-5, 3.19-10, 3.19-14-3.19-16, 3.20-4, 3.20-7-3.20-9, 3.21-1, 3.22-1, 3.22-2, 3.23-2, 3.23-3
Recreation	ES-18-ES-20, ES-23; ES-19; 1-5; 2-117, 2-128, 2-133, 2-219, 2-226, 2-231, 2-233, 2-234, 2-248, 2-249; 3.1-5, 3.6-6, 3.7-38, 3.8-35, 3.15-3, 3.15-5-3.15-7, 3.16-1-3.16-8, 3.17-13, 3.17-14, 3.19-1, 3.19-10, 3.19-11, 3.19-15, 3.21-1, 3.22-6
Redbird and Rat Areas	2-29, 2-30, 2-43-2-46, 2-55-2-57, 2-62, 2-63, 2-66-2-68, 2-71, 2-72, 2-75, 2-76, 2-80, 2-81, 2-101-2-103, 2-108-2-110, 2-166, 2-168, 2-191, 2-198, 2-216
Residual Adverse Effects	3.19-16, 3.20-9
Rock Disposal Areas	ES-1, ES-3, ES-4, ES-5; 2-2, 2-11, 2-13, 2-15, 2-16, 2-19-2-23, 2-29-2-32, 2-34, 2-38, 2-45, 2-52, 2-60, 2-65, 2-70, 2-74, 2-79, 2-99, 2-106, 2-132, 2-147, 2-156, 2-157, 2-161, 2-167, 2-170, 2-175-2-177, 2-181, 2-183, 2-187, 2-190, 2-196, 2-199, 2-202, 2-205-2-207, 2-210, 2-212-2-214, 2-228; 3.3-29, 3.14-8

Royale Area	2-31, 2-32, 2-69-2-73, 2-176, 2-206; 3.8-28, 3.8-31, 3.12-11, 3.19-12, 3.19-13
Schedule and Work Force	2-17, 2-22, 2-36, 2-96, 2-159, 2-177, 2-192, 2-207, 2-210
Seeps and Springs	3.3-5, 3.5-14, 3.7-12, 3.7-23, 3.7-38, 3.8-3, 3.8-16, 3.8-26, 3.8-36, 3.9-6, 3.9-10, 3.19-1
Social and Economic Values	2-219-2-222, 2-226, 2-228-2-230, 2-233, 2-249; 3.1-1, 3.1-5, 3.16-5, 3.17-1, 3.17-2, 3.17-16, 3.17-29-3.17-31, 3.18-5, 3.22-7; 4-2
Soils	ES-7; 2-85, 2-113, 2-219, 2-120, 2-127, 2-221-2-223, 2-225-2-229, 2-231-2-234, 2-237; 3.1-1, 3.1-5, 3.2-10, 3.3-2, 3.4-1, 3.4-4-3.4-8, 3.4-10, 3.4-11, 3.5-4, 3.5-5, 3.5-6, 3.5-9, 3.8-7, 3.8-17, 3.14-3, 3.14-14, 3.19-16, 3.20-6, 3.22-2
South Operations Area	ES-1, ES-3-ES-5; 1-1; 2-1, 2-4, 2-5, 2-8, 2-10, 2-15, 2-18, 2-21, 2-27, 2-28, 2-34, 2-37, 2-41, 2-95, 2-97-2-101, 2-106-2-108, 2-111, 2-114, 2-115, 2-137, 2-139, 2-142, 2-153, 2-154, 2-156, 2-160, 2-162, 2-163, 2-164, 2-171, 2-172, 2-176-2-180, 2-184, 2-186, 2-187, 2-189, 2-193, 2-195, 2-207-2-209, 2-213, 2-216, 2-217; 3.1-1, 3.2-8, 3.2-9, 3.2-10, 3.2-11, 3.4-3, 3.4-4, 3.4-6, 3.4-9, 3.5-1, 3.5-8, 3.5-10, 3.5-11, 3.6-4, 3.7-31, 3.8-13, 3.8-27, 3.8-28, 3.8-31, 3.8-32, 3.9-5, 3.9-7-3.9-9, 3.10-3, 3.10-4, 3.11-6, 3.12-12-3.12-14, 3.13-4, 3.13-5, 3.14-12, 3.15-7, 3.16-5, 3.16-6, 3.17-25, 3.17-26, 3.17-28, 3.17-30, 3.18-4, 3.19-14, 3.20-6, 3.20-7; 4-2
Special Status Species	ES-12; 2-124, 2-125, 2-242; 3.1-5, 3.3-52, 3.7-12, 3.7-13, 3.7-21, 3.7-31, 3.8-1, 3.8-3, 3.8-10, 3.8-17, 3.8-26, 3.8-27, 3.8-30, 3.8-33-3.8-36, 3.8-38, 3.22-4; 4-2
Spill Prevention	2-94, 2-114, 2-128, 2-129
Stockpile	2-13, 2-140-2-142, 2-228
Surface Water	ES-7, ES-16; 1-6; 2-83, 2-91, 2-116, 2-117, 2-135, 2-146, 2-147, 2-150, 2-236; 3.3-1, 3.3-3, 3.3-7, 3.3-17, 3.3-19, 3.3-20, 3.3-21, 3.3-32, 3.3-37, 3.3-39, 3.3-42, 3.3-44, 3.3-51, 3.3-54, 3.3-56, 3.3-59, 3.3-60, 3.3-63, 3.3-64, 3.3-65, 3.3-66, 3.3-68, 3.5-9, 3.7-1, 3.7-23, 3.7-30, 3.7-31, 3.8-27, 3.8-30, 3.12-12, 3.14-3, 3.19-1; 4-2, 4-3
Tailings Facility	2-38
Vegetation	ES-7-ES-11, ES-13, ES-15, ES-23; 2-42, 2-46, 2-49, 2-57, 2-64, 2-68, 2-83, 2-84, 2-90, 2-104, 2-105, 2-110, 2-116-2-118, 2-120-2-122, 2-128, 2-143, 2-146, 2-148, 2-150, 2-151, 2-170, 2-173, 2-203, 2-219, 2-221-2-223, 2-225-2-229, 2-231-2-234, 2-238-2-240, 2-246; 3.1-1, 3.1-5, 3.2-12, 3.3-2, 3.3-3, 3.3-50, 3.3-52, 3.3-63, 3.3-65, 3.3-66, 3.4-7-3.4-11, 3.5-1-3.5-15, 3.6-1, 3.6-3, 3.6-4, 3.6-6, 3.6-7, 3.7-1, 3.7-22-3.7-28, 3.7-30-3.7-32, 3.7-34, 3.7-37, 3.7-38, 3.8-5, 3.8-6, 3.8-9, 3.8-10, 3.8-15-3.8-19, 3.8-24-3.8-27, 3.8-30, 3.8-35, 3.8-36, 3.9-1, 3.9-4, 3.9-6, 3.9-8-3.9-11, 3.10-1, 3.10-5, 3.11-6, 3.12-10, 3.12-14, 3.13-5, 3.14-3, 3.14-13, 3.14-15, 3.15-8, 3.16-6, 3.16-7, 3.17-31, 3.19-1, 3.19-3, 3.19-10, 3.19-11, 3.19-15, 3.19-16, 3.20-6, 3.21-1, 3.22-3, 3.23-2
Visual Resources	ES-22, ES-23; 1-6; 2-128, 2-134, 2-220, 2-226, 2-231, 2-233, 2-252; 3.1-5, 3.12-10, 3.12-11, 3.12-14, 3.19-1-3.19-3, 3.19-8, 3.19-10, 3.19-14-3.19-16, 3.22-7; 4-2
Waste Management	1-7; 2-92, 2-94, 2-95, 2-113-2-115; 3.20-4

Waste Rock	ES-5-ES-7; 2-19, 2-20, 2-44-2-46, 2-51-2-54, 2-59-2-61, 2-65, 2-69-2-75, 2-78, 2-79, 2-82-2-84, 2-98-2-100, 2-105-2-107, 2-111, 2-112, 2-116, 2-119, 2-140, 2-147, 2-152, 2-161, 2-165, 2-170, 2-183, 2-198-2-200, 2-202, 2-212, 2-216, 2-217, 2-220, 2-229, 2-230, 2-235, 2-237; 3.2-2, 3.2-8, 3.2-9, 3.2-10, 3.2-11, 3.2-13, 3.3-21, 3.3-23-3.3-25, 3.3-29, 3.3-32, 3.3-44-3.3-46, 3.3-50, 3.3-51, 3.3-54, 3.3-59, 3.3-65-3.3-67, 3.14-10, 3.14-11; 4-3
Water Management	2-42, 2-43, 2-49, 2-58, 2-64, 2-69, 2-73, 2-77, 2-82, 2-104, 2-111, 2-166, 2-169, 2-174-2-176, 2-182, 2-184, 2-198, 2-201, 2-205, 2-206, 2-211, 2-212; 3.3-54, 3.3-60, 3.5-8, 3.5-9, 3.5-11, 3.5-12, 3.7-22, 3.7-23, 3.7-30, 3.7-31, 3.7-34, 3.7-37, 3.8-17, 3.8-26, 3.8-30, 3.8-33, 3.10-5, 3.17-31; 4-2
Water Quality And Quantity	2-51, 2-58, 2-84, 2-117, 2-150, 2-218, 2-219, 2-221-2-223, 2-225-2-229, 2-231-2-234; 3.3-1, 3.3-2, 3.3-63, 3.5-9, 3.5-11, 3.5-12, 3.7-1, 3.7-23, 3.7-31, 3.7-34, 3.7-35, 3.7-37, 3.8-25, 3.8-26, 3.8-30, 3.8-33, 3.9-5, 3.9-6, 3.9-8, 3.9-9, 3.10-3-3.10-5, 3.13-5, 3.13-6, 3.22-2, 3.22-6
Water Resources	ES-6; 1-7; 2-117, 2-119, 2-123, 2-133, 2-236, 2-244; 3.3-15, 3.3-21, 3.3-32, 3.3-39, 3.3-67, 3.7-28, 3.10-1, 3.13-6; 4-1
Water Rights	ES-7; 2-236; 3.3-15-3.3-18, 3.3-42-3.3-44, 3.3-54-3.3-56, 3.3-58-3.3-60, 3.3-62,3.3-64-3.3-66, 3.9-6, 3.9-8
Water Supply	2-42, 2-47-2-49, 2-56, 2-57, 2-63, 2-67, 2-68, 2-72, 2-76, 2-80, 2-81, 2-84, 2-103, 2-104, 2-109, 2-110, 2-228, 2-229; 3.3-12, 3.3-15, 3.3-32, 3.3-34, 3.3-39, 3.3-52, 3.3-56, 3.3-59, 3.3-64, 3.3-66, 3.22-2
White Pine Mine	ES-1; 2-2, 2-13, 2-14, 2-17, 2-21, 2-70, 2-221; 3.20-8
Wilderness	2-234; 3.1-3, 3.1-4, 3.14-3, 3.14-6, 3.14-12, 3.16-6, 3.22-6
Wildlife	ES-3, ES-6, ES-8, ES-9, ES-10, ES-12, ES-13, ES-14, ES-19, ES-21; 1-1, 1-6; 2-42, 2-47, 2-55, 2-62, 2-86, 2-88, 2-115, 2-123-2-125, 2-131-2-133, 2-143, 2-149, 2-182, 2-191, 2-211, 2-217, 2-219, 2-221-2-223, 2-225-2-232, 2-234, 2-240, 2-242; 3.1-1, 3.1-5, 3.3-1, 3.3-16, 3.3-52, 3.3-64, 3.4-9, 3.5-4, 3.5-7, 3.5-9, 3.5-13-3.5-15, 3.6-4, 3.7-1-3.7-3, 3.7-12, 3.7-14, 3.7-22-3.7-31, 3.7-33, 3.7-34, 3.7-37-3.7-41, 3.8-3, 3.8-7, 3.8-9, 3.8-10, 3.8-15-3.8-17, 3.8-18, 3.8-26, 3.8-27, 3.8-30, 3.8-33-3.8-38, 3.9-1, 3.9-6, 3.10-3, 3.10-4, 3.15-6, 3.15-7, 3.16-1, 3.16-4, 3.16-6, 3.16-7, 3.17-22, 3.17-27, 3.19-1, 3.20-6, 3.21-1, 3.22-3, 3.22-4, 4-2-4-4
Winrock Area	2-31, 2-58-2-63, 2-175, 2-205, 2-217, 2-221; 3.4-6, 3.12-11, 3.19-13,
Yankee Mine	ES-1, ES-2; 1-1; 2-1, 2-2, 2-4-2-6, 2-16, 2-21-2-24, 2-95, 2-98, 2-105, 2-221; 3.2-1, 3.12-7, 3.20-8,

Appendix A

Detailed Conceptual Schedule for Reclamation, Closure, and Post-closure

Appendix A1

Proposed Action - Conceptual Reclamation Schedule for the North Operations Area Project

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Appendix A1 Proposed Action - Conceptual Reclamation Schedule for the North Operations Area Project[1,2]

	Year																																																	
Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50 to 80
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Poker Flats Pit																																																		
Duke Pit																																																		
Redbird Pit																																																		
Casino Pit																																																		
Royale Pit																																																		
Bida Pit																																																		
Winrock Main, North, and South Pits																																																		
Top Pit Complex																																																		
South Duke Pit																																																		
Pit Safety Berm Reclamation																																																		
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Appendix A1 Proposed Action - Conceptual Reclamation Schedule for the North Operations Area Project[1,2]

Component	Year																																																
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Appendix A1 Proposed Action - Conceptual Reclamation Schedule for the North Operations Area Project[1,2]

	Year																																																	
Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50 to 80
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Backfill/Regrade																																																		
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Appendix A1 Proposed Action - Conceptual Reclamation Schedule for the North Operations Area Project[1,2]

Component	Year																																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50 to 80
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Reclamation Monitoring																																																		
Post-closure Monitoring																																																		

[1]This schedule is conceptual and subject to changes due to mining sequences that may affect the overall plan.

[2]The shaded areas indicate the potential timeframe when certain activities could occur, but do not imply an actual duration for this conceptual reclamation schedule.

Source: Barrick 2012a.

Appendix A2

Proposed Action - Conceptual Reclamation Schedule for the South Operations Area Project

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Appendix A2 Proposed Action - Conceptual Reclamation Schedule for the South Operations Area Project[1,2]

Component	Year																																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50 to 80
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Gator Pit																																																		
Yankee Pit																																																		
Vantage Pit																																																		
Pit Safety Berm Reclamation																																																		
Earthworks																																																		
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Rock Disposal Area Reclamation																																																		
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Appendix A2 Proposed Action - Conceptual Reclamation Schedule for the South Operations Area Project[1,2]

Component	Year																																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50 to 80
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[1]This schedule is conceptual and subject to changes due to mining sequences that may affect the overall plan.

[2]The shaded areas indicate the potential timeframe when certain activities could occur, but do not imply an actual duration for this conceptual reclamation schedule.

Source: Barrick 2012a.

Appendix A3

North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the North Operations Area Project

Appendix A3 North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the North Operations Area Project, including Actual Completed Reclamation[1,2,3]

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050-2079
Component	**COMPLETED**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36 to 64**
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Redbird Pit																																					
Keno Pit																																					
Duke Pit																																					
Bida Pit																																					
Saga Pit																																					
LBM Pit																																					
Winrock Main, North, and South Pits																																					
Top Pit Complex																																					
Pit Safety Berm Reclamation																																					
Earthworks																																					
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Rock Disposal Area Reclamation																																					
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Growth Media Application																																					
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Galaxy RDA																																					
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Horseshoe RDA																																					
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Casino RDA																																					
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Growth Media Application																																					
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Appendix A3 North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the North Operations Area Project, including Actual Completed Reclamation[1,2,3]

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050-2079
Component	**COMPLETED**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36 to 64**
Duke RDA																																					
Contour/Regrade																																					
Growth Media Application																																					
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Winrock North, West, and East RDAs																																					
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Heap Leach Facility Earthwork																																					
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BMM 2/3 Expansion HLF																																					
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South Poker Flats HLF																																					
Contour/Regrade																																					
Growth Media Application																																					
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Process Ponds Reclamation																																					
Backfill/Regrade																																					
Cover/Growth Media Application																																					
Seed																																					
Support Facilities Reclamation																																					
Contour/Regrade																																					
Growth Media Application																																					
Seed																																					
Building Demolition and Reclamation																																					
Structure Removal																																					
Concrete Rubblizing																																					
Cover/Growth Media Application																																					
Seed																																					

Appendix A3 North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the North Operations Area Project, including Actual Completed Reclamation[1,2,3]

		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050-2079
Component	**COMPLETED**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36 to 64**
Plant Site Reclamation																																					
Contour/Regrade																																					
Growth Media Application																																					
Seed																																					
Well Abandonment																																					
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Closure																																					
Interim Fluid Management																																					
Mooney North HLF																																					
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Mooney Deep South HLF																																					
BMM 2/3 Expansion HLF																																					
South Poker Flats HLF																																					
Fluid Inventory Reduction																																					
Mooney North HLF																																					
Recirculation and Active Evaporation																																					
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Mooney Deep South HLF																																					
Recirculation and Active Evaporation																																					
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BMM 2/3 Expansion HLF																																					
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South Poker Flats HLF																																					
Recirculation and Active Evaporation																																					
ET Cells																																					
Monitoring																																					
Reclamation Monitoring																																					
Post-Closure Monitoring																																					

[1]This schedule is conceptual and subject to changes due to mining sequences that may affect the overall plan.

[2]The entirety of this conceptual reclamation schedule is based on reclamation activities for bonding purposes. The Poker Flats RDA Phase I reclamation, pursuant to the Area 6 Mule Deer Working Group Habitat Management Practices (Area 6 Plan) would be preformed simultaneously with reclamation activities for bonding purposes.

[3]The shaded areas indicate the potential timeframe when certain activities could occur, but do not imply an actual duration for this conceptual reclamation schedule.

Source: Barrick 2014b.

Appendix A4

North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the South Operations Area Project

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Appendix A4 North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the South Operations Area Project[1,2]

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048
Component	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**
Open Pit Closure																																		
Gator Pit																																		
Yankee Pit																																		
Vantage Pit																																		
Pit Safety Berm Reclamation																																		
Earthworks																																		
Seed																																		
Rock Disposal Area Reclamation																																		
Gator North and Gator South RDAs																																		
Contour/Regrade																																		
Growth Media Application																																		
Seed																																		
Luxe RDA																																		
Contour/Regrade																																		
Growth Media Application																																		
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Yankee North RDA																																		
Contour/Regrade																																		
Growth Media Application																																		
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Yankee West RDA																																		
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Yankee South RDA																																		
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Growth Media Application																																		
Seed																																		
Vantage RDA																																		
Contour/Regrade																																		
Growth Media Application																																		
Seed																																		
Heap Leach Facility Earthwork																																		
Yankee HLF																																		
Contour/Regrade																																		
Growth Media Application																																		
Seed																																		
Vantage HLF																																		
Contour/Regrade																																		
Growth Media Application																																		
Seed																																		
Process Pond Reclamation																																		
Backfill/Regrade																																		
Cover/Growth Media Application																																		
Seed																																		
Support Facilities Reclamation																																		
Contour/Regrade																																		
Growth Media Application																																		
Seed																																		
Building Demolition and Reclamation																																		
Structure Removal																																		
Concrete Rubblizing																																		
Cover/Growth Media Application																																		
Seed																																		

Appendix A4 North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the South Operations Area Project[1,2]

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048
Component	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**
Haul Roads, Access Roads, Ancillary Facilities (Non-structure related) Reclamation																																		
Contour/Regrade																																		
Growth Media Application																																		
Seed																																		
Plant Site Reclamation																																		
Contour/Regrade																																		
Growth Media Application																																		
Seed																																		
Well Abandonment																																		
Well Abandonment																																		
Exploration																																		
Exploration																																		
Closure																																		
Interim Fluid Management																																		
Yankee HLF																																		
Vantage HLF																																		
Fluid Intenvory Reduction																																		
Yankee HLF																																		
Recirculation and Active Evaporation																																		
ET Cells																																		
Vantage HLF																																		
Recirculation and Active Evaporation																																		
ET Cells																																		
Monitoring																																		
Reclamation Monitoring																																		
Post-Closure Monitoring																																		

[1]This schedule is conceptual and subject to changes due to mining sequences that may affect the overall plan.

[2]The shaded areas indicate the potential timeframe when certain activities could occur, but do not imply an actual duration for this conceptual reclamation schedule.

Source: Barrick 2014b.

Appendix A5

North and South Operations Area Facilities WRM Alternative – Conceptual Reclamation Schedule for the North Operations Area Project

Appendix A5 North and South Operations Area Facilities WRM Alternative - Conceptual Reclamation Schedule for the North Operations Area Project[1,2]

	Year																																																	
Component	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50 to 58**
Open Pit Reclamation																																																		
Numbers Pit Complex																																																		
Poker Flats Pit																																																		
Redbird Pit																																																		
Duke Pit																																																		
Bida Pit																																																		
Saga Pit																																																		
Winrock Main, North, and South Pits																																																		
Top Pit Complex																																																		
Pit Safety Berm Reclamation																																																		
Earthworks																																																		
Seed																																																		
Rock Disposal Area Reclamation																																																		
Rat West RDA (Complete)																																																		
Contour/Regrade																																																		
Growth Media Application																																																		
Seed																																																		
Poker Flats RDA[2]																																																		
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Growth Media Application																																																		
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Galaxy RDA																																																		
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Growth Media Application																																																		
Seed																																																		
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Contour/Regrade																																																		

Appendix A5 North and South Operations Area Facilities WRM Alternative - Conceptual Reclamation Schedule for the North Operations Area Project[1,2]

	Year																																																	
Component	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50 to 58**
Growth Media Application																																																		
Seed																																																		
Duke RDA																																																		
Contour/Regrade																																																		
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Contour/Regrade																																																		
Growth Media Application																																																		
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Belmont RDA																																																		
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Belmont South RDA																																																		
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Growth Media Application																																																		
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South Water Canyon RDA																																																		
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East Sage RDA																																																		
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Contour/Regrade																																																		
Growth Media Application																																																		
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Appendix A5 North and South Operations Area Facilities WRM Alternative - Conceptual Reclamation Schedule for the North Operations Area Project[1,2]

	Year																																																	
Component	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50 to 58**
Contour/Regrade																																																		
Growth Media Application																																																		
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South Poker Flats HLF																																																		
Contour/Regrade																																																		
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Mooney Deep South HLF																																																		
BMM 2/3 Expansion HLF																																																		
South Poker Flats HLF																																																		
Fluid Inventory Reduction																																																		
Mooney North HLF																																																		
Recirculation and Active Evaporation																																																		
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Mooney Deep South HLF																																																		
Recirculation and Active Evaporation																																																		
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BMM 2/3 Expansion HLF																																																		

Appendix A5 North and South Operations Area Facilities WRM Alternative - Conceptual Reclamation Schedule for the North Operations Area Project[1,2]

	Year																																																	
Component	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50 to 58**
Recirculation and Active Evaporation																																																		
ET Cells																																																		
South Poker Flats HLF																																																		
Recirculation and Active Evaporation																																																		
ET Cells																																																		
Monitoring																																																		
Reclamation Monitoring																																																		
Post-Closure Monitoring																																																		

Appendix A6

North and South Operations Area Facilities WRM Alternative – Conceptual Reclamation Schedule for the South Operations Area Project

Same as the Reconfigurations Alternative, see Appendix A4 North and South Operations Area Facilities Reconfiguration Alternative - Conceptual Reclamation Schedule for the South Operations Area Project

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Appendix B

Water Quality

Table B-1

Seep and Spring Inventory

Table B-1. Seep and Spring Inventory

Basin Number	Hydrographic Basin	Spring Name	Elevation (Feet-AMSL)	Monitor Site	Data Source	Monitoring Period	Flow Range	Remarks	Acres Wetland (JBR 2011)
47	Huntington Valley	Mill Springs (Upper)	7,283	Yes	Tetra Tech 2012	03/2004 - 10/2012	ND - 1.5	No surface flow observed in 2012. Location JBR No. 3. in JBR 2011.	0.00
47	Huntington Valley	JBR No. 12	-	No	JBR 2011	-	-	In channel seep, surface water 0.25 inches deep, water table at 9 inches below ground surface (JBR 2011).	0.46
47	Huntington Valley	JBR No. 11	-	No	JBR 2011	-	-	In channel seep, surface water 0.25 inches deep, water table at 8 inches below ground surface (JBR 2011).	0.52
47	Huntington Valley	JBR No. 10	-	No	JBR 2011	-	-	In channel seep, saturated to 4 inches below ground surface (JBR 2011).	0.99
47	Huntington Valley	JBR No. 9	-	No	JBR 2011	-	-	In channel seep with water table 7 inches below ground (JBR 2011).	0.63
47	Huntington Valley	Mill Springs (Lower)	7,046	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 65.9	Site often has insufficient flow to measure, and is periodically dry. Location JBR No. 6 in JBR 2011.	2.11
47	Huntington Valley	Mill Spring	7425	No	JBR 2011, Geomega 2015	-	-	Shown as Mill Spring on 7.5 min. USGS topo. Location JBR No. 13 in JBR 2011. Non-functional piped trough. Flowing water with saturation at the ground surface. Note: text indicated 1.98 acre which does not match with the 0 acres in Table 5 assumed to be a typo (JBR 2011).	1.98
154	Newark Valley	Water Canyon Spring	7,460	No	Geomega 2014b, Geomega 2015		-		
154	Newark Valley	JBR No. 14	7252	No	JBR 2011, Geomega 2015	03/2006 - 10/2012	ND	In channel seep, surface water 0.25 inches deep, saturated from surface to 6 inches below ground surface. Stockpond with cattails noted downstream of seep (JBR 2011).	13.68

Table B-1. Seep and Spring Inventory

Basin Number	Hydrographic Basin	Spring Name	Elevation (Feet-AMSL)	Monitor Site	Data Source	Monitoring Period	Flow Range	Remarks	Acres Wetland (JBR 2011)
154	Newark Valley	South Water Canyon Seep	7,275	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 228	Typically flowing. Location JBR No. 4 in JBR 2011.	19.20
176	Ruby Valley	JBR No. 7	-	No	JBR 2011	-	-	Also known as East Sage Spring. Surface water ponded 0.5 inch captured by berms and unsaturated four inches below ground surface (JBR 2011).	0.00
176	Ruby Valley	Cherry Springs	7,515	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 12.3	Well located at spring site. Location JBR No. 5 in JBR 2011. Stock pond collects runoff from drainage. Periodically dry.	0.00
47	Huntington Valley	Cracker Johnson Spring No. 2	6,782	Yes	Tetra Tech 2012	6/2006 - 10/2012	ND - 1.0	Small pool, periodically dry, flow estimated and not measured.	
47	Huntington Valley	Cracker Johnson Spring No. 1	6,884	Yes	Tetra Tech 2012	6/2006 - 10/2012	ND -1.0	Large pool (perennial), flow estimated and not measured.	
47	Huntington Valley	JBR No. 1	-	No	JBR 2011	-	-		
47	Huntington Valley	JBR No. 15	-	No	JBR 2011	-	-	Hillside seep with flowing water. Undaturated 5 inches below ground surface (JBR 2011).	1.28
175	Long Valley	Tognini Springs	7,049	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 7.2	Consistent flow since 2007.	
175	Long Valley	Twin Springs	7,548	Yes	Tetra Tech 2012	10/2009 - 10/2012	ND	Dry to small flows (insufficient to measure).	
175	Long Valley	Willow Springs (NOA)	7,229	No	BLM 2009; Geomega 2014b, Geomega 2015	-	-		
175	Long Valley	Twin Trough	6,946	Yes	Tetra Tech 2012	06/2006 - 10/2012	ND -3.4	Always flowing until October 2012 (dry).	
175	Long Valley	Mud Springs	7,062	Yes	Tetra Tech 2012	11/2005 - 10/2012	0.4 - 5.9	Always some flow.	
175	Long Valley	Woodchuck Springs	7,172	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 6.4	Consistent flow from 11/2005 to 05/2012; dry in October 2012.	

Table B-1. Seep and Spring Inventory

Basin Number	Hydrographic Basin	Spring Name	Elevation (Feet-AMSL)	Monitor Site	Data Source	Monitoring Period	Flow Range	Remarks	Acres Wetland (JBR 2011)
175	Long Valley	Little Willow Springs	7,891	Yes	Tetra Tech 2012	11/2009 - 10/2012	ND - 1.4	Pool, flow often not measurable.	
175	Long Valley	Moss Spring	7,925	Yes	Tetra Tech 2012	09/2006 - 10/2012	ND	Shallow pond, flow not measurable.	
175	Long Valley	Willow Springs (SOA)	7,059	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 5.0	Typically flowing.	
175	Long Valley	Cupper	8,599	No	BLM 2009 (Tetra Tech 2007)		-		
154	Newark Valley	Bourne-Tunnel Springs	7,193	Yes	Tetra Tech 2012	05/2000 - 10/2012	ND -8.0	Dry during both sampling events in 2012.	
154	Newark Valley	Warm Springs	5,922	Yes	Tetra Tech 2012	03/2006 - 10/2012	ND	Large perennial pond with fish (approximately 7 acres). Flow not measurable.	
154	Newark Valley	Minoletti Springs	5,870	Yes	Tetra Tech 2012	03/2006 - 10/2012	ND	Large pond (perennial), source flow cannot be measured.	
154	Newark Valley	Minoletti Springs	5,873	No	NAPP Imagery			Large spring apparent on aerial photos.	
154	Newark Valley	Goicoechea Springs	5,842	Yes	Tetra Tech 2012	03/2006 - 10/2012	ND -898.6	Large pond (perennial), source flow is difficult to determine.	
154	Newark Valley	Spring No. 1	5,866	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 229	Spring cheek channel (perennial) overgrown and difficult to measure.	
154	Newark Valley	Unnamed Spring	5,863	No	BLM 2009	-	-		
154	Newark Valley	Spring No. 2	5,864	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 120.7	Spring cheek channel (perennial) with high velocity flows.	
154	Newark Valley	Unnamed Spring	-	No	NAPP Imagery	-	-	Large spring apparent on aerial photos.	
154	Newark Valley	Unnamed Spring	-	No	NAPP Imagery	-	-	Large spring apparent on aerial photos.	
154	Newark Valley	Cottonwood Springs	7,793	Yes	Tetra Tech 2012	05/2007 - 10/2012	ND - 15.3	Multiple seeps with immeasurable flow (perennial).	

Table B-1. Seep and Spring Inventory

Basin Number	Hydrographic Basin	Spring Name	Elevation (Feet-AMSL)	Monitor Site	Data Source	Monitoring Period	Flow Range	Remarks	Acres Wetland (JBR 2011)
154	Newark Valley	Moore Springs No. 1	7,171	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 5.8	Wetted channel (perennial).	
154	Newark Valley	Moore Springs No. 2	7,348	Yes	Tetra Tech 2012	11/2005 - 10/2012	1.8 - 2.6	Pond fed by discharge pipe with consistent flow (perennial).	
154	Newark Valley	Moore Springs No. 3	7,455	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 1.5	Perennial wet area, discharge rate can only be estimated during low flow conditions.	
154	Newark Valley	Spring No. 5	5,850	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 1.0	Consistent flow (perennial). Flow is not measurable.	
154	Newark Valley	Spring No. 3	6,483	Yes	Tetra Tech 2012	11/2005 - 10/2012	10 - 579	Spring cheek channel with consistent perennial flow.	
154	Newark Valley	Spring No. 4 (Upper)	6,525	Yes	Tetra Tech 2012	11/2005 - 10/2012	0.7 - 236	Spring cheek channel with consistent perennial flow.	
154	Newark Valley	Rock Springs (Upper)	7,629	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 1.0	Perennial flow, flow is dispersed and generally not measurable.	
154	Newark Valley	Beck Springs	6,695	Yes	Tetra Tech 2012	11/2005 - 10/2012	ND - 10.8	Flow supports pool (perennial). Pool often stagnant by fall.	

Source: Geomega 2011a; JBR 2011a; Tetra Tech 2012, Geomega 2014b, Geomega 2015.

Table B-2

Water Rights Inventory

Table B-2 Water Rights Inventory

MAP ID	Basin Number	Basin Name	Application	Change App	Certificate	Priority Date	Status	Source	Township	Range	Section	Diversion Rate (CFS)	Annual Duty (Acre-feet per year)	Type of Use	Owner of Record
HV-155	47	Huntington Valley	48526		12991	5/14/1981	Certificate	UG	24N	56E	11	0.50	230.47	Mining/ Milling	BARRICK GOLD U.S. INC.
HV-158	47	Huntington Valley	52909		0	2/7/1989	Permit	UG	24N	56E	14	1.95	296.77	Mining/ Milling	BARRICK GOLD U.S. INC.
HV-168	47	Huntington Valley	78940		0	2/7/1989	Permit	UG	24N	56E	24	0.05	32.22	Mining/ Milling	BARRICK GOLD U.S. INC. (BALD MOUNTAIN MINE)
LV-008	175	Long Valley	72369	69735	0	4/19/1985	Permit	UG	24N	58E	29	1.00	723.97	Mining/ Milling	BARRICK GOLD U.S. INC.
LV-009	175	Long Valley	70239	56883	0	10/29/1991	Permit	UG	24N	58E	29	1.00	723.97	Mining/ Milling	BARRICK GOLD U.S. INC.
LV-010	175	Long Valley	64061	56763	0	9/23/1991	Permit	UG	24N	58E	29	2.00	1448.52	Mining/ Milling	BARRICK GOLD U.S. INC.
RV-601	176	Ruby Valley	56961		0	11/26/1991	Permit	UG	24N	58E	9	1.99	641.52	Mining/ Milling	BARRICK GOLD U.S. INC.
RV-602	176	Ruby Valley	54243		0	12/18/1989	Permit	UG	24N	58E	16	0.83	536.29	Mining/ Milling	BARRICK GOLD U.S. INC.
RV-605	176	Ruby Valley	84175T	56961	0	11/26/1991	Permit	UG	24N	58E	29	1.12	807.00	Mining/ Milling	BARRICK GOLD U.S. INC
HV-160	47	Huntington Valley	12937		3860	5/31/1949	Certificate	SPR	24N	57E	17	0.02	9.68	Stock	BARRICK GOLD U.S. INC.
HV-164	47	Huntington Valley	R09310		0	4/17/1926	Reserved	SPR	24N	57E	17	0.00	0.00	Stock	BLM
HV-165	47	Huntington Valley	V01560		0		Vested	SPR	24N	57E	17	0.00	0.00	Stock	MOORE, WILLIAM A.
HV-166	47	Huntington Valley	12936		3859	5/31/1949	Certificate	SPR	24N	57E	17	0.02	9.67	Stock	BARRICK GOLD U.S. INC.
NV-001	154	Long Valley	12940		3861	5/31/1949	Certificate	SPR	24N	57E	21	0.02	9.79	Stock	BARRICK GOLD U.S. INC.
NV-002	154	Newark Valley	5325		990	11/27/2018	Certificate	SPR	24N	57E	27	0.03	11.20	Stock	BARRICK GOLD U.S. INC.
RV-603	176	Ruby Valley	83509T	64965	0	3/12/1999	Permit	UG	24N	58E	17	0.01	5.60	Stock	BARRICK GOLD US INC
LV-023	175	Long Valley	55496	35965	0	10/3/1978	Permit	UG	22N	57E	35	1.50	1086.39	Mining/ Milling	BARRICK GOLD U.S. INC.
LV-034	175	Long Valley	56035	52293	0	3/21/1991	Permit	UG	21N	57E	24	1.00	169.40	Mining/ Milling	BARRICK GOLD U.S. INC.
LV-035	175	Long Valley	56034		0	3/21/1991	Permit	UG	21N	57E	24	1.00	304.13	Mining/ Milling	BARRICK GOLD U.S. INC.

Table B-2 Water Rights Inventory

MAP ID	Basin Number	Basin Name	Application	Change App	Certificate	Priority Date	Status	Source	Township	Range	Section	Diversion Rate (CFS)	Annual Duty (Acre-feet per year)	Type of Use	Owner of Record
LV-036	175	Long Valley	56036	52294	0	3/21/1991	Permit	UG	21N	57E	24	1.00	169.40	Mining/ Milling	BARRICK GOLD U.S. INC.
HV-149	47	Huntington Valley	62945		0	3/26/1997	Permit	UG	25N	55E	26	4.00	1680.00	Irregation	BARRICK GOLD U.S. INC.
HV-152	47	Huntington Valley	62946		0	3/26/1997	Permit	UG	25N	55E	35	2.00	600.00	Irregation	BARRICK GOLD U.S. INC.
LV-014	175	Long Valley	35797		11603	8/23/1978	Certificate	SPR	23N	58E	25	0.20	30.08	Irregation	BARRICK GOLD U.S. INC.
LV-016	175	Long Valley	62956		0	3/26/1997	Permit	UG	23N	58E	36	2.00	480.00	Irregation	BARRICK GOLD U.S. INC.
NV-007	154	Newark Valley	V01255		0		Vested	SPR	23N	55E	14	0.00	0.00	Irregation	BARRICK GOLD U.S. INC.
NV-008	154	Newark Valley	80090		0	3/26/1997	Permit	UG	23N	55E	24	1.56	0.00	Irregation	BARRICK GOLD US INC
NV-009	154	Newark Valley	80089	62947	0	3/26/1997	Permit	UG	23N	55E	24	0.67	480.00	Irregation	BARRICK GOLD US INC
NV-010	154	Newark Valley	81962	23508	0	4/23/1963	Permit	UG	23N	55E	24	2.19	520.00	Irregation	BARRICK GOLD US INC
NV-011	154	Newark Valley	80525	62947	0	3/26/1997	Permit	UG	23N	55E	24	0.50	359.10	Irregation	BARRICK GOLD US INC
NV-012	154	Newark Valley	80528	62955	0	3/26/1997	Permit	UG	23N	55E	24	0.87	36.90	Irregation	BARRICK GOLD US INC
NV-013	154	Newark Valley	80024		0	3/26/1997	Permit	UG	23N	56E	19	1.50	0.00	Irregation	BARRICK GOLD US INC
NV-014	154	Newark Valley	80022	62947	0	3/26/1997	Permit	UG	23N	56E	19	0.73	520.00	Irregation	BARRICK GOLD US INC
NV-015	154	Newark Valley	80527	62955	0	3/26/1997	Permit	UG	23N	55E	24	0.25	104.28	Irregation	BARRICK GOLD US INC
NV-016	154	Newark Valley	80526	62954	0	3/26/1997	Permit	UG	23N	55E	24	1.24	132.12	Irregation	BARRICK GOLD US INC
NV-018	154	Newark Valley	80025		0	3/26/1997	Permit	UG	23N	56E	30	1.50	0.00	Irregation	BARRICK GOLD US INC
NV-019	154	Newark Valley	80023	62947	0	3/26/1997	Permit	UG	23N	56E	30	0.73	520.00	Irregation	BARRICK GOLD US INC
NV-020	154	Newark Valley	V01077		0		Decreed	SPR	23N	55E	26	5.40	5559.80	Irregation	BARRICK GOLD U.S. INC.
NV-021	154	Newark Valley	62947		0	3/26/1997	Permit	UG	23N	55E	26	1.68	1200.90	Irregation	BARRICK GOLD U.S. INC.

Table B-2 Water Rights Inventory

MAP ID	Basin Number	Basin Name	Application	Change App	Certificate	Priority Date	Status	Source	Township	Range	Section	Diversion Rate (CFS)	Annual Duty (Acre-feet per year)	Type of Use	Owner of Record
NV-022	154	Newark Valley	62951		0	3/26/1997	Permit	UG	23N	56E	35	6.00	2400.00	Irregation	BARRICK GOLD U.S. INC.
NV-024	154	Newark Valley	62948		0	3/26/1997	Permit	UG	23N	55E	35	6.00	2640.00	Irregation	BARRICK GOLD U.S. INC.
NV-025	154	Newark Valley	34456		11622	10/27/1977	Certificate	SPR	23N	56E	36	14.80	6509.15	Irregation	BARRICK GOLD U.S. INC.
NV-026	154	Newark Valley	62952		0	3/26/1997	Permit	UG	22N	56E	1	6.00	2640.00	Irregation	BARRICK GOLD U.S. INC.
NV-027	154	Newark Valley	62949		0	3/26/1997	Permit	UG	22N	55E	2	3.00	1560.00	Irregation	BARRICK GOLD U.S. INC.
NV-028	154	Newark Valley	34455		11594	10/27/1977	Certificate	SPR	22N	55E	2	7.10	4457.20	Irregation	BARRICK GOLD U.S. INC.
NV-029	154	Newark Valley	34457		11595	10/27/1977	Certificate	SPR	22N	55E	11	5.80	4199.00	Irregation	BARRICK GOLD U.S. INC.
NV-031	154	Newark Valley	62950		0	3/26/1997	Permit	UG	22N	55E	11	4.00	2896.00	Irregation	BARRICK GOLD U.S. INC.
NV-032	154	Newark Valley	V01453		0		Vested	SPR	22N	55E	11	0.00	0.00	Irregation	BARRICK GOLD U.S. INC.
NV-033	154	Newark Valley	47735	34458	11601	10/27/1977	Certificate	SPR	22N	55E	11	5.60	4054.20	Irregation	BARRICK GOLD U.S. INC.
NV-035	154	Newark Valley	62954		0	3/26/1997	Permit	UG	22N	56E	15	0.08	54.00	Irregation	BARRICK GOLD U.S. INC.
NV-036	154	Newark Valley	34454		11621	10/27/1977	Certificate	SPR	22N	56E	16	0.18	72.00	Irregation	BARRICK GOLD U.S. INC.
NV-037	154	Newark Valley	34459		11596	10/27/1977	Certificate	SPR	22N	55E	14	0.20	144.79	Irregation	BARRICK GOLD U.S. INC.
NV-039	154	Newark Valley	13611		4324	1/25/1951	Certificate	SPR	22N	55E	14	1.00	195.00	Irregation	BARRICK GOLD U.S. INC.
NV-041	154	Newark Valley	35796		11625	8/23/1978	Certificate	SPR	22N	56E	21	0.15	13.20	Irregation	BARRICK GOLD U.S. INC.
NV-042	154	Newark Valley	62953		0	3/26/1997	Permit	UG	22N	56E	21	0.04	9.90	Irregation	BARRICK GOLD U.S. INC.
NV-044	154	Newark Valley	V01561		0		Vested	SPR	22N	55E	34	0.00	0.00	Irregation	HOOPER, R.W.
NV-048	154	Newark Valley	35798		11626	8/23/1978	Certificate	SPR	21N	56E	5	0.20	59.20	Irregation	BARRICK GOLD U.S. INC.
NV-049	154	Newark Valley	18759		6570	4/27/1960	Certificate	SPR	21N	56E	10	0.42	303.54	Irregation	BARRICK GOLD U.S. INC.

Table B-2 Water Rights Inventory

MAP ID	Basin Number	Basin Name	Application	Change App	Certificate	Priority Date	Status	Source	Township	Range	Section	Diversion Rate (CFS)	Annual Duty (Acre-feet per year)	Type of Use	Owner of Record
NV-050	154	Newark Valley	V02453		0		Vested	SPR	21N	56E	9	2.00	400.00	Irregation	BARRICK GOLD U.S. INC.
NV-052	154	Newark Valley	62955		0	3/26/1997	Permit	UG	21N	56E	9	1.05	326.70	Irregation	BARRICK GOLD U.S. INC.
NV-053	154	Newark Valley	V01157		0		Vested	SPR	21N	55E	9	0.00	0.00	Irregation	SMITH, WM. H.
NV-054	154	Newark Valley	V02454		0		Vested	SPR	21N	56E	22	2.00	400.00	Irregation	BARRICK GOLD U.S. INC.
NV-057	154	Newark Valley	V02886		0		Vested	SPR	21N	55E	27	0.84	150.00	Irregation	GOICOECHEA, PETER J AND GLADYS P
NV-060	154	Newark Valley	V02885		0		Vested	SPR	21N	55E	33	0.76	225.00	Irregation	HELD, CHLOE TRUST, U/W PAUL R. HELD
NV-061	154	Newark Valley	7226		1509	10/6/2024	Certificate	SPR	21N	55E	34	0.29	120.20	Irregation	GOICOECHEA, PETER J AND GLADYS P
NV-062	154	Newark Valley	7227		1642	10/6/2024	Certificate	SPR	20N	55E	3	0.37	181.00	Irregation	GOICOECHEA, PETER J AND GLADYS P
NV-066	154	Newark Valley	V01751		0		Vested	SPR	20N	55E	8	0.00	0.00	Irregation	CHLOE HELD TRUST
NV-017	154	Newark Valley	48723		13038	1/16/1985	Certificate	UG	23N	55E	23	0.01	8.01	Quasi-Municipal	BARRICK GOLD U.S. INC.
HV-144	47	Huntington Valley	R09395		0	7/25/2003	Reserved	SPR	25N	55E	20	0.00	0.00	Stock	BLM
HV-145	47	Huntington Valley	1879		69	11/14/1910	Certificate	SPR	25N	55E	20	0.01	2.75	Stock	PARIS FAMILY TRUST
HV-146	47	Huntington Valley	12938		3838	5/31/1949	Certificate	SPR	25N	57E	29	0.02	9.68	Stock	BARRICK GOLD U.S. INC.
HV-148	47	Huntington Valley	8964		2962	6/20/1929	Certificate	SPR	25N	55E	25	0.03	17.92	Stock	BROWN, ARTHUR H.
HV-150	47	Huntington Valley	12939		3930	5/31/1949	Certificate	SPR	25N	57E	32	0.02	9.68	Stock	BARRICK GOLD U.S. INC.
HV-151	47	Huntington Valley	9311		2963	8/7/1930	Certificate	SPR	25N	55E	35	0.03	17.92	Stock	BROWNE, ARTHUR D.
HV-153	47	Huntington Valley	8859		2958	4/6/1929	Certificate	SPR	24N	55E	10	0.03	17.92	Stock	BROWN, ARTHUR H.
HV-157	47	Huntington Valley	8970		2966	6/26/1929	Certificate	SPR	24N	55E	17	0.03	17.92	Stock	BROWN, ARTHUR H.
HV-159	47	Huntington Valley	8969		2965	6/26/1929	Certificate	SPR	24N	55E	15	0.03	17.92	Stock	BROWN, ARTHUR H.

Table B-2 Water Rights Inventory

MAP ID	Basin Number	Basin Name	Application	Change App	Certificate	Priority Date	Status	Source	Township	Range	Section	Diversion Rate (CFS)	Annual Duty (Acre-feet per year)	Type of Use	Owner of Record
HV-161	47	Huntington Valley	46033		14502	9/13/1993	Certificate	SPR	24N	55E	16	0.01	7.96	Stock	BARRICK GOLD U.S. INC.
HV-162	47	Huntington Valley	46034		14503	9/13/1993	Certificate	SPR	24N	55E	16	0.01	9.70	Stock	BARRICK GOLD U.S. INC.
HV-163	47	Huntington Valley	46035		14504	9/13/1993	Certificate	SPR	24N	55E	16	0.01	9.70	Stock	BARRICK GOLD U.S. INC.
HV-167	47	Huntington Valley	46036		14505	9/13/1993	Certificate	SPR	24N	55E	16	0.02	11.29	Stock	BARRICK GOLD U.S. INC.
HV-169	47	Huntington Valley	1820		51	9/14/1910	Certificate	SPR	24N	55E	21	0.01	3.55	Stock	PARIS FAMILY TRUST
HV-170	47	Huntington Valley	8971		2967	6/26/1929	Certificate	SPR	24N	55E	21	0.03	17.92	Stock	BROWN, ARTHUR H.
HV-172	47	Huntington Valley	1824		55	9/14/1910	Certificate	SPR	24N	55E	20	0.01	3.55	Stock	PARIS FAMILY TRUST
HV-173	47	Huntington Valley	46037		14506	9/13/1993	Certificate	SPR	24N	55E	27	0.01	6.44	Stock	BARRICK GOLD U.S. INC.
HV-174	47	Huntington Valley	46038		14507	9/13/1993	Certificate	SPR	24N	55E	27	0.01	6.72	Stock	BARRICK GOLD U.S. INC.
HV-176	47	Huntington Valley	46040		14509	9/13/1993	Certificate	SPR	24N	55E	33	0.02	7.84	Stock	BARRICK GOLD U.S. INC.
HV-177	47	Huntington Valley	46039		14508	9/13/1993	Certificate	SPR	24N	55E	33	0.01	7.84	Stock	BARRICK GOLD U.S. INC.
HV-178	47	Huntington Valley	1821		52	9/14/1910	Certificate	SPR	24N	55E	33	0.01	3.55	Stock	PARIS FAMILY TRUST
LV-006	175	Huntington Valley	11638		3507	7/22/1946	Certificate	SPR	24N	58E	22	0.00	1.32	Stock	ROSENLUND, RAYMOND G.
LV-007	175	Long Valley	5529		646	6/7/2019	Certificate	SPR	24N	58E	22	0.01	4.33	Stock	ROSENLUND, RAYMOND G.
LV-011	175	Long Valley	3030		384	7/8/2014	Certificate	SPR	24N	58E	32	0.01	7.24	Stock	GOICHECHEA, JULIAN
LV-018	175	Long Valley	9430		2919	3/18/1931	Certificate	UG	22N	58E	21	0.03	22.40	Stock	BARRICK GOLD U.S. INC.
LV-020	175	Long Valley	5327		992	11/27/2018	Certificate	SPR	22N	57E	29	0.03	14.58	Stock	BARRICK GOLD U.S. INC.
LV-021	175	Long Valley	43695		11212	5/8/1981	Certificate	UG	22N	58E	34	0.03	22.43	Stock	BARRICK GOLD U.S. INC.
LV-022	175	Long Valley	5324		989	11/27/2018	Certificate	SPR	22N	57E	32	0.03	14.58	Stock	BARRICK GOLD U.S. INC.
LV-024	175	Long Valley	2339		123	2/15/2012	Certificate	SPR	22N	57E	32	0.03	18.11	Stock	BARRICK GOLD U.S. INC.

Table B-2 Water Rights Inventory

MAP ID	Basin Number	Basin Name	Application	Change App	Certificate	Priority Date	Status	Source	Township	Range	Section	Diversion Rate (CFS)	Annual Duty (Acre-feet per year)	Type of Use	Owner of Record
LV-025	175	Long Valley	5326		991	11/27/2018	Certificate	SPR	22N	57E	33	0.03	14.58	Stock	BARRICK GOLD U.S. INC.
LV-026	175	Long Valley	5323		988	11/27/2018	Certificate	SPR	21N	57E	5	0.03	14.58	Stock	BARRICK GOLD U.S. INC.
LV-027	175	Long Valley	2338		122	2/15/2012	Certificate	SPR	21N	57E	6	0.03	10.04	Stock	BARRICK GOLD U.S. INC.
LV-028	175	Long Valley	43696		11213	5/8/1981	Certificate	UG	21N	59E	5	0.03	22.43	Stock	BARRICK GOLD U.S. INC.
LV-029	175	Long Valley	2340		124	2/15/2012	Certificate	SPR	21N	56E	1	0.03	9.70	Stock	BARRICK GOLD U.S. INC.
LV-030	175	Long Valley	2337		121	2/15/2012	Certificate	SPR	21N	57E	8	0.03	9.76	Stock	BARRICK GOLD U.S. INC.
LV-031	175	Long Valley	9350		4242	10/12/1930	Certificate	UG	21N	58E	10	0.03	22.40	Stock	BARRICK GOLD US INC
LV-032	175	Long Valley	7019		1704	12/12/2023	Certificate	UG	21N	58E	7	0.03	22.40	Stock	BARRICK GOLD U.S. INC.
LV-033	175	Long Valley	7927		1705	11/10/2026	Certificate	UG	21N	59E	18	0.05	23.94	Stock	BARRICK GOLD U.S. INC.
LV-037	175	Long Valley	7928		1706	11/10/2026	Certificate	UG	21N	58E	35	0.03	15.96	Stock	BARRICK GOLD U.S. INC.
LV-038	175	Long Valley	14618		4452	11/12/1952	Certificate	UG	21N	59E	31	0.03	3.81	Stock	BARRICK GOLD U.S. INC.
LV-039	175	Long Valley	9368		3904	11/5/1930	Certificate	UG	21N	58E	32	0.03	8.44	Stock	BARRICK GOLD US INC
LV-040	175	Long Valley	9369		2579	11/6/1930	Certificate	UG	20N	58E	8	0.03	22.40	Stock	BARRICK GOLD U.S. INC.
LV-041	175	Long Valley	9386		2578	11/25/1930	Certificate	UG	20N	58E	14	0.03	22.40	Stock	BARRICK GOLD U.S. INC.
NV-003	154	Newark Valley	5322		987	11/27/2018	Certificate	OGW	24N	57E	31	0.03	6.94	Stock	BARRICK GOLD U.S. INC.
NV-004	154	Newark Valley	6964		1454	8/30/2023	Certificate	SPR	23N	55E	3	0.03	8.96	Stock	BARRICK GOLD U.S. INC.
NV-005	154	Newark Valley	64409		16107	8/21/1998	Certificate	UG	23N	56E	11	0.02	11.20	Stock	BARRICK GOLD U.S. INC
NV-023	154	Newark Valley	3522		1468	7/23/2015	Certificate	SPR	23N	55E	33	0.03	13.56	Stock	BARRICK GOLD U.S. INC.
NV-030	154	Newark Valley	2341		125	2/15/2012	Certificate	SPR	22N	55E	9	0.03	10.04	Stock	BARRICK GOLD U.S. INC.
NV-034	154	Newark Valley	V01242		0		Vested	SPR	22N	55E	11	0.01	0.00	Stock	BARRICK GOLD U.S. INC
NV-038	154	Newark Valley	2520		294	10/5/2012	Certificate	SPR	22N	55E	15	0.03	14.56	Stock	BARRICK GOLD U.S. INC.

Table B-2 Water Rights Inventory

MAP ID	Basin Number	Basin Name	Application	Change App	Certificate	Priority Date	Status	Source	Township	Range	Section	Diversion Rate (CFS)	Annual Duty (Acre-feet per year)	Type of Use	Owner of Record
NV-040	154	Newark Valley	16863		4809	2/16/1956	Certificate	UG	22N	55E	15	0.02	11.20	Stock	BARRICK GOLD U.S. INC.
NV-043	154	Newark Valley	V01306		0		Vested	SPR	22N	57E	30	0.03	0.00	Stock	BARRICK GOLD U.S. INC.
NV-045	154	Newark Valley	4789		993	12/17/2017	Certificate	SPR	22N	56E	35	0.03	18.11	Stock	BARRICK GOLD U.S. INC.
NV-047	154	Newark Valley	4790		994	12/17/2017	Certificate	SPR	22N	56E	36	0.03	18.11	Stock	BARRICK GOLD U.S. INC.
NV-051	154	Newark Valley	V01158		0		Vested	SPR	21N	55E	10	0.01	0.00	Stock	SMITH, WM. H.
NV-055	154	Newark Valley	8412		2315	12/27/2027	Certificate	SPR	21N	55E	22	0.01	3.77	Stock	SMITH, KATE P.
NV-056	154	Newark Valley	V01159		0		Vested	SPR	21N	55E	22	0.00	0.00	Stock	SMITH, WM. H.
NV-058	154	Newark Valley	2315		150	1/15/2012	Certificate	SPR	21N	56E	36	0.03	18.11	Stock	GOICOECHEA, PETER J AND GLADYS P
NV-059	154	Newark Valley	V02892		0		Vested	SPR	21N	55E	34	0.00	0.00	Stock	GOICOECHEA, PETER J AND GLADYS P
NV-063	154	Newark Valley	V02891		0		Vested	SPR	20N	57E	6	0.00	0.00	Stock	GOICOECHEA, PETER J AND GLADYS P
NV-065	154	Newark Valley	V02902		0		Vested	SPR	20N	55E	9	0.00	0.00	Stock	GOICOECHEA, PETER J AND GLADYS P
NV-067	154	Newark Valley	V02896		0		Vested	SPR	20N	56E	10	0.00	0.00	Stock	GOICOECHEA, PETER J AND GLADYS P
RV-599	176	Newark Valley	4138		1572	8/30/2016	Certificate	SPR	25N	59E	28	0.02	10.74	Stock	ROSENLUND, RAYMOND G.
RV-600	176	Ruby Valley	64965		0	3/12/1999	Permit	UG	24N	58E	6	0.01	5.60	Stock	BARRICK GOLD U.S. INC.
RV-604	176	Ruby Valley	5530		647	6/7/2019	Certificate	SPR	24N	58E	16	0.01	4.27	Stock	ROSENLUND, RAYMOND G.
NV-006	154	Newark Valley	64645		16178	11/30/1998	Certificate	UG	23N	56E	11	0.01	2.00	Wildlife	BLM

SPR = Spring
UG = Underground (i.e., groundwater)
OGW = Other groundwater
Source: NDWR 2014.

Table B-3

Values for General Water Quality Constituents at Monitored Locations

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Table B-3 Values for General Water Quality Constituents at Monitored Locations[1]

Site	Bicarbonate	Calcium	Chloride	pH	Sodium	Sulfate	TDS
Huntington Valley Seeps and Springs							
Cracker Johnson Spring No. 1	212 - 325	37.3 - 61.0	24.0 - 41.0	7.58 - 8.57	27.0 - 46.1	29.0 - 71.0	326 - 480
Cracker Johnson Spring No. 2	280 - 573	24.9 - 390	40.7 - 105	7.77 - 8.74	66.7 - 141	38.0 - 177	468 - ***1,110*** [2]
Mill Springs Lower	223 - 326	74.4 - 108	12.6 - 26	7.2 - 8.17	12.8 - 19.0	19.3 - 25.0	294 - 437
Mill Springs Upper	214 - 270	73.9 - 91	9.1 - 63	8.02 - 8.14	16.0 - 18.7	21.0 - 27.0	348
Long Valley Seeps and Springs							
Little Willow Spring	91.1 - 142	33.0 - 41.7	8.0 - 9.0	7.78 -8.37	8.0 - 9.7	13.5 - 24.0	136 - 500
Moss Spring	96.4 - 128	31.0 - 34.0	2.0 - 3.29	7.78 - 8.61	5.0 - 7.0	5.0 - 10.0	112 - 228
Mud Spring	314- 410	110 - 140	26.0 - 33.0	7.36 - 8.21	33.0 - 42.2	73.0 - 101	444 - ***540*** [2]
Tognini Spring	187 - 236	65.5 - 79.5	8.0 - 11.0	7.35 - 8.09	12.0- 14.1	19.0 - 28.0	234 - 294
Twin Spring	63.5 - 97.2	14.2 - 20.0	4.73 - 6.51	7.14 - 7.67	11.2 - 14.3	6.91 - 8.72	135 - 258
Twin Trough	78.1 - 105	17.0 - 24.6	2.0 - 6.01	6.53 - 7.78	12.0 - 17.7	8.26 - 18.0	128 - 165
Willow Spring	316 - 396	92.1 - 118	12.0 - 20.5	7.26 - 8.06	17.0 - 26.7	28.8 - 47.3	336 - 484
Woodchuck Spring	273 - 372	101 - 127	16.0 - 24.0	7.23 - 7.95	25.0 - 29.8	67.0 - 91.7	390 - 500
Newark Valley Seeps and Springs							
Beck Spring	116-239	37.1 - 69	14 - 18	7.53 - 8.5	18 - 19.2	22.1 - 26	181 - 274
Bourne Tunnel Spring	267 - 283	74.5 - 76.3	3.03 - 3.49	7.82 - 7.99	5.32 - 5.72	10.6 - 11.3	279 - 318
Cottonwood Spring	59.1 - 76	15 - 17.7	2 - 4.06	7.85 - 8.23	5 - 7.42	6 - 10	86 - 144
Goicoechea Spring	85 - 288	40.6 -76	1.97 - 4	7.17 - 8.5	4.67 - 8.2	13.3 - 28	142 - 289
Minoletti Spring	140 - 212	31 - 91.9	3 - 6	7.58 - 8.84	6.9 - 10.6	8 - 26	152 - 238
Moore Spring No. 1	153 - 189	46.7 - 54.5	5 - 9	7.82 - 8.45	5.4 - 6.5	<1 - 19	170 - 233

Table B-3 Values for General Water Quality Constituents at Monitored Locations[1]

Site	Bicarbonate	Calcium	Chloride	pH	Sodium	Sulfate	TDS
Moore Spring No. 2	104 - 132	29.4 - 34.9	<1 - 6	7.78 - 8.48	9 - 10	10 -14	144 - 202
Moore Spring No. 3	134 - 187	39.4 -49.1	6 - 8.07	7.29 - 8.11	13.4 - 15.6	13 - 30	172 - 237
Rock Spring (Lower)	165 - 200	50.9 - 55	8 - 10	7.88 - 8.2	9.5 - 10	18	174 - 232
Rock Spring (Upper)	158 - 219	12.3 - 22	6.76 - 10	7.39 - 8.34	9.7 - 11	12.3 - 22	180 - 256
South Water Canyon Seep	<1 - 214	47.3 - 70	5 - 34	2.41 - 8.3	10.7 - 17	11.3 - ***725*** [2]	192 - 410
Spring No. 1	206 - 263	45 - 53.9	5 - 9	7.61 - 8.1	16.2 - 20.4	7 - 32	242 - 292
Spring No. 2	204 - 256	39 - 49.4	6 - 7.92	7.86 - 8.4	18.8 - 24.4	29 - 34	226 - 280
Spring No. 3	135 - 171	40.2 - 48.2	5 - 6.7	7.75 - 8.41	7 - 8.3	12 - 23	144 - 185
Spring No. 4 (upper)	173 -342	53.4 - 93.8	6 - 9	8.07 - 8.59	8.7 - 16.6	14 - 27	192 - 337
Spring No. 5	137 -187	40.5 - 48.2	6 - 6.55	7.85 - 8.41	9 - 10.4	13 - 33	152 - 194
Warm Spring	249 - 320	56.8 - 69.4	5 - 7.29	7.57 - 8.69	16.9 - 21	0.1 - 0.208	276 - 326
Ruby Valley Springs and Seeps							
Cherry Spring	49.5 - 315	10.6 - 41	3 - 20	7.29 - 8.11	8.54 - 20.4	0.59 - 31	81 - 252

[1] Concentrations are in milligrams per liter.

[2] Bold italicized values are discussed in the text.

[3] Sample from well adjacent to spring site.

Source: Tetra Tech 2011

Table B-4

Total Metals Ranges at Monitored Locations

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Table B-4 Total Metals Ranges at Monitored Locations[1]

Site	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Zinc
Livestock Watering Standards [2]	0.2	0.05	1.0	0.5	0.10	0.01	0.05	25
Huntington Valley Seeps and Springs								
Cracker Johnson Spring No. 1	0.0097 - ***0.34*** [3]	ND	ND - 0.0106	ND	ND - 0.008	ND	ND	ND - 0.06
Cracker Johnson Spring No. 2	0.087 - 0.192	ND	0.0101 - 0.071	0.02 - 0.098	0.00413 - 0.066	ND - 0.0005	ND - 0.00563	0.0401 - 0.46
Mill Springs Lower	0.011 - 0.0443	ND	ND	ND - 0.011	ND - 0.00423	ND	ND	ND - 0.0217
Mill Springs Upper	0.007	ND	ND	ND	ND	ND	ND	0.04
South Water Canyon Seep	0.0195 - 0.0396	ND	ND	ND	ND - 0.002	ND - 0.0008	ND	ND - 0.03
Long Valley Seeps and Springs								
Little Willow Spring	ND - 0.0089	ND	ND - 0.0099	ND - 0.01	ND - 0.00442	ND	ND	ND - 0.0383
Moss Spring	ND	ND		ND - 0.002	ND	ND	ND	ND
Mud Spring	ND	ND	ND	ND	ND	ND	ND - 0.0107	ND
Tognini Spring	ND - 0.002	ND	ND	ND	ND	ND	ND - 0.001	ND
Twin Spring	ND - 0.00812	ND	ND - 0.0144	ND - 0.02	ND - 0.0173	ND	ND	ND - 0.129
Twin Trough	ND - 0.001	ND	ND	ND	ND	ND	ND	ND
Willow Spring	ND - 0.00331	ND	ND - 0.002	ND	ND	ND	ND - 0.001	ND - 0.0214
Woodchuck Spring	ND	ND	ND - 0.001	ND	ND	ND	ND - 0.00642	ND
Newark Valley Seeps and Springs								

Table B-4 Total Metals Ranges at Monitored Locations[1]

Site	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Zinc
Beck Spring	ND - 0.00403	ND	ND - 0.0066	ND	ND	ND	ND	ND 0.0131
Bourne Tunnel Spring	ND	ND	ND	ND	ND	ND	ND	ND
Cottonwood Spring	ND	ND	ND	ND	ND	ND	ND	ND
Goicoechea Spring	ND - 0.011	ND	ND	ND - 0.162	ND - 0.048	ND - 0.0031	ND - 0.005	ND - 0.0407
Minoletti Spring	ND - 0.01	ND	ND - 0.004	ND - 0.004	ND - 0.003	ND - 0.002	ND - 0.03	ND - 0.06
Moore Spring No. 1	ND - 0.01	ND	ND	ND	ND - 0.002	ND	ND - 0.002	ND
Moore Spring No. 2	ND - 0.009	ND	ND	ND	ND	ND	ND - 0.001	ND
Moore Spring No. 3	ND	ND	ND	ND	ND - 0.001	ND - 0.0008	ND - 0.002	ND - 0.03
Rock Spring (Lower)	ND	ND	ND	0.002	ND	ND	ND	ND
Rock Spring (Upper)	ND - 0.002	ND	ND	ND - 0.001	ND	ND	ND	ND - 0.02
Spring No. 1	0.0084 - 0.016	ND	ND	ND - 0.002	ND - 0.002	ND	ND	ND - 0.06
Spring No. 2	0.0072 - 0.02	ND	ND - 0.005	ND - 0.002	ND - 0.001	ND - 0.0007	ND - 0.02	ND - 0.04
Spring No. 3	ND - 0.006	ND - 0.004	ND - 0.004	ND - 0.002	ND	ND - 0.001	ND - 0.003	ND - 0.03
Spring No. 4 (upper)	ND - 0.006	ND	ND - 0.006	ND - 0.003	ND - 0.001	ND - 0.0005	ND - 0.002	ND - 0.04
Spring No. 5	0.00344 - 0.014	ND	ND - 0.005	ND	ND - 0.002	ND - 0.0011	ND - 0.002	ND - 0.05
Warm Spring	0.0113 - 0.022	ND	ND	ND - 0.006	ND - 0.001	ND	ND	ND - 0.06
Ruby Valley Springs and Seeps								
Cherry Spring[4]	0.0089 - 0.0603	ND	ND	ND	ND	ND	ND - 0.001	ND - 0.012

Table B-4 Total Metals Ranges at Monitored Locations[1]

Site	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Zinc

[1] ND: not detected. Values are expressed as total recoverable concentrations.

[2] NAC 445A-1236, in milligrams per liter.

[3] Bold italicized values are discussed in the text.

[4] Sample from well at spring site.

Source: Tetra Tech 2011

Table B-5

Summary of Humidity Cell Test Results

Table B-5 Summary of Humidity Cell Test Results

Humidity Cell	Sample	Duration (weeks)	Rock Unit	Pit	ANP kg/t as $CaCO_3$	AGP kg/t as $CaCO_4$	NNP kg/t as $CaCO_5$	Last 5-week pH	Last 5-week Sulfate mg/kg	Cumulative Sulfate (mg/kg)	Cumulative SO_4-S / Total S (%)
Quarterly Composite Samples											
	Saga 6975	20	not reported	Saga	#N/A	#N/A	#N/A	7.40	3.90	57	#N/A
	Bida BWF Sed Ox	20	not reported	Bida	1.5	2.8	-1.3	7.93	1.60	28	18%
	Bida BWF Int Ox	22	not reported	Bida	0.3	4.1	-4.1	7.89	0.13	9	6%
	SWF-Sed-Ox 1st Qtr 2008	20	not reported	Saga	0.3	8.5	-8.5	8.04	3.82	89	32%
	SG-1054 195'-220'	117	not reported	Saga	5.8	10.1	-4.29	6.92	1.09	236	45%
	SG-1054 355'-380'	117	not reported	Saga	4.2	16.2	-12	6.14	0.43	53	8%
	SG-1009 50-100	115	not reported	Saga	7.3	5.78	1.52	8.01	0.55	86	70%
	SG-1043, 40-80	115	not reported	Saga	6.8	7.41	-0.61	7.24	0.47	84	29%
	B3WF-INT-OX	98	not reported	Bida	1.5	12.3	-10.8	6.99	0.54	118	46%
	SWF-SED-OX	98	not reported	Saga	3.5	3.94	-0.44	7.22	0.91	136	93%
	BWF_SED_OX (3rd 09)	73	not reported	Bida	509	0.3	508.7	8.57	1.60	65	100%
	BWF_INT_OX (4th 09)	57	not reported	Bida	4.4	5.3	-0.9	6.42	0.46	47	88%
	TWA1F_Sed_Ox	47	not reported	Top	3.9	5.2	-1.3	6.79	0.60	57	115%
	SA4_Sed_Ox (April 2011)	on-going	not reported	Sage	0.3	0.3	0	8.02	3.14	206	100%
Top Pit Samples											
3482-1	DT 05-01, 1000-1020	62		Top	1030	<0.3	1029.7	7.95	1	33	11%
3482-2	DT 05-01, 1020-1040	62		Top	1030	<0.3	1029.7	7.83	1	34	11%
3482-3	DT 05-03, 1144-1164	62		Top	811	<0.3	810.7	7.91	1	35	12%

Table B-5 Summary of Humidity Cell Test Results

Humidity Cell	Sample	Duration (weeks)	Rock Unit	Pit	ANP kg/t as $CaCO_3$	AGP kg/t as $CaCO_4$	NNP kg/t as $CaCO_5$	Last 5-week pH	Last 5-week Sulfate mg/kg	Cumulative Sulfate (mg/kg)	Cumulative SO_4-S / Total S (%)
3482-4	PZ-1007, 520-540	62		Top	542	<0.3	541.7	7.87	1	30	10%
3482-5	PZ-1008, 140-160	62		Top	518	<0.3	517.7	8.01	1	45	15%
3482-6	PZ-1008, 160-180	62		Top	721	<0.3	720.7	7.965	1	38	13%
3482-7	PZ-1008, 180-200	62		Top	947	<0.3	946.7	7.875	1	27	9%
3482-8	SF-1171, 20-40	62		Top	6.8	1.6	5.2	7.375	1.4	125	4%
3482-9	SF-1171, 80-100	62		Top	679	<0.3	678.7	7.58	1	65	4%
3482-10	SF-1171, 160-180	62		Top	929	<0.3	928.7	8.03	1	51	17%
3482-11	TD-1012, 63-83	62		Top	284	<0.3	283.7	7.995	1	52	17%
3482-12	TD-1012, 278-298	62		Top	837	<0.3	837	7.94	1	32	11%
3482-13	TD-1016, 262-282	62		Top	555	<0.3	555	8.035	1	30	10%
3482-14	TD-1016, 282-302	62		Top	153	<0.3	153	7.82	1	39	13%
3482-15	TD-1016, 302-322	62		Top	97.4	<0.3	97.4	7.77	1	57	10%
3482-16	TD-1082, 30-40	62		Top	658	<0.3	658	8.035	1	31	10%
3482-17	TD-1082, 40-50	62		Top	800	<0.3	800	7.75	1	37	12%
3482-18	TD-1175, 100-120	62		Top	437	<0.3	437	8.01	1	35	12%
3482-19	TOP PIT ALLUVIUM-1	62		Top	287	<0.3	287	7.97	1	43	7%
3482-20	TOP PIT ALLUVIUM-2	62		Top	263	<0.3	263	7.98	1	104	17%

Table B-5 Summary of Humidity Cell Test Results

Humidity Cell	Sample	Duration (weeks)	Rock Unit	Pit	ANP kg/t as $CaCO_3$	AGP kg/t as $CaCO_4$	NNP kg/t as $CaCO_5$	Last 5-week pH	Last 5-week Sulfate mg/kg	Cumulative Sulfate (mg/kg)	Cumulative SO_4-S / Total S (%)
3482-21	TOP PIT LAKE TOWN-1	62		Top	1030	<0.3	1030	7.495	1	26	9%
3482-22	TOP PIT LAKE TOWN-2	62		Top	1050	<0.3	1050	7.74	1	25	8%
Dominant Rock Units											
726-1	GX 1033 780-800	29	Pilot Shale	Galaxy	386.6	57.2	329.0	7.844	124.6	5,845	11%
726-2	GX 1033 800-820/960-980	29	Pilot Shale	Galaxy	476.8	35.4	441.0	7.622	196.2	7,538	22%
726-3	GX 1033 980-1000	29	Pilot Shale	Galaxy	510.3	35.2	475.0	9.106	36.4	2,912	9%
726-4	GX 1035 200-220	29	Pilot Shale	Galaxy	378.9	9.6	369.0	7.958	29.8	3,539	38%
726-5	GX 1035 640-660	29	Devils Gate/Guilmette LS	Galaxy	590.2	3.8	586.0	9.032	21.2	1,157	32%
726-6	GXD 1046 340-360	29	Pilot Shale	Galaxy	520.7	<0.3	521.0	8.036	12	1,473	100%
726-7	PZ 1013 200-220	29	Diamond Peak	Gator	5.7	17.4	-11.8	7.596	62.6	2,569	15%
726-8	PZ 1013 360-380	29	Diamond Peak	Gator	5.2	56.6	-51.4	2.72	248	10,664	20%
726-9	PZ 1013 680-700	29	Diamond Peak	Gator	213.9	22.7	191.0	8.046	39	2,021	9%
726-10	PZ 1016 200-220	29	Pilot Shale	Yankee	6.2	16.8	-10.6	7.722	9.8	345	2%
726-11	PZ 1016 380-400	29	Pilot Shale	Yankee	693.3	16	677.0	8.52	59.4	3,679	24%
726-38	VD05-09 320-	29	Pilot Shale	Vantage	<0.3	33.4	-33.4	2.59	290	28,020	87%

Table B-5 Summary of Humidity Cell Test Results

Humidity Cell	Sample	Duration (weeks)	Rock Unit	Pit	ANP kg/t as $CaCO_3$	AGP kg/t as $CaCO_4$	NNP kg/t as $CaCO_5$	Last 5-week pH	Last 5-week Sulfate mg/kg	Cumulative Sulfate (mg/kg)	Cumulative SO_4-S / Total S (%)
	340										
726-39	VD06-13 800-815	29	Devils Gate/Guilmette LS	Vantage	234.5	11	224.0	7.906	76.4	5,247	50%
726-40	VD06-13 815-835	29	Devils Gate/Guilmette LS	Vantage	247.4	32.1	215.0	7.832	88	4,964	16%
Redbird Samples											
726-12	PZ-1004 640-660	29	Pogonip	Red Bird	40.2	1.5	38.7	8.372	15	2,054	100%
726-13	PZ-1004 660-680	29	Pogonip	Red Bird	39.7	0.5	39.2	8.344	13	566	94%
726-14	PZ-1004 680-700	29	Pogonip	Red Bird	22.7	0.7	22.0	8.072	13.6	1,182	100%
726-15	PZ-1004 700-720	29	Pogonip	Red Bird	36.1	2	34.1	8.202	15.8	895	50%
726-16	PZ-1004 720-740	29	Pogonip	Red Bird	18	2.8	15.2	7.84	16.6	596	22%
726-17	PZ-1004 740-760	29	Jurassic	Red Bird	112.1	2.4	110.0	8.344	12.2	1,108	46%
726-18	RBD-1054 830-834	29	Pogonip	Red Bird	6.7	0.6	6.1	7.706	5	424	71%
726-19	RBD-1054 839-844	29	Jurassic	Red Bird	7.2	0.9	6.4	7.726	76	2,259	100%
726-20	RBD-1071 1020-1040	29	Jurassic	Red Bird	2.1	<0.3	2.1	7.772	7.8	830	100%
726-21	RBD-1078 180-200	29	Chainman	Red Bird	<0.3	16.9	-16.9	7.85	16.2	388	2%
726-22	RBD-1078 280-	29	Chainman	Red Bird	0.5	5.3	-4.8	7.902	26.8	611	12%

Table B-5 Summary of Humidity Cell Test Results

Humidity Cell	Sample	Duration (weeks)	Rock Unit	Pit	ANP kg/t as $CaCO_3$	AGP kg/t as $CaCO_4$	NNP kg/t as $CaCO_5$	Last 5-week pH	Last 5-week Sulfate mg/kg	Cumulative Sulfate (mg/kg)	Cumulative SO_4-S / Total S (%)
	300										
726-23	RBD-1078 360-380	29	Chainman	Red Bird	0.5	2.3	-1.8	7.898	9.2	1,062	51%
726-24	RBD-1088 1100-1120	29	Pogonip	Red Bird	3.6	<0.3	3.6	7.662	8.2	1,597	100%
726-25	RBD-1091 860-880	29	Jurassic	Red Bird	386.6	<0.3	387.0	8.026	3.2	241	80%
726-26	RBD-1092 500-520	29	Jurassic	Red Bird	1	1	0.3	7.554	8.6	841	93%
726-27	RBD-1092 600-620	29	Pogonip	Red Bird	791.3	<0.3	791.0	8.422	0.4	80	27%
726-28	RBD-1092 640-660	29	Pogonip	Red Bird	415	<0.3	415.0	8.244	1.4	97	32%
726-29	RBD-1107 800-820	29	Jurassic	Red Bird	505.2	<0.3	505.0	8.244	3.4	190	63%
726-30	RBD-1110 980-995	29	Jurassic	Red Bird	4.1	<0.3	4.0	7.658	7.2	454	100%
726-31	RBD-1120 385-387	29	Alluvium	Red Bird	42.8	0.4	42.4	8.02	1.8	197	66%
726-32	RBD-1131 580-595	29	Chainman	Red Bird	<0.3	80.5	-80.5	2.468	322	18,841	24%
726-33	RBD-1131 660-680	29	Chainman	Red Bird	<0.3	59	-59.0	2.602	290	16,957	30%
726-34	RBD-1131 780-795	29	Chainman	Red Bird	0.5	3.6	-3.1	7.092	4.2	274	8%
726-35	RBM OVBN-1	29	Alluvium	Red Bird	306.7	-0.8	308.0	8.154	7.4	516	57%
726-36	RBM OVBN-2	29	Alluvium	Red Bird	95.4	1.8	93.6	7.968	7.4	763	42%
726-37	RBM OVBN-3	29	Alluvium	Red Bird	358.3	-0.8	359.0	8.296	4.4	427	47%

Appendix C

Soils with Salvage Depths within the Study Area

Appendix C Soils with Salvage Depths within the Study Area

Mapunit Symbol	Mapunit Name	Component Name	Component %	Horizon Designation	Horizon Top depth	Horizon Bottom depth	Texture	pH	Soil Adsorption Ratio (SAR)	Electrical Conductivity (EC)	Water Erosion Potential	Wind Erosion Potential	Mapunit Acres	Component Acres	Slope	Geomorphic Description	Topsoil Suitability	Limiting Factors	Recommended Salvage Depth (RSD)
North Operations Area Project																			
100	Pookaloo-Cavehill-Rock outcrop association	Cavehill	30	H1	0	15	very gravelly silt loam	7.9-9	0-0	0-0	Severe	Moderate	895.18	268.56	15-50	mountains	Poor	C, D, DB, NR, OM, R, S	0
100	Pookaloo-Cavehill-Rock outcrop association	Cavehill	30	H2	15	27	very cobbly loam	7.9-9	0-0	0-2	Severe								
100	Pookaloo-Cavehill-Rock outcrop association	Cavehill	30	H3	27	31	unweathered bedrock	-	-	-									
100	Pookaloo-Cavehill-Rock outcrop association	Pookaloo	40	H1	0	4	very gravelly loam	7.9-8.4	0-0	0-0	Severe	Moderate		358.07	15-50	mountains	Poor	C, D, DB, NR, OM, R, S	0
100	Pookaloo-Cavehill-Rock outcrop association	Pookaloo	40	H2	4	19	very gravelly loam	7.9-8.4	0-0	0-0	Severe								
100	Pookaloo-Cavehill-Rock outcrop association	Pookaloo	40	H2	4	19	very gravelly loam	7.9-8.4	0-0	0-0	Severe								
100	Pookaloo-Cavehill-Rock outcrop association	Pookaloo	40	H3	19	23	unweathered bedrock	-	-	-									
1010	Hunnton-Chiara association	Chiara	35	H1	0	4	silt loam	6.6-8.4	0-5	0-2	Not Severe	Moderate	51.19	17.92	2-8	fan remnants	Poor	CL, D, E, OM, R, SC	4
1010	Hunnton-Chiara association	Chiara	35	H2	4	19	loam	7.4-9	5-30	0-4	Not Severe								
1010	Hunnton-Chiara association	Chiara	35	H3	19	23	indurated	-	-	-									
1010	Hunnton-Chiara association	Hunnton	50	H1	0	4	silt loam	7.4-8.4	0-5	0-4	Not Severe	Moderate		25.59	2-8	fan remnants	Poor	CL, D, E, OM, R, SC	10
1010	Hunnton-Chiara association	Hunnton	50	H2	4	10	clay loam	7.9-8.4	0-5	0-4	Not Severe								
1010	Hunnton-Chiara association	Hunnton	50	H3	10	35	clay	7.4-8.4	1-5	0-4	Not Severe								
1010	Hunnton-Chiara association	Hunnton	50	H4	35	40	indurated	-	-	-									
1081	Bobs-Fax-Parisa association	Bobs	40	H1	0	3	very gravelly loam	7.9-9	0-0	0-0	Not Severe	Moderate	327.81	131.12	2-15	fan remnants	Poor	C, D, E, OM, R, S, SC, StC	14
1081	Bobs-Fax-Parisa association	Bobs	40	H2	3	14	gravelly loam	7.9-9	1-5	0-2	Not Severe								
1081	Bobs-Fax-Parisa association	Bobs	40	H3	14	18	indurated	-	-	-									
1081	Bobs-Fax-Parisa association	Fax	25	H1	0	3	very cobbly coarse sandy loam	7.4-8.4	0-0	0-0	Not Severe	Moderate		81.95	4-15	fan remnants	Poor	C, D, E, OM, R, S, SC, StC	0
1081	Bobs-Fax-Parisa association	Fax	25	H2	3	12	very cobbly sandy clay loam	7.4-8.4	0-0	0-0	Not Severe								
1081	Bobs-Fax-Parisa association	Fax	25	H3	12	22	very cobbly coarse sandy loam	7.9-8.4	0-0	0-2	Not Severe								
1081	Bobs-Fax-Parisa association	Fax	25	H4	22	48	cemented	-	-	-									
1081	Bobs-Fax-Parisa association	Parisa	20	H1	0	4	gravelly loam	7.9-9	1-5	0-2	Not Severe	Moderate		65.56	2-8	fan remnants	Poor	C, D, E, OM, R, S, SC, StC	4
1081	Bobs-Fax-Parisa association	Parisa	20	H2	4	26	very gravelly loam	7.9-9	5-12	0-2	Not Severe								
1081	Bobs-Fax-Parisa association	Parisa	20	H3	26	47	indurated	-	-	-									
1081	Bobs-Fax-Parisa association	Parisa	20	H4	47	60	extremely gravelly coarse sandy loam	7.9-9	13-30	2-8	Not Severe								
1372	Wardbay-Hardol-Adobe association	Adobe	15	H1	0	5	very gravelly silt loam	7.9-8.4	0-0	0-0	Severe	Moderate	242.59	36.39	15-50	mountains	Poor	C, CC, D, DB, HR, R, S	0
1372	Wardbay-Hardol-Adobe association	Adobe	15	H2	5	17	very gravelly loam	7.9-8.4	0-0	0-0	Severe								
1372	Wardbay-Hardol-Adobe association	Adobe	15	H3	17	21	unweathered bedrock	-	-	-									
1372	Wardbay-Hardol-Adobe association	Cumulic Haplaquolls	2	H1	0	6	silt loam	8.5-9.6	0-0	4-8	Not Severe	Moderate		4.85	4-15	drainageways	Poor	C, CC, D, DB, HR, R, S	22
1372	Wardbay-Hardol-Adobe association	Cumulic Haplaquolls	2	H2	6	22	silt loam	8.5-9.6	0-0	4-8	Not Severe								
1372	Wardbay-Hardol-Adobe association	Cumulic Haplaquolls	2	H3	22	60	clay	8.5-9.6	0-0	4-8	Not Severe								
1372	Wardbay-Hardol-Adobe association	Hardol	30	H1	0	12	very gravelly silt loam	7.4-8.4	0-0	0-0	Severe	Moderate		72.78	15-30	mountains	Poor	C, CC, D, DB, HR, R, S	0
1372	Wardbay-Hardol-Adobe association	Hardol	30	H2	12	33	extremely gravelly silt loam	7.4-8.4	0-0	0-0	Not Severe								
1372	Wardbay-Hardol-Adobe association	Hardol	30	H3	33	60	extremely gravelly loam	7.9-8.4	0-0	0-0	Not Severe								
1372	Wardbay-Hardol-Adobe association	Wardbay	40	H1	0	18	very gravelly loam	7.4-8.4	0-0	0-0	Severe	Moderate		97.04	15-50	mountains	Poor	C, CC, D, DB, HR, R, S	0
1372	Wardbay-Hardol-Adobe association	Wardbay	40	H2	18	45	extremely cobbly silt loam	7.9-8.4	0-0	0-0	Severe								
1372	Wardbay-Hardol-Adobe association	Wardbay	40	H3	45	49	unweathered bedrock	-	-	-									
226	Hutchley-Tusel-Suak association	Devilsgait	1	H1	0	10	silt loam	7.9-8.4	1-5	0-2	Not Severe	Moderate	10.64	0.11	2-8	drainageways	Poor	CC, CL, D, DB, HR, NSL, OM, R, S	60

Appendix C Soils with Salvage Depths within the Study Area

Mapunit Symbol	Mapunit Name	Component Name	Component %	Horizon Designation	Horizon Top depth	Horizon Bottom depth	Texture	pH	Soil Adsorption Ratio (SAR)	Electrical Conductivity (EC)	Water Erosion Potential	Wind Erosion Potential	Mapunit Acres	Component Acres	Slope	Geomorphic Description	Topsoil Suitability	Limiting Factors	Recommended Salvage Depth (RSD)
226	Hutchley-Tusel-Suak association	Devilsgait	1	H2	10	60	silt loam to silty clay loam	7.9-8.4	1-5	0-2	Not Severe								
226	Hutchley-Tusel-Suak association	Hutchley	35	H1	0	3	very gravelly loam	6.6-7.8	0-0	0-0	Severe	Low		3.73	15-50	mountains	Poor	CC, CL, D, DB, HR, NSL, OM, R, S	0
226	Hutchley-Tusel-Suak association	Hutchley	35	H2	3	12	very cobbly clay loam	6.6-7.8	0-0	0-0	Severe								
226	Hutchley-Tusel-Suak association	Hutchley	35	H3	12	16	unweathered bedrock	-	-	-									
226	Hutchley-Tusel-Suak association	Suak	25	H1	0	10	very stony loam	6.6-7.3	0-0	0-0	Not Severe	Low		2.66	8-30	mountains	Poor	CC, CL, D, DB, HR, NSL, OM, R, S	0
226	Hutchley-Tusel-Suak association	Suak	25	H2	10	25	extremely cobbly loam	7.4-7.8	0-0	0-0	Not Severe								
226	Hutchley-Tusel-Suak association	Suak	25	H3	25	35	unweathered bedrock	-	-	-									
226	Hutchley-Tusel-Suak association	Tusel	25	H1	0	13	cobbly loam	6.1-7.3	0-0	0-0	Severe	Moderate		2.66	15-50	mountains	Poor	CC, CL, D, DB, HR, NSL, OM, R, S	13
226	Hutchley-Tusel-Suak association	Tusel	25	H2	13	42	extremely gravelly clay loam	6.1-7.3	0-0	0-0	Severe								
226	Hutchley-Tusel-Suak association	Tusel	25	H3	42	46	unweathered bedrock	-	-	-									
271	Atlow association	Atlow	20	H1	0	2	very gravelly loam	7.4-8.4	0-0	0-0	Not Severe	Low	3.96	0.79	4-15	mountains	Poor	CL, D, DB, OM, R, S	0
271	Atlow association	Atlow	20	H2	2	16	very cobbly clay loam	7.9-9	0-0	0-2	Not Severe								
271	Atlow association	Atlow	20	H3	16	20	unweathered bedrock	-	-	-									
271	Atlow association	Atlow	65	H1	0	2	very gravelly loam	7.4-8.4	0-0	0-0	Severe	Low		2.57	15-50	mountains	Poor	CL, D, DB, OM, R, S	0
271	Atlow association	Atlow	65	H2	2	16	very cobbly clay loam	7.9-9	0-0	0-2	Severe								
271	Atlow association	Atlow	65	H3	16	20	unweathered bedrock	-	-	-									
282	Palinor very gravelly loam, 2 to 15 percent slopes	Palinor	85	H1	0	10	very gravelly loam	7.9-9	1-5	0-0	Not Severe	Moderate	0.16	0.14	2-15	fan piedmonts, fan remnants	Poor	C, CP, D, R, S	0
282	Palinor very gravelly loam, 2 to 15 percent slopes	Palinor	85	H2	10	18	extremely gravelly fine sandy loam	7.9-9	1-5	2-4	Not Severe								
282	Palinor very gravelly loam, 2 to 15 percent slopes	Palinor	85	H3	18	30	cemented material	-	-	-									
282	Palinor very gravelly loam, 2 to 15 percent slopes	Palinor	85	H4	30	60	gravelly sandy loam to extremely gravelly coarse sand	7.9-9	1-12	0-0	Not Severe								
283	Palinor-Urmafot association	Palinor	65	H1	0	10	gravelly loam	7.9-9	1-5	0-0	Not Severe	Moderate	13.38	8.70	2-8	fan remnants	Poor	C, D, R, S	10
283	Palinor-Urmafot association	Palinor	65	H2	10	18	extremely gravelly fine sandy loam	7.9-9	1-5	2-4	Not Severe								
283	Palinor-Urmafot association	Palinor	65	H3	18	30	indurated	-	-	-									
283	Palinor-Urmafot association	Palinor	65	H4	30	60	gravelly sandy loam to extremely gravelly coarse sand	7.9-9	1-12	0-0	Not Severe								
283	Palinor-Urmafot association	Urmafot	20	H1	0	8	very gravelly loam	7.9-8.4	0-0	0-0	Not Severe	Moderate		2.68	4-15	fan remnants	Poor	C, D, R, S	0
283	Palinor-Urmafot association	Urmafot	20	H2	8	14	gravelly loam	7.9-8.4	0-0	0-0	Not Severe								
283	Palinor-Urmafot association	Urmafot	20	H3	14	32	indurated	-	-	-									
283	Palinor-Urmafot association	Urmafot	20	H4	32	60	extremely gravelly coarse sandy loam to extremely gravelly sandy loam	7.9-8.4	0-0	0-2	Not Severe								
290	Palinor-Shabliss-Tulase association	Palinor	45	H1	0	10	gravelly loam	7.9-9	1-5	0-0	Not Severe	Moderate	232.34	104.55	2-8	fan remnants	Poor	ALK, C, D, E, OM, R, SC	10
290	Palinor-Shabliss-Tulase association	Palinor	45	H2	10	18	extremely gravelly fine sandy loam	7.9-9	1-5	2-4	Not Severe								
290	Palinor-Shabliss-Tulase association	Palinor	45	H3	18	30	indurated	-	-	-									
290	Palinor-Shabliss-Tulase association	Palinor	45	H4	30	60	gravelly sandy loam to extremely gravelly coarse sand	7.9-9	1-12	0-0	Not Severe								
290	Palinor-Shabliss-Tulase association	Shabliss	25	H1	0	3	gravelly loam	7.9-8.4	1-5	0-4	Not Severe	Moderate		58.09	2-8	fan remnants	Poor	ALK, C, D, E, OM, R, SC	13
290	Palinor-Shabliss-Tulase association	Shabliss	25	H2	3	13	gravelly loam	7.9-8.4	1-12	0-4	Not Severe								
290	Palinor-Shabliss-Tulase association	Shabliss	25	H3	13	55	cemented	-	-	-									
290	Palinor-Shabliss-Tulase association	Tulase	20	H1	0	2	silt loam	7.9-8.4	0-0	0-2	Not Severe	Moderate		46.47	2-4	inset fans	Poor	ALK, C, D, E, OM, R, SC	60
290	Palinor-Shabliss-Tulase association	Tulase	20	H2	2	60	silt loam	8.5-9	1-5	0-2	Not Severe								

Appendix C Soils with Salvage Depths within the Study Area

Mapunit Symbol	Mapunit Name	Component Name	Component %	Horizon Designation	Horizon Top depth	Horizon Bottom depth	Texture	pH	Soil Adsorption Ratio (SAR)	Electrical Conductivity (EC)	Water Erosion Potential	Wind Erosion Potential	Mapunit Acres	Component Acres	Slope	Geomorphic Description	Topsoil Suitability	Limiting Factors	Recommended Salvage Depth (RSD)
291	Urmafot-Borvant-Biken association	Biken	15	H1	0	9	very gravelly fine sandy loam	8.5-9	0-0	0-0	Not Severe	Moderate	656.16	98.42	8-30	hills	Poor	ALK, C, D, DB, OM, R, S, SC, SD	0
291	Urmafot-Borvant-Biken association	Biken	15	H2	9	18	very gravelly fine sandy loam	8.5-9	1-12	0-0	Not Severe								
291	Urmafot-Borvant-Biken association	Biken	15	H3	18	30	weathered bedrock	-	-	-									
291	Urmafot-Borvant-Biken association	Biken	15	H4	30	40	unweathered bedrock	-	-	-									
291	Urmafot-Borvant-Biken association	Borvant	20	H1	0	2	gravelly loam	7.9-9	0-0	1-2	Not Severe	Moderate		131.23	4-15	fan remnants	Poor	ALK, C, D, DB, OM, R, S, SC, SD	2
291	Urmafot-Borvant-Biken association	Borvant	20	H2	2	19	extremely gravelly loam	8.5-9	0-0	0-2	Not Severe								
291	Urmafot-Borvant-Biken association	Borvant	20	H3	19	43	indurated	-	-	-									
291	Urmafot-Borvant-Biken association	Urmafot	50	H1	0	8	very gravelly loam	7.9-8.4	0-0	0-0	Not Severe	Moderate		328.08	2-8	fan remnants	Poor	ALK, C, D, DB, OM, R, S, SC, SD	8 to 14
291	Urmafot-Borvant-Biken association	Urmafot	50	H2	8	14	gravelly loam	7.9-8.4	0-0	0-0	Not Severe								
291	Urmafot-Borvant-Biken association	Urmafot	50	H3	14	32	indurated	-	-	-									
291	Urmafot-Borvant-Biken association	Urmafot	50	H4	32	60	extremely gravelly coarse sandy loam to extremely gravelly sandy loam	7.9-8.4	0-0	0-2	Not Severe								
480	Pioche-Cropper association	Cropper	35	H1	0	4	very cobbly loam	6.6-7.8	0-0	0-0	Severe	Low	20.38	7.13	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
480	Pioche-Cropper association	Cropper	35	H2	4	16	extremely gravelly clay loam	6.6-7.8	0-0	0-0	Severe								
480	Pioche-Cropper association	Cropper	35	H3	16	20	unweathered bedrock	-	-	-									
480	Pioche-Cropper association	Pioche	50	H1	0	3	extremely stony loam	6.6-7.8	0-0	0-0	Severe	Low		10.19	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
480	Pioche-Cropper association	Pioche	50	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Severe								
480	Pioche-Cropper association	Pioche	50	H3	15	19	unweathered bedrock	-	-	-									
481	Pioche-Segura-Cropper association	Cropper	15	H1	0	4	very cobbly loam	6.6-7.8	0-0	0-0	Not Severe	Low	121.47	18.22	8-30	mountains	Poor	CC, CL, D, DB, R, S, StC	0
481	Pioche-Segura-Cropper association	Cropper	15	H2	4	16	extremely gravelly clay loam	6.6-7.8	0-0	0-0	Not Severe								
481	Pioche-Segura-Cropper association	Cropper	15	H3	16	20	unweathered bedrock	-	-	-									
481	Pioche-Segura-Cropper association	Pioche	40	H1	0	3	extremely stony loam	6.6-7.8	0-0	0-0	Not Severe	Low		48.59	8-30	mountains	Poor	CC, CL, D, DB, R, S, StC	0
481	Pioche-Segura-Cropper association	Pioche	40	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Not Severe								
481	Pioche-Segura-Cropper association	Pioche	40	H3	15	19	unweathered bedrock	-	-	-									
481	Pioche-Segura-Cropper association	Segura	30	H1	0	3	very cobbly loam	6.6-8.4	0-0	0-0	Severe	Low		36.44	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
481	Pioche-Segura-Cropper association	Segura	30	H2	3	14	gravelly clay loam	6.6-8.4	0-0	0-0	Severe								
481	Pioche-Segura-Cropper association	Segura	30	H3	14	18	unweathered bedrock	-	-	-									
486	Pioche-Cropper-Upatad association	Cropper	20	H1	0	4	very cobbly loam	6.6-7.8	0-0	0-0	Severe	Low	203.91	40.78	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
486	Pioche-Cropper-Upatad association	Cropper	20	H2	4	16	extremely gravelly clay loam	6.6-7.8	0-0	0-0	Severe								
486	Pioche-Cropper-Upatad association	Cropper	20	H3	16	20	unweathered bedrock	-	-	-									
486	Pioche-Cropper-Upatad association	Pioche	50	H1	0	3	extremely stony loam	6.6-7.8	0-0	0-0	Severe	Low		101.96	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
486	Pioche-Cropper-Upatad association	Pioche	50	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Severe								
486	Pioche-Cropper-Upatad association	Pioche	50	H3	15	19	unweathered bedrock	-	-	-									
486	Pioche-Cropper-Upatad association	Upatad	20	H1	0	3	very gravelly silt loam	7.4-7.8	0-0	0-0	Severe	Low		40.78	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
486	Pioche-Cropper-Upatad association	Upatad	20	H2	3	15	very cobbly silty clay loam	7.4-8.4	0-0	0-0	Severe								
486	Pioche-Cropper-Upatad association	Upatad	20	H3	15	19	unweathered bedrock	-	-	-									
500	Segura-McIvey-Hutchley association	Hutchley	15	H1	0	3	very gravelly loam	6.6-7.8	0-0	0-0	Not Severe	Low	519.33	77.90	8-30	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
500	Segura-McIvey-Hutchley association	Hutchley	15	H2	3	12	very cobbly clay loam	6.6-7.8	0-0	0-0	Not Severe								
500	Segura-McIvey-Hutchley association	Hutchley	15	H3	12	16	unweathered bedrock	-	-	-									
500	Segura-McIvey-Hutchley association	McIvey	25	H1	0	12	very gravelly loam	6.6-7.3	0-0	0-0	Severe	Low		129.83	30-50	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	12 to 18
500	Segura-McIvey-Hutchley association	McIvey	25	H2	12	18	gravelly clay loam	6.1-7.3	0-0	0-0	Severe								

Appendix C Soils with Salvage Depths within the Study Area

Mapunit Symbol	Mapunit Name	Component Name	Component %	Horizon Designation	Horizon Top depth	Horizon Bottom depth	Texture	pH	Soil Adsorption Ratio (SAR)	Electrical Conductivity (EC)	Water Erosion Potential	Wind Erosion Potential	Mapunit Acres	Component Acres	Slope	Geomorphic Description	Topsoil Suitability	Limiting Factors	Recommended Salvage Depth (RSD)
500	Segura-McIvey-Hutchley association	McIvey	25	H3	18	62	extremely cobbly clay	6.1-7.3	0-0	0-0	Severe								
500	Segura-McIvey-Hutchley association	Segura	45	H1	0	3	very cobbly loam	6.6-8.4	0-0	0-0	Severe	Low		233.70	15-50	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
500	Segura-McIvey-Hutchley association	Segura	45	H2	3	14	gravelly clay loam	6.6-8.4	0-0	0-0	Severe								
500	Segura-McIvey-Hutchley association	Segura	45	H3	14	18	unweathered bedrock	-	-	-									
566	McIvey-Segura-Cropper association	Cropper	25	H1	0	4	very cobbly loam	6.6-7.8	0-0	0-0	Severe	Low	946.23	236.56	15-50	mountains	Poor	CL, D, DB, HR, OM, R, S	0
566	McIvey-Segura-Cropper association	Cropper	25	H2	4	16	extremely gravelly clay loam	6.6-7.8	0-0	0-0	Severe								
566	McIvey-Segura-Cropper association	Cropper	25	H3	16	20	unweathered bedrock	-	-	-									
566	McIvey-Segura-Cropper association	McIvey	30	H1	0	5	gravelly loam	6.6-7.3	0-0	0-0	Severe	Low		283.87	15-50	mountains	Poor	CL, D, DB, HR, OM, R, S	5
566	McIvey-Segura-Cropper association	McIvey	30	H2	5	12	very gravelly loam	6.6-7.3	0-0	0-0	Severe								
566	McIvey-Segura-Cropper association	McIvey	30	H3	12	18	gravelly clay loam	6.1-7.3	0-0	0-0	Severe								
566	McIvey-Segura-Cropper association	McIvey	30	H4	18	62	extremely cobbly clay	6.1-7.3	0-0	0-0	Severe								
566	McIvey-Segura-Cropper association	Segura	30	H1	0	3	very cobbly loam	6.6-8.4	0-0	0-0	Severe	Low		283.87	15-50	mountains	Poor	CL, D, DB, HR, OM, R, S	0
566	McIvey-Segura-Cropper association	Segura	30	H2	3	14	gravelly clay loam	6.6-8.4	0-0	0-0	Severe								
566	McIvey-Segura-Cropper association	Segura	30	H3	14	18	unweathered bedrock	-	-	-									
670	Cavehill-Grink-Rock outcrop association	Cavehill	45	H1	0	15	very gravelly silt loam	7.9-9	0-0	0-0	Severe	Moderate	153.21	68.94	15-50	mountains	Poor	C, D, DB, NR, R, S, StC	0
670	Cavehill-Grink-Rock outcrop association	Cavehill	45	H2	15	27	very cobbly loam	7.9-9	0-0	0-2	Severe								
670	Cavehill-Grink-Rock outcrop association	Cavehill	45	H3	27	31	unweathered bedrock	-	-	-									
670	Cavehill-Grink-Rock outcrop association	Grink	30	H1	0	7	very stony loam	7.4-8.4	0-0	0-0	Severe	Low		45.96	15-50	mountains	Poor	C, D, DB, NR, R, S, StC	0
670	Cavehill-Grink-Rock outcrop association	Grink	30	H2	7	19	very gravelly fine sandy loam	7.4-8.4	0-0	0-0	Severe								
670	Cavehill-Grink-Rock outcrop association	Grink	30	H3	19	29	unweathered bedrock	-	-	-									
753	Upatad-Cropper-Atlow association	Atlow	15	H1	0	2	very gravelly loam	7.4-8.4	0-0	0-0	Severe	Low	1.70	0.26	15-50	mountains	Poor	CL, D, DB, OM, R, S	0
753	Upatad-Cropper-Atlow association	Atlow	15	H2	2	16	very cobbly clay loam	7.9-9	0-0	0-2	Severe								
753	Upatad-Cropper-Atlow association	Atlow	15	H3	16	20	unweathered bedrock	-	-	-									
753	Upatad-Cropper-Atlow association	Cropper	30	H1	0	4	very cobbly loam	6.6-7.8	0-0	0-0	Severe	Low		0.51	15-50	mountains	Poor	CL, D, DB, OM, R, S	0
753	Upatad-Cropper-Atlow association	Cropper	30	H2	4	16	extremely gravelly clay loam	6.6-7.8	0-0	0-0	Severe								
753	Upatad-Cropper-Atlow association	Cropper	30	H3	16	20	unweathered bedrock	-	-	-									
753	Upatad-Cropper-Atlow association	Upatad	40	H1	0	3	very gravelly silt loam	7.4-7.8	0-0	0-0	Severe	Low		0.68	15-50	mountains	Poor	CL, D, DB, OM, R, S	0
753	Upatad-Cropper-Atlow association	Upatad	40	H2	3	15	very cobbly silty clay loam	7.4-8.4	0-0	0-0	Severe								
753	Upatad-Cropper-Atlow association	Upatad	40	H3	15	19	unweathered bedrock	-	-	-									
763	Segura-Pioche-McIvey association	McIvey	20	H1	0	5	gravelly loam	6.6-7.3	0-0	0-0	Not Severe	Low	285.12	57.02	4-15	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	5
763	Segura-Pioche-McIvey association	McIvey	20	H2	5	12	very gravelly loam	6.6-7.3	0-0	0-0	Not Severe								
763	Segura-Pioche-McIvey association	McIvey	20	H3	12	18	gravelly clay loam	6.1-7.3	0-0	0-0	Not Severe								
763	Segura-Pioche-McIvey association	McIvey	20	H3	12	18	gravelly clay loam	6.1-7.3	0-0	0-0	Not Severe								
763	Segura-Pioche-McIvey association	McIvey	20	H4	18	62	extremely cobbly clay	6.1-7.3	0-0	0-0	Not Severe								
763	Segura-Pioche-McIvey association	Pioche	30	H1	0	3	extremely stony loam	6.6-7.8	0-0	0-0	Severe	Low		85.54	15-50	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
763	Segura-Pioche-McIvey association	Pioche	30	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Severe								
763	Segura-Pioche-McIvey association	Pioche	30	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Severe								
763	Segura-Pioche-McIvey association	Pioche	30	H3	15	19	unweathered bedrock	-	-	-									
763	Segura-Pioche-McIvey association	Segura	35	H1	0	3	very cobbly loam	6.6-8.4	0-0	0-0	Not Severe	Low		99.79	8-30	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
763	Segura-Pioche-McIvey association	Segura	35	H2	3	14	gravelly clay loam	6.6-8.4	0-0	0-0	Not Severe								

Appendix C Soils with Salvage Depths within the Study Area

Mapunit Symbol	Mapunit Name	Component Name	Component %	Horizon Designation	Horizon Top depth	Horizon Bottom depth	Texture	pH	Soil Adsorption Ratio (SAR)	Electrical Conductivity (EC)	Water Erosion Potential	Wind Erosion Potential	Mapunit Acres	Component Acres	Slope	Geomorphic Description	Topsoil Suitability	Limiting Factors	Recommended Salvage Depth (RSD)
763	Segura-Pioche-McIvey association	Segura	35	H3	14	18	unweathered bedrock	-	-	-									
801	Broland very gravelly loam, 4 to 8 percent slopes	Broland	100	H1	0	3	very gravelly loam	7.9-8.4	0-0	0-2	Not Severe	Low	193.86	193.86	4-8	fan remnants	Poor	D, OM, R	3 to 9
801	Broland very gravelly loam, 4 to 8 percent slopes	Broland	100	H2	3	9	gravelly clay loam	7.9-8.4	0-0	0-2	Not Severe								
801	Broland very gravelly loam, 4 to 8 percent slopes	Broland	100	H3	9	16	extremely gravelly clay loam	7.9-8.4	1-5	0-2	Not Severe								
801	Broland very gravelly loam, 4 to 8 percent slopes	Broland	100	H4	16	19	extremely gravelly sandy loam	7.9-8.4	1-5	0-2	Not Severe								
801	Broland very gravelly loam, 4 to 8 percent slopes	Broland	100	H5	19	40	cemented	-	-	-									
801	Broland very gravelly loam, 4 to 8 percent slopes	Broland	100	H6	40	60	extremely gravelly coarse sand	7.9-8.4	1-5	0-2	Not Severe								
920	Abgese-Yody-Shabliss association	Abgese	45	H1	0	4	sandy loam	7.9-8.4	1-5	0-2	Not Severe	Moderate	1.37	0.62	2-4	fan remnants	Poor	ALK, D, E, HR, OM, R, SC	22
920	Abgese-Yody-Shabliss association	Abgese	45	H2	4	22	gravelly sandy clay loam	7.9-8.4	1-5	0-2	Not Severe								
920	Abgese-Yody-Shabliss association	Abgese	45	H3	22	43	very gravelly sandy loam	7.9-8.4	1-5	0-2	Not Severe								
920	Abgese-Yody-Shabliss association	Abgese	45	H4	43	60	very gravelly loamy sand	8.5-9	1-5	2-4	Not Severe								
920	Abgese-Yody-Shabliss association	Shabliss	20	H1	0	3	gravelly loam	7.9-8.4	1-5	0-4	Not Severe	Moderate		0.27	2-4	fan remnants	Poor	ALK, D, E, HR, OM, R, SC	13
920	Abgese-Yody-Shabliss association	Shabliss	20	H2	3	13	gravelly loam	7.9-8.4	1-12	0-4	Not Severe								
920	Abgese-Yody-Shabliss association	Shabliss	20	H3	13	55	cemented	-	-	-									
920	Abgese-Yody-Shabliss association	Yody	20	H1	0	4	gravelly sandy loam	7.9-8.4	0-5	0-2	Not Severe	Moderate		0.27	2-4	fan remnants	Poor	ALK, D, E, HR, OM, R, SC	36
920	Abgese-Yody-Shabliss association	Yody	20	H2	4	30	gravelly clay loam	7.9-8.4	1-12	2-4	Not Severe								
920	Abgese-Yody-Shabliss association	Yody	20	H3	30	36	gravelly loam	7.9-9	1-12	2-4	Not Severe								
920	Abgese-Yody-Shabliss association	Yody	20	H4	36	60	cemented	-	-	-									
South Operations Area Project																			
100	Pookaloo-Cavehill-Rock outcrop association	Cavehill	30	H1	0	15	very gravelly silt loam	7.9-9	0-0	0-0	Severe	Moderate	40.65	12.20	15-50	mountains	Poor	C, D, DB, NR, OM, R, S	0
100	Pookaloo-Cavehill-Rock outcrop association	Cavehill	30	H2	15	27	very cobbly loam	7.9-9	0-0	0-2	Severe								
100	Pookaloo-Cavehill-Rock outcrop association	Cavehill	30	H3	27	31	unweathered bedrock	-	-	-									
100	Pookaloo-Cavehill-Rock outcrop association	Pookaloo	40	H1	0	4	very gravelly loam	7.9-8.4	0-0	0-0	Severe	Moderate		16.26	15-50	mountains	Poor	C, D, DB, NR, OM, R, S	0
100	Pookaloo-Cavehill-Rock outcrop association	Pookaloo	40	H2	4	19	very gravelly loam	7.9-8.4	0-0	0-0	Severe								
100	Pookaloo-Cavehill-Rock outcrop association	Pookaloo	40	H3	19	23	unweathered bedrock	-	-	-									
120	Tecomar-Pookaloo-Zimbob association	Pookaloo	20	H1	0	4	very gravelly loam	7.9-8.4	0-0	0-0	Severe	Moderate	51.43	10.29	15-50	mountains	Poor	C, CC, D, DB, OM, R, S	0
120	Tecomar-Pookaloo-Zimbob association	Pookaloo	20	H2	4	19	very gravelly loam	7.9-8.4	0-0	0-0	Severe								
120	Tecomar-Pookaloo-Zimbob association	Pookaloo	20	H3	19	23	unweathered bedrock	-	-	-									
120	Tecomar-Pookaloo-Zimbob association	Tecomar	50	H1	0	3	extremely gravelly silt loam	7.9-9	0-0	0-2	Severe	Low		25.71	15-50	mountains	Poor	C, CC, D, DB, OM, R, S	0
120	Tecomar-Pookaloo-Zimbob association	Tecomar	50	H2	3	18	extremely cobbly silt loam	7.9-9	1-5	0-2	Severe								
120	Tecomar-Pookaloo-Zimbob association	Tecomar	50	H3	18	22	unweathered bedrock	-	-	-									
120	Tecomar-Pookaloo-Zimbob association	Zimbob	15	H1	0	1	very gravelly loam	7.9-8.4	1-5	0-0	Severe	Moderate		7.71	15-50	hills	Poor	C, CC, D, DB, OM, R, S	0
120	Tecomar-Pookaloo-Zimbob association	Zimbob	15	H2	1	12	very gravelly loam	7.9-9	1-5	0-0	Severe								
120	Tecomar-Pookaloo-Zimbob association	Zimbob	15	H3	12	16	unweathered bedrock	-	-	-									
1260	Urmafot association	Urmafot	15	H1	0	9	very gravelly loam	7.9-8.4	0-0	0-0	Not Severe	Moderate	35.85	5.38	4-15	fan remnants	Poor	C, D, R, S	0
1260	Urmafot association	Urmafot	15	H2	9	32	gravelly loam	-	-	-									

Appendix C Soils with Salvage Depths within the Study Area

Mapunit Symbol	Mapunit Name	Component Name	Component %	Horizon Designation	Horizon Top depth	Horizon Bottom depth	Texture	pH	Soil Adsorption Ratio (SAR)	Electrical Conductivity (EC)	Water Erosion Potential	Wind Erosion Potential	Mapunit Acres	Component Acres	Slope	Geomorphic Description	Topsoil Suitability	Limiting Factors	Recommended Salvage Depth (RSD)
1260	Urmafot association	Urmafot	15	H4	32	60	extremely gravelly coarse sandy loam to extremely gravelly sandy loam	7.9-8.4	0-0	0-2	Not Severe								
1260	Urmafot association	Urmafot	70	H1	0	8	very gravelly loam	7.9-8.4	0-0	0-0	Not Severe	Moderate		25.09	4-15	fan remnants	Poor	C, D, R, S	8 to 14
1260	Urmafot association	Urmafot	70	H2	8	14	gravelly loam	7.9-8.4	0-0	0-0	Not Severe								
1260	Urmafot association	Urmafot	70	H3	14	32	indurated	-	-	-									
1260	Urmafot association	Urmafot	70	H4	32	60	extremely gravelly coarse sandy loam to extremely gravelly sandy loam	7.9-8.4	0-0	0-2	Not Severe								
271	Atlow association	Atlow	20	H1	0	2	very gravelly loam	7.4-8.4	0-0	0-0	Not Severe	Low	24.11	4.82	4-15	mountains	Poor	CL, D, DB, OM, R, S	0
271	Atlow association	Atlow	20	H2	2	16	very cobbly clay loam	7.9-9	0-0	0-2	Not Severe								
271	Atlow association	Atlow	20	H3	16	20	unweathered bedrock	-	-	-									
271	Atlow association	Atlow	65	H1	0	2	very gravelly loam	7.4-8.4	0-0	0-0	Severe	Low		15.67	15-50	mountains	Poor	CL, D, DB, OM, R, S	0
271	Atlow association	Atlow	65	H2	2	16	very cobbly clay loam	7.9-9	0-0	0-2	Severe								
271	Atlow association	Atlow	65	H3	16	20	unweathered bedrock	-	-	-									
288	Palinor-Yody-Broland association	Broland	20	H1	0	3	very gravelly loam	7.9-8.4	0-0	0-2	Not Severe	Low	212.62	42.52	4-15	fan remnants	Poor	C, CP, D, OM, R, S, SC	3 to 9
288	Palinor-Yody-Broland association	Broland	20	H2	3	9	gravelly clay loam	7.9-8.4	0-0	0-2	Not Severe								
288	Palinor-Yody-Broland association	Broland	20	H3	9	16	extremely gravelly clay loam	7.9-8.4	1-5	0-2	Not Severe								
288	Palinor-Yody-Broland association	Broland	20	H4	16	19	extremely gravelly sandy loam	7.9-8.4	1-5	0-2	Not Severe								
288	Palinor-Yody-Broland association	Broland	20	H5	19	40	cemented material	-	-	-									
288	Palinor-Yody-Broland association	Broland	20	H6	40	60	extremely gravelly coarse sand	7.9-8.4	1-5	0-2	Not Severe								
288	Palinor-Yody-Broland association	Palinor	40	H1	0	10	gravelly loam	7.9-9	1-5	0-0	Not Severe	Moderate		85.05	2-8	fan piedmonts, fan remnants	Poor	C, CP, D, OM, R, S, SC	10
288	Palinor-Yody-Broland association	Palinor	40	H2	10	18	extremely gravelly fine sandy loam	7.9-9	1-5	2-4	Not Severe								
288	Palinor-Yody-Broland association	Palinor	40	H3	18	30	cemented material	-	-	-									
288	Palinor-Yody-Broland association	Palinor	40	H4	30	60	gravelly sandy loam to extremely gravelly coarse sand	7.9-9	1-12	0-0	Not Severe								
288	Palinor-Yody-Broland association	Yody	25	H1	0	4	gravelly sandy loam	7.9-8.4	0-5	0-2	Not Severe	Moderate		53.15	2-8	fan remnants	Poor	C, CP, D, OM, R, S, SC	36
288	Palinor-Yody-Broland association	Yody	25	H2	4	30	gravelly clay loam	7.9-8.4	1-12	2-4	Not Severe								
288	Palinor-Yody-Broland association	Yody	25	H2	4	30	gravelly clay loam	7.9-8.4	1-12	2-4	Not Severe								
288	Palinor-Yody-Broland association	Yody	25	H3	30	36	gravelly loam	7.9-9	1-12	2-4	Not Severe								
288	Palinor-Yody-Broland association	Yody	25	H4	36	60	cemented material	-	-	-									
292	Palinor-Urmafot-Urmafot, very shallow association	Palinor	45	H1	0	10	gravelly loam	7.9-9	1-5	0-0	Not Severe	Moderate	47.39	21.33	8-15	fan remnants	Poor	C, D, R, S	10
292	Palinor-Urmafot-Urmafot, very shallow association	Palinor	45	H2	10	18	extremely gravelly fine sandy loam	7.9-9	1-5	2-4	Not Severe								
292	Palinor-Urmafot-Urmafot, very shallow association	Palinor	45	H3	18	30	indurated	-	-	-									
292	Palinor-Urmafot-Urmafot, very shallow association	Palinor	45	H4	30	60	gravelly sandy loam to extremely gravelly coarse sand	7.9-9	1-12	0-0	Not Severe								
292	Palinor-Urmafot-Urmafot, very shallow association	Urmafot	15	H1	0	9	very gravelly loam	7.9-8.4	0-0	0-0	Not Severe	Moderate		7.11	4-15	fan remnants	Poor	C, D, R, S	9 to 32
292	Palinor-Urmafot-Urmafot, very shallow association	Urmafot	15	H2	9	32	gravelly loam	-	-	-									
292	Palinor-Urmafot-Urmafot, very shallow association	Urmafot	15	H4	32	60	extremely gravelly coarse sandy loam to extremely gravelly sandy loam	7.9-8.4	0-0	0-2	Not Severe								
292	Palinor-Urmafot-Urmafot, very shallow association	Urmafot	25	H1	0	8	very gravelly loam	7.9-8.4	0-0	0-0	Not Severe	Moderate		11.85	2-8	fan remnants	Poor	C, D, R, S	8 to 14
292	Palinor-Urmafot-Urmafot, very shallow association	Urmafot	25	H2	8	14	gravelly loam	7.9-8.4	0-0	0-0	Not Severe								
292	Palinor-Urmafot-Urmafot, very shallow association	Urmafot	25	H3	14	32	indurated	-	-	-									

Appendix C Soils with Salvage Depths within the Study Area

Mapunit Symbol	Mapunit Name	Component Name	Component %	Horizon Designation	Horizon Top depth	Horizon Bottom depth	Texture	pH	Soil Adsorption Ratio (SAR)	Electrical Conductivity (EC)	Water Erosion Potential	Wind Erosion Potential	Mapunit Acres	Component Acres	Slope	Geomorphic Description	Topsoil Suitability	Limiting Factors	Recommended Salvage Depth (RSD)
292	Palinor-Urmafot-Urmafot, very shallow association	Urmafot	25	H4	32	60	extremely gravelly coarse sandy loam to extremely gravelly sandy loam	7.9-8.4	0-0	0-2	Not Severe								
296	Palinor-Urmafot-Palinor, steep association	Palinor	15	H1	0	10	gravelly loam	7.9-9	1-5	0-0	Severe	Moderate	63.06	9.46	15-50	fan remnants	Poor	C, D, R, S	10
296	Palinor-Urmafot-Palinor, steep association	Palinor	15	H2	10	18	extremely gravelly fine sandy loam	7.9-9	1-5	2-4	Severe								
296	Palinor-Urmafot-Palinor, steep association	Palinor	15	H3	18	30	indurated	-	-	-									
296	Palinor-Urmafot-Palinor, steep association	Palinor	15	H4	30	60	gravelly sandy loam to extremely gravelly coarse sand	7.9-9	1-12	0-0	Severe								
296	Palinor-Urmafot-Palinor, steep association	Palinor	50	H1	0	10	gravelly loam	7.9-9	1-5	0-0	Not Severe	Moderate		31.53	4-15	fan remnants	Poor	C, D, R, S	10
296	Palinor-Urmafot-Palinor, steep association	Palinor	50	H2	10	18	extremely gravelly fine sandy loam	7.9-9	1-5	2-4	Not Severe								
296	Palinor-Urmafot-Palinor, steep association	Palinor	50	H3	18	30	indurated	-	-	-									
296	Palinor-Urmafot-Palinor, steep association	Palinor	50	H4	30	60	gravelly sandy loam to extremely gravelly coarse sand	7.9-9	1-12	0-0	Not Severe								
296	Palinor-Urmafot-Palinor, steep association	Urmafot	20	H1	0	8	very gravelly loam	7.9-8.4	0-0	0-0	Not Severe	Moderate		12.61	4-15	fan remnants	Poor	C, D, R, S	8 to 14
296	Palinor-Urmafot-Palinor, steep association	Urmafot	20	H2	8	14	gravelly loam	7.9-8.4	0-0	0-0	Not Severe								
296	Palinor-Urmafot-Palinor, steep association	Urmafot	20	H3	14	32	indurated	-	-	-									
296	Palinor-Urmafot-Palinor, steep association	Urmafot	20	H4	32	60	extremely gravelly coarse sandy loam to extremely gravelly sandy loam	7.9-8.4	0-0	0-2	Not Severe								
326	Palinor-Urmafot-Roden association	Palinor	35	H1	0	10	gravelly loam	7.9-9	1-5	0-0	Not Severe	Moderate	378.79	132.58	2-8	fan remnants	Poor	C, CL, D, DB, OM, R, S	10
326	Palinor-Urmafot-Roden association	Palinor	35	H2	10	18	extremely gravelly fine sandy loam	7.9-9	1-5	2-4	Not Severe								
326	Palinor-Urmafot-Roden association	Palinor	35	H3	18	30	indurated	-	-	-									
326	Palinor-Urmafot-Roden association	Palinor	35	H4	30	60	gravelly sandy loam to extremely gravelly coarse sand	7.9-9	1-12	0-0	Not Severe								
326	Palinor-Urmafot-Roden association	Roden	20	H1	0	1	very gravelly clay loam	7.9-8.4	0-0	0-0	Not Severe	Moderate		75.76	4-15	hills	Poor	C, CL, D, DB, OM, R, S	0
326	Palinor-Urmafot-Roden association	Roden	20	H2	1	8	very gravelly clay	7.9-8.4	0-0	0-0	Not Severe								
326	Palinor-Urmafot-Roden association	Roden	20	H3	8	12	weathered bedrock	-	-	-									
326	Palinor-Urmafot-Roden association	Urmafot	30	H1	0	9	gravelly loam	7.9-8.4	0-0	0-0	Not Severe	Moderate		113.64	2-8	fan remnants	Poor	C, CL, D, DB, OM, R, S	9
326	Palinor-Urmafot-Roden association	Urmafot	30	H2	9	32	indurated	-	-	-									
326	Palinor-Urmafot-Roden association	Urmafot	30	H4	32	60	extremely gravelly coarse sandy loam to extremely gravelly sandy loam	7.9-8.4	0-0	0-2	Not Severe								
351	Heist-Tulase association	Heist	60	H1	0	3	silt loam	7.9-8.4	1-5	0-2	Not Severe	Moderate	13.29	7.98	0-2	fan skirts	Fair	ALK, E, HR, OM, R, SC, SD	60
351	Heist-Tulase association	Heist	60	H2	3	36	fine sandy loam	7.9-9	5-12	2-4	Not Severe								
351	Heist-Tulase association	Heist	60	H2	3	36	fine sandy loam	7.9-9	5-12	2-4	Not Severe								
351	Heist-Tulase association	Heist	60	H3	36	60	gravelly fine sandy loam	7.9-9	5-12	2-4	Not Severe								
351	Heist-Tulase association	Tulase	30	H1	0	2	silt loam	7.9-8.4	0-0	0-2	Not Severe	Moderate		3.99	0-2	inset fans	Fair	ALK, E, HR, OM, R, SC, SD	60
351	Heist-Tulase association	Tulase	30	H2	2	60	silt loam	8.5-9	1-5	0-2	Not Severe								
480	Pioche-Cropper association	Cropper	35	H1	0	4	very cobbly loam	6.6-7.8	0-0	0-0	Severe	Low	38.67	13.54	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
480	Pioche-Cropper association	Cropper	35	H2	4	16	extremely gravelly clay loam	6.6-7.8	0-0	0-0	Severe								
480	Pioche-Cropper association	Cropper	35	H3	16	20	unweathered bedrock	-	-	-									
480	Pioche-Cropper association	Pioche	50	H1	0	3	extremely stony loam	6.6-7.8	0-0	0-0	Severe	Low		19.34	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
480	Pioche-Cropper association	Pioche	50	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Severe								

Appendix C Soils with Salvage Depths within the Study Area

Mapunit Symbol	Mapunit Name	Component Name	Component %	Horizon Designation	Horizon Top depth	Horizon Bottom depth	Texture	pH	Soil Adsorption Ratio (SAR)	Electrical Conductivity (EC)	Water Erosion Potential	Wind Erosion Potential	Mapunit Acres	Component Acres	Slope	Geomorphic Description	Topsoil Suitability	Limiting Factors	Recommended Salvage Depth (RSD)
480	Pioche-Cropper association	Pioche	50	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Severe								
480	Pioche-Cropper association	Pioche	50	H3	15	19	unweathered bedrock	-	-	-									
481	Pioche-Segura-Cropper association	Cropper	15	H1	0	4	very cobbly loam	6.6-7.8	0-0	0-0	Not Severe	Low	520.96	78.14	8-30	mountains	Poor	CC, CL, D, DB, R, S, StC	0
481	Pioche-Segura-Cropper association	Cropper	15	H2	4	16	extremely gravelly clay loam	6.6-7.8	0-0	0-0	Not Severe								
481	Pioche-Segura-Cropper association	Cropper	15	H3	16	20	unweathered bedrock	-	-	-									
481	Pioche-Segura-Cropper association	Pioche	40	H1	0	3	extremely stony loam	6.6-7.8	0-0	0-0	Not Severe	Low		208.39	8-30	mountains	Poor	CC, CL, D, DB, R, S, StC	0
481	Pioche-Segura-Cropper association	Pioche	40	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Not Severe								
481	Pioche-Segura-Cropper association	Pioche	40	H3	15	19	unweathered bedrock	-	-	-									
481	Pioche-Segura-Cropper association	Segura	30	H1	0	3	very cobbly loam	6.6-8.4	0-0	0-0	Severe	Low		156.29	15-50	mountains	Poor	CC, CL, D, DB, R, S, StC	0
481	Pioche-Segura-Cropper association	Segura	30	H2	3	14	gravelly clay loam	6.6-8.4	0-0	0-0	Severe								
481	Pioche-Segura-Cropper association	Segura	30	H3	14	18	unweathered bedrock	-	-	-									
561	McIvey-Pioche-Upatad association	McIvey	40	H1	0	12	very gravelly loam	6.6-7.3	0-0	0-0	Severe	Low	81.98	32.79	15-50	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
561	McIvey-Pioche-Upatad association	McIvey	40	H2	12	18	gravelly clay loam	6.1-7.3	0-0	0-0	Severe								
561	McIvey-Pioche-Upatad association	McIvey	40	H3	18	62	extremely cobbly clay	6.1-7.3	0-0	0-0	Severe								
561	McIvey-Pioche-Upatad association	Pioche	25	H1	0	3	extremely stony loam	6.6-7.8	0-0	0-0	Severe	Low		20.50	15-50	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
561	McIvey-Pioche-Upatad association	Pioche	25	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Severe								
561	McIvey-Pioche-Upatad association	Pioche	25	H3	15	19	unweathered bedrock	-	-	-									
561	McIvey-Pioche-Upatad association	Upatad	20	H1	0	3	very gravelly silt loam	7.4-7.8	0-0	0-0	Severe	Low		16.40	15-50	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
561	McIvey-Pioche-Upatad association	Upatad	20	H2	3	15	very cobbly silty clay loam	7.4-8.4	0-0	0-0	Severe								
561	McIvey-Pioche-Upatad association	Upatad	20	H3	15	19	unweathered bedrock	-	-	-									
763	Segura-Pioche-McIvey association	McIvey	20	H1	0	5	gravelly loam	6.6-7.3	0-0	0-0	Not Severe	Low	627.20	125.44	4-15	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	5
763	Segura-Pioche-McIvey association	McIvey	20	H2	5	12	very gravelly loam	6.6-7.3	0-0	0-0	Not Severe								
763	Segura-Pioche-McIvey association	McIvey	20	H3	12	18	gravelly clay loam	6.1-7.3	0-0	0-0	Not Severe								
763	Segura-Pioche-McIvey association	McIvey	20	H4	18	62	extremely cobbly clay	6.1-7.3	0-0	0-0	Not Severe								
763	Segura-Pioche-McIvey association	Pioche	30	H1	0	3	extremely stony loam	6.6-7.8	0-0	0-0	Severe	Low		188.16	15-50	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
763	Segura-Pioche-McIvey association	Pioche	30	H2	3	15	very cobbly clay	6.6-7.8	0-0	0-0	Severe								
763	Segura-Pioche-McIvey association	Pioche	30	H3	15	19	unweathered bedrock	-	-	-									
763	Segura-Pioche-McIvey association	Segura	35	H1	0	3	very cobbly loam	6.6-8.4	0-0	0-0	Not Severe	Low		219.52	8-30	mountains	Poor	CC, CL, D, DB, HR, OM, R, S, StC	0
763	Segura-Pioche-McIvey association	Segura	35	H2	3	14	gravelly clay loam	6.6-8.4	0-0	0-0	Not Severe								
763	Segura-Pioche-McIvey association	Segura	35	H3	14	18	unweathered bedrock	-	-	-									

Appendix D

Inventory of Migratory and Resident Bird Species Potentially Occurring within the Study Area

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Appendix D Inventory of Migratory and Resident Bird Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status[1]	Observed in Study Area[2]
American crow	*Corvus brachyrhynchos*	-	Yes
American kestrel	*Falco sparverius*	-	No
American robin	*Turdus migratorius*	-	Yes
Ash-throated flycatcher	*Myiarchus cinerascens*	PIF	Yes
Barn swallow	*Hirundo rustica*	-	Yes
Black-billed magpie	*Pica pica*	-	Yes
Black-headed grosbeak	*Pheucticus melanocephalus*	-	Yes
Black rosy-finch	*Leucosticte atrata*	BLM, BCC, PIF	No
Black-throated gray warbler	*Dendroica nigrescens*	PIF	Yes
Black-throated sparrow	*Amphispiza bilineata*	-	Yes
Blue-gray gnatcatcher	*Polioptila caerulea*	-	Yes
Brewer’s blackbird	*Euphagus cyanocephalus*	-	Yes
Brewer’s sparrow	*Spizella breweri*	BCC	Yes
Broad-tailed hummingbird	*Selasphorus platycercus*	-	Yes
Brown-headed cowbird	*Molothrus ater*	-	No
Bullock’s oriole	*Icterus bullockii*	-	Yes
Bushtit	*Psaltriparus minimus*	-	Yes
Cassin’s finch	*Carpodacus cassinii*	-	Yes
Chipping sparrow	*Spizella passerina*	-	Yes
Chukar	*Alectoris chukar*	-	Yes
Clark’s nutcracker	*Nucifraga columbiana*	-	Yes
Cliff swallow	*Hirundo pyrrhonota*	-	No
Common raven	*Corvus corax*	-	Yes
Cooper’s hawk	*Accipiter cooperii*	PIF	Yes
Dusky grouse	*Dendragapus obscurus*	-	Yes
Ferruginous hawk	*Buteo regalis*	BLM, PIF	Yes
Golden eagle	*Aquila chrysaetos*	BLM, BCC	Yes
Gray flycatcher	*Empidonax wrightii*	PIF	Yes
Gray partridge	*Perdix perdix*	-	No
Great horned owl	*Bubo virginianus*	-	Yes
Greater sage-grouse	*Centrocercus urophasianus*	BLM, BCC, PIF	Yes
Green-tailed towhee	*Pipilo chlorurus*	BCC	Yes
Hairy woodpecker	*Picoides villosus*	-	Yes
Hermit thrush	*Catharus guttatus*	-	Yes

Appendix D Inventory of Migratory and Resident Bird Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status[1]	Observed in Study Area[2]
Horned lark	*Eremophila alpestris*	-	Yes
House finch	*Carpodacus mexicanus*	-	Yes
House wren	*Troglodytes aedon*	-	Yes
Lark sparrow	*Chondestes grammacus*	-	Yes
Lazuli bunting	*Passerina amoena*	-	Yes
Lewis's woodpecker	*Melanerpes lewis*	BLM, BCC, PIF	No
Loggerhead shrike	*Lanius ludovicianus*	BLM, BCC, PIF	No
MacGillivray's warbler	*Oporornis tolmiei*	PIF	Yes
Mountain bluebird	*Sialia currucoides*	-	Yes
Mountain chickadee	*Poecile gambeli*	-	Yes
Mourning dove	*Zenaida macroura*	-	Yes
Northern flicker	*Colaptes auratus*	-	Yes
Northern Goshawk	*Accipiter gentilis*	BLM, BCC	No
Northern harrier	*Circus cyaneus*	-	Yes
Pinyon jay	*Gymnorhinus cyanocephalus*	BLM, BCC, PIF	Yes
Plumbeous vireo	*Vireo plumbeus*	-	Yes
Peregrine falcon	*Falco peregrines*	BLM, BCC, PIF	No
Prairie falcon	*Falco mexicanus*	BLM, PIF	Yes
Red-naped sapsucker	*Sphyrapicus nuchalis*	PIF	Yes
Red-tailed hawk	*Buteo jamaicensis*	-	Yes
Rock wren	*Salpinctes obsoletus*	-	Yes
Ruby-crowned kinglet	*Regulus calendula*	-	Yes
Sage sparrow	*Amphispiza belli*	BCC, PIF	Yes
Sage thrasher	*Oreoscoptes montanus*	BLM, BCC, PIF	Yes
Song sparrow	*Melospiza melodia*	-	Yes
Southwestern willow flycatcher	*Empidonax traillii extimus*	BLM, BCC, PIF	No
Spotted towhee	*Pipilo maculates*	-	Yes
Swainson's hawk	*Buteo swainsoni*	BLM, PIF	Yes
Townsend's solitaire	*Myadestes townsendii*	-	Yes
Turkey vulture	*Cathartes aura*	-	Yes
Vesper sparrow	*Pooecetes gramineus*	BLM, PIF	Yes
Violet-green swallow	*Tachycineta thalassina*	-	Yes
Warbling vireo	*Vireo gilvus*	-	Yes
Western meadowlark	*Sturnella magna*	-	Yes

Appendix D Inventory of Migratory and Resident Bird Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status[1]	Observed in Study Area[2]
Western scrub-jay	*Aphelocoma californica*	-	Yes
Western snowy plover	*Charadrius alexandrinus nivosus*	BLM, BCC	No
Western tanager	*Piranga ludoviciana*	-	Yes
Western wood-peewee	*Contopus sordidulus*	-	Yes
Western yellow-billed cuckoo	*Coccyzus americanus*	BLM, BCC	No
White-breasted nuthatch	*Sitta carolinensis*	-	Yes
White-crowned sparrow	*Zonotrichia leucophrys*	-	Yes
White-throated swift	*Aeronautes saxatalis*	-	Yes
Yellow warbler	*Setophaga petechia*	-	Yes
Yellow-rumped warbler	*Setophaga coronata*	-	Yes

[1] BLM = BLM Sensitive; BCC = USFWS Birds of Conservation Concern; PIF = Nevada Partners in Flight Priority Bird Species.

[2] Identified during baseline biological surveys within the study area.

Sources: BLM 2009a; Floyd et al. 2007; JBR 2011b; Neel 1999; SRK 2011a, 2008; USFWS 2008b.

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Appendix E

Mule Deer Monitoring Plan

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Bald Mountain Mine (BMM) North Operations Area Project
Mule Deer Monitoring Plan

Monitoring Plan Objective:

Measure the effectiveness and success of the decision and the accuracy of analysis and whether the decision is achieving the intended environmental goal of supporting mule deer migration through the project area between seasonal ranges (environmental objective) and determine if predicted environmental direct and indirect effects, as identified in the North and South Operations Area Projects EIS, are accurate.

Coverage:

The BLM will be responsible for inspections to ensure that Barrick is in compliance with the mule deer design features and other measures designed to achieve the environmental objective.

A Wildlife Working Group (WWG) consisting of representatives from the BLM, NDOW, and Barrick will be established in order to review data and reports prepared under this monitoring plan.

Mule deer migration will primarily be monitored by placing GPS collars on individual mule deer that migrate through the North Operations Area Project (NOA). Potential additional information could be gathered and utilized as determined by the WWG, which could include camera traps, track counts, aerial imagery, migratory trail mapping flights (during heavy and fresh snow events), and other tracking methods in order to determine whether the decision is achieving the intended environmental objective and to measure the effectiveness of the mule deer design features and other measures designed to achieve the environmental objective.

Pertinent project development as-builts will be collected and provided by Barrick to the WWG for the annual report preparation to determine the behavioral responses of the collared individuals from development within the project area.

Frequency:

Inspections will be conducted prior to each migration season (e.g., January/early February and August/early September) in order to ensure that Barrick is in compliance with the mule deer design features and others measures designed to achieve the environmental objective.

Annual monitoring data points will be collected from mule deer GPS collars at regular intervals to be determined by the WWG in order to meet the objective of the monitoring plan. Time intervals will be modified as needed to obtain more precise migrating mule deer locations through the NOA.

Pertinent project development as-builts will be collected in early November and late February and provided to the WWG at the end of the migration season.

Intensity:

Duration:

Monitoring will be conducted from the signing of the Record of Decision (ROD) until 3 years after all facilities have been recontoured and reseeded within the North Operations Area. However, the monitoring plan will be reevaluated by the WWG after 5 years and every year thereafter and the WWG will provide a recommendation to the BLM to determine whether additional monitoring would be required to meet the monitoring plan objective identified above. Subsequently, the BLM Authorized Officer may determine to terminate the monitoring requirements.

Methods:

Monitoring of the mule deer design features and other measures designed to achieve the environmental objective will be conducted by performing inspections. Photos, locations, and descriptions will be documented during these inspections.

Mule deer migration movement will be monitored by collaring migratory mule deer that are expected to move through the NOA during each migration season. If mule deer are collared and determined to be resident mule deer to the area, data from those collars would be noted but not included in the monitoring report and those mule deer would not be recaptured and collared. Capture and collaring locations are expected to vary based on weather and other factors in order to collar mule deer that are expected to migrate through the NOA.

A minimum of 30 mule deer will be collared at all times during the monitoring period. During each subsequent year, additional mule deer will be collared in order to maintain the minimum 30 collared mule deer. To the extent practicable, GPS collars will be redeployed on individual mule deer that are known (from prior telemetry data) to have traversed the NOA. This step will ensure individual behavioral responses to mining development can be detected on an annual basis. This will generally require individual deer to be recaptured approximately every 2 years to maintain a functional GPS collar. If a collared deer dies before the battery life of the collar is depleted, then a new individual may be captured during the following capture period to maintain the required sample size.

Mule deer migration movement may also be potentially monitored with equipment which could include: camera traps, track counts, migratory trail mapping flights (during heavy and fresh snow events), or other tracking methods as determined by the WWG.

Reporting:

Inspection reports will be prepared following the on-site inspections in order to document Barrick's compliance with the mule deer design features and other measures designed to achieve the environmental objective.

An annual report will be prepared by a third party contractor identified by the WWG and selected and approved by the BLM. This analysis will use the collar data plus any other data identified by the

WWG in order to make a determination of whether the monitoring plan objective is being met. The best available science at the time would be applied to the analysis of the data. The BLM will review and approve the annual report.

Other data to be used within the annual report will include:

- Aerial imagery or other pertinent project development as-builts;
- Weather data, including precipitation and snow depth;
- Mule deer collar data from previous years; and
- NDOW annual mule deer assessments.

An annual meeting will be held by the WWG to discuss the information presented in the annual report and to discuss the effectiveness of the mule deer design features and other measures designed to achieve the environmental objective and discuss potential adjustments to the mule deer design features already constructed on-site.

Points of discussion during the annual meetings will include:

- Identifying field trips to be conducted to sites where successful and unsuccessful actions have been completed;
- Presentations of completed actions by BLM, NDOW, and Barrick; and
- Presentations of upcoming actions by BLM, NDOW, and Barrick.

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Appendix F

Special Status Species Identified for the Proposed Project

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Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
MAMMALS					
Pallid bat *Antrozous pallidus*	BLM; NV-SP	Range: Throughout Nevada. Habitat: Found in a variety of habitats from desert scrub to forests. Roosts in a variety of structures including mines, caves, buildings, and trees. Intolerant of roosts in excess of 40°C.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.
Townsend's big-eared bat *Corynorhinus townsendii*	BLM; NV-SPS	Range: Throughout Nevada. Habitat: Highly associated with caves and mines. Very susceptible to disturbance at roost sites. Periodically moves to alternate roosts and actively forages and drinks throughout the winter. Typically forages in open forest habitats.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.
Big brown bat *Eptesicus fuscus*	BLM	Range: Throughout Nevada. Habitat: Found in a variety of habitats including forests, shrublands, and agricultural and urban areas. Roosts in a variety of structures including mines, caves, buildings and trees. More tolerant of human habitation than other bat species. Roosts in groups up to several hundred individuals.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Spotted bat *Euderma maculatum*	BLM; NV-T	Range: Throughout Nevada. Habitat: Found in a variety of habitats from low elevation desert scrub to high elevation coniferous forest habitats, including pinyon-juniper, sagebrush, and urban habitats. Closely associated with rocky cliffs. Roosts primarily in crevices on cliff faces and in caves and mines.	High. This species has been documented in White Pine county, Nevada. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006.
Silver-haired bat *Lasionycteris noctivagans*	BLM	Range: Throughout Nevada but occurs primarily in forest and riparian habitats. Habitat: A forest associated species often found at higher elevations in pinyon-juniper, subalpine fir, aspen and willow habitats. Roosts almost exclusively in trees in the summer. Frequently alternates roost sites. Maternity roost sites are usually in woodpecker holes.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.
Hoary bat *Lasiurus cinereus*	BLM	Range: Patchy distribution throughout Nevada. Habitat: Tree-associated species. Found primarily in forested upland habitats, as well as in forest riparian zones, and agriculture habitats. May occur in park and garden settings in urban areas. A solitary rooster that typically roosts in trees.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
California myotis *Myotis californicus*	BLM	Range: Throughout Nevada but mainly found in the southern half of the state at lower elevations. Habitat: Found in a variety of habitats from desert scrub to forests. Roosts in a variety of structures including mines, caves, buildings, and trees. Actively forages throughout the winter.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.
Western small-footed myotis *Myotis ciliolabrum*	BLM	Range: Throughout Nevada. Habitat: Found in a variety of habitats from desert scrub to pine-fir forests. Roosts in caves, mines and trees. Forages in open areas.	High. This species has been documented at abandoned mines within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2006.
Long-eared myotis *Myotis evotis*	BLM	Range: Throughout Nevada, primarily at higher elevations. Habitat: Primarily a forest-associated species. Roosts in caves, mines and under bridges. May forage within mine and cave structures, gleaning moths from the rock walls.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2006, 2012a.
Little brown myotis *Myotis lucifugus*	BLM	Range: Found primarily in the northern part of Nevada. Habitat: Found at higher elevations in coniferous forest. Requires a nearby water source. Roosts in trees, buildings, caves, and mines. One of the species most commonly found in human structures.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Fringed myotis *Myotis thysanodes*	BLM	Range: Throughout Nevada. Habitat: Found in a variety of habitats from low desert scrub habitats to high elevation coniferous forests. Found from upper elevation creosote bush desert to pinyon-juniper and white fir in the White Pine Range in White Pine County, Nevada. Roosts in mines, caves, trees, and buildings.	High. This species has been documented in White Pine county, Nevada. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006.
Long-legged myotis *Myotis volans*	BLM	Range: Throughout Nevada but absent from the low desert. Habitat: Pinyon-juniper and other higher elevation forest habitats. Night roosts and hibernacula located in caves and mines. Forages in open areas at canopy height.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.
Yuma myotis *Myotis yumanensis*	BLM	Range: Found in the western, southern and north-central part of Nevada. Habitat: Found in a wide variety of habitats from low to mid-elevations, including sagebrush, salt desert scrub, agriculture, playa, and riparian habitats. One of the species that is most tolerant of human habitation and one of the few that thrives in a relatively urbanized environment. Roosts in buildings, trees, mines, caves, bridges and other man-made structures.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Western pipistrelle bat *Pipstrellus hesperus*	BLM	Range: Throughout most of Nevada. More common in the western and southern portions. Habitat: Lower and Upper Sonoran desert habitats of blackbrush, creosote, salt desert shrub and sagebrush, with occasional occurrence in Ponderosa pine and pinyon-juniper, usually in association with rock features such as granite boulders and canyons. Roosts in mainly in rock crevices.	High. This species has been documented in White Pine county, Nevada. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006.
Brazilian free-tailed bat *Tadarida braziliensis*	BLM; NV-SP	Range: Throughout Nevada. Habitat: Found in a wide variety of habitats from desert scrub to coniferous forests. Roosts in caves, mines, trees, bridges, and buildings. Colonies often number in the thousands.	High. This species has been documented within the study area. Suitable roosting and foraging habitat occurs within the study area.	No.	Bradley et al. 2006; JBR 2012a.
Dark kangaroo mouse *Microdipodops megacephalus*	BLM; NV-SP	Range: Throughout Nevada. Habitat: Intermountain desert scrub, sagebrush, grasslands and meadows, badlands and dunes, and areas around desert playas and ephemeral pools.	Moderate. This species has not been documented within the study area; however, suitable sagebrush habitat occurs within the study area.	No.	Wildlife Action Plan Team 2012.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Pygmy rabbit *Brachylagus idahoensis*	BLM	Range: Throughout Nevada but typically found in areas dominated by sagebrush. Habitat: Requires dense sagebrush for cover as well as appropriate deep soils for burrowing (i.e., high clay content). Often found in drainages with taller sagebrush present.	High. This species has been recorded north of the study area near Ruby Lake NWR and likely occurs within the study area based on the presence of suitable habitat. The study area contains approximately 15,853 acres of potentially suitable habitat.	No.	BLM 2004; NNHP 2012b; SRK 2011b.
BIRDS					
Bald eagle *Haliaeetus leucocephalus*	BLM; NV-E	Range: Throughout Nevada. Habitat: Generally nests and roosts in close proximity to large water bodies including rivers, lakes, and reservoirs. Requires abundant food sources such as fish and waterfowl. Breeding period is February 15 to July 15.	Low: Due to the lack of suitable habitat within the study area, occurrence within the study area would be limited to migrating and foraging individuals from the Ruby Lake NWR.	No.	Floyd et al. 2007; Herron et al. 1985; Johnsgard 1990.
Northern goshawk *Accipiter gentilis*	BLM; NV-SPS	Range: Primarily found in the northern two-thirds of Nevada. Habitat: Deep conifer-dominated mixed forests. May exhibit seasonal migrations depending on prey availability. Preferred nesting habitat is aspen stands within coniferous forests along perennial streams. Breeding period is April 15 to August 1.	None.	Yes. No suitable habitat occurs within the study area.	Floyd et al. 2007; Herron et al. 1985; Johnsgard 1990.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Swainson's hawk *Buteo swainsoni*	BLM	Range: Found throughout Nevada, typically in agricultural areas. Habitat: Agricultural valleys and associated uplands. Nests in large shrubs and trees such as cottonwood, willows and aspen. Breeding period is April 15 to July 15.	High. This species has been documented as nesting approximately 1 mile west of the study area. Suitable nesting and foraging habitat occurs within the study area.	No.	Floyd et al. 2007; Herron et al. 1985; JBR 2011b; Johnsgard 1990.
Ferruginous hawk *Buteo regalis*	BLM	Range: Throughout Nevada; mainly in the east-central portion of the state. Habitat: Dry, open country. Nests usually occur in trees at the interface between pinyon-juniper and desert scrub/grasslands. Forages over open areas with an adequate prey base such as jackrabbits and ground squirrels. Breeding period is March 15 to July 15.	High. A total of 10 nests have been documented within or near the study area. Suitable nesting and foraging habitat occurs throughout the study area.	No.	Floyd et al. 2007; Herron et al. 1985; JBR 2011b; Johnsgard 1990.
Golden eagle *Aquila chrysaetos*	BLM	Range: Throughout Nevada. Habitat: Mountain or hilly terrain. Nests usually occur on cliffs or in trees. Forages over open areas with an adequate prey base. Breeding period is March 15 to July 15.	High. A total of seven nests have been documented within or near the study area. Suitable nesting and foraging habitat occurs within the study area.	No.	Floyd et al. 2007; Herron et al. 1985; JBR 2011b; Johnsgard 1990, Stantec 2015.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Peregrine falcon *Falco peregrinus*	BLM; NV-E	Range: Southwest and extreme southeast Nevada. Habitat: Open country near cliffs. Typically migrates south of U.S. during winter months. Nests on cliffs and rock ledges. Forages in open areas typically near water. Breeding period is March 15 to July 15.	None.	Yes. This species known distribution in Nevada is outside the study area.	Floyd et al. 2007; Herron et al. 1985; Johnsgard 1990.
Greater sage-grouse *Centrocercus urophasianus*	FC; BLM	Range: Throughout Nevada in areas with sagebrush. Habitat: Sagebrush grasslands. Leks are located in open areas in close proximity to escape cover. Nests are located in sagebrush habitat, typically within 2 miles of the lek. Broods are raised in wet, grassy areas near sagebrush. Winter habitat consists of south and east facing slopes with minimal snow cover. Breeding period (including displaying, nesting, and brooding) is March 1 to July 31.	High. Nine active, one inactive, and six unknown leks occur within three miles of the study area. Suitable nesting, brooding, and wintering habitat occurs within the study area. In addition, the BLM and NDOW have mapped Core, Priority, and General Habitat within the study area.	No.	Connelly et al. 2000; Floyd et al. 2007; Neel 1999; Wildlife Action Plan Team 2012, Coates et al. 2014.
Western burrowing owl *Athene cunicularia hypugea*	BLM	Range: Throughout Nevada. Habitat: Open country from desert scrub to grasslands. Often found in or around prairie dog colonies and ground squirrel colonies. Nests in burrows. Breeding period is April 15 to August 15.	High. This species has been documented within the study area and suitable nesting and foraging habitat occurs within the study area, especially in recently reclaimed grassland areas.	No.	Floyd et al. 2007; Herron et al. 1985; JBR 2012a.

Appendix F   Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Lewis's woodpecker *Melanerpes lewis*	BLM	Range: A resident breeder in isolated pockets mainly in the northern half of the state. Habitat: During the breeding season, this species prefers open habitats that facilitate its foraging behavior of hawking for insects. Scattered trees and/or snags are necessary for nesting. Open or park-like ponderosa pine, burned-over stands of Douglas fir, mixed conifer, pinyon-juniper, riparian and oak woodlands are preferred nesting areas. Furthermore, this species prefers areas with a grassy and bushy understory. Breeding period is April 15 to July 15.	Moderate. This species has not been documented within the study area; however, suitable nesting and foraging habitat occurs within the study area.	No.	Floyd et al. 2007; Neel 1999; Wildlife Action Plan Team 2012.
Loggerhead shrike *Lanius ludovicianus*	BLM; NV-SPS	Range: Throughout Nevada. Habitat: Open country including desert scrub and sagebrush grasslands. Nests and forages in brushy areas. Breeding period is April 15 to July 15.	High. This species has been observed within the study area and suitable nesting and foraging habitat occurs within the study area.	No.	Floyd et al. 2007; Neel 1999; Wildlife Action Plan Team 2012; JBR 2012a.
Pinyon jay *Gymnorthinus cyanocephalus*	BLM	Range: Throughout Nevada, although more common in the central and southern portions of the state. Habitat: Pinyon-juniper woodlands. Less frequently found in pine forests and sagebrush grasslands. Distribution is determined by availability of food resources. Nests in loose colonies. Breeding period is April 15 to July 15.	High. This species has been documented within the study area during field surveys. Suitable nesting and foraging habitat occurs within the study area.	No.	Floyd et al. 2007; JBR 2012a, 2011; Neel 1999; SRK 2011a; Wildlife Action Plan Team 2012.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Sage thrasher *Oreoscoptes montanus*	BLM; NV-SPS	Range: Throughout Nevada. Habitat: Spends the summer months in sagebrush shrublands and winters in desert scrub. Breeding period is April 15 to July 15.	High: This species has been documented within the study area during field surveys. Suitable nesting and foraging habitat occurs within the study area.	No.	JBR 2012a, 2011b; SRK 2011a; Stokes and Stokes 1996.
Brewer's sparrow *Spizella breweri*	BLM; NV-SPS	Range: Throughout Nevada. Habitat: Sagebrush shrublands, brushy areas, and desert scrub. Except for singing males, this bird is very secretive and found under the canopy cover. Breeding season is April 15 to July 15.	High: This species has been documented within the study area during field surveys. Suitable nesting and foraging habitat occurs within the study area.	No.	JBR 2012a, 2011b; SRK 2011a; Stokes and Stokes 1996.
Black rosy-finch *Leucosticte atrata*	BLM	Range: In Nevada, this species breeds on the highest mountains of Elko and White Pine counties. Habitat: Breeds and nests in alpine tundra habitat. Nests on high ridges and peaks (9,000 to 13,000 feet in elevation) near rock cover, usually in crevices and holes in cliff sides. Breeding period is May 1 to July 15.	None.	Yes. No suitable habitat occurs within the project area.	Floyd et al. 2007; Neel 1999; Wildlife Action Plan Team 2012.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
AMPHIBIANS					
Northern leopard frog *Rana pipiens*	BLM; NV-SP	Range: Isolated habitats throughout Nevada. Absent from the southwest portion of the state. Habitat: Springs, slow streams, marshes, bogs, ponds, canals, flood plains, reservoirs, and lakes. Usually found in permanent water with rooted aquatic vegetation. During the summer, commonly inhabits wet meadows and fields. Females typically lay eggs in late April and May. Tadpoles develop into frogs from mid-summer to late fall.	Low. No known records of this species exist for the study area, although this species has been documented north of the study area at the Ruby Lake NWR. Suitable habitat occurs at the springs and seeps located within the study area.	No.	NatureServe 2012; NNHP 2012a; SRK 2007.
PLANTS					
White bearpoppy *Arctomecon merriamii*	BLM	Range: Clark, Lincoln, and Nye counties, Nevada; also in California. Habitat: On a wide variety of dry to sometimes moist basic soils, including alkaline clay and sand, gypsum, calcareous alluvial gravels, and carbonate rock outcrops. Elevation: 2,000 to 6,280 feet amsl. Flowering: Spring.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Eastwood milkweed *Asclepias eastwoodiana*	BLM	Range: Esmeralda, Lander, Lincoln, and Nye counties, Nevada. Habitat: Open areas on a wide variety of basic soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition, frequently in small washes or other moisture-accumulating micro-sites, in the shadscale, mixed-shrub, sagebrush and lower pinyon-juniper zones. Elevation: 4,680 to 7,080 feet amsl. Flowering: late-spring.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, the NOA and SOA projects are outside of the elevation for the species.	Yes.	NNHP 2001.
Torrey milkvetch *Astragalus calycosus* var. *monophyllidius*	BLM	Range: Clark, Elko, Eureka, Lincoln, and Nye counties, Nevada, also in Utah. Habitat: Unknown. Elevation: 5,350 to 7,465 feet amsl. Flowering: unknown.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.
Veyo milkvetch *Astragalus ensiformis* var. *gracilior*	BLM	Range: Lincoln County, Nevada, Washington County, Utah. Habitat: Open washes, valley floors, and hillsides, in clay soil, with pinyon-juniper and sagebrush species. Elevation: 4,200 to 5,000 feet.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NatureServe 2013.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Needle Mountains milkvetch *Astragalus eurylobus*	BLM	Range: Known within Lincoln and Nye counties, Nevada and also in Arizona and Utah. Habitat: Generally deep, barren, sandy, gravelly, or clay soils derived from sandstone or siliceous volcanics, frequently in or along drainages. Elevation: 4,600 to 5,750 feet amsl. Flowering late spring.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.
Threecorner milkvetch *Astragalus geyeri* var. *triquetrus*	BLM, NV-SP	Range: Clark and Lincoln counties, Nevada; also in Arizona. Habitat: Open, deep sandy soil or dunes, generally stabilized by vegetation and/or a gravel veneer. Dependent on sand dunes or deep sand in Nevada. Elevation: 1,100 to 2,400 feet amsl. Flowering: late-winter to early spring.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.
Straw milkvetch *Astragalus lentiginosus* var. *stramineus*	BLM	Range: Mohave County, Arizona, Clark County, Nevada, and Washington County Utah. Habitat: Sandy and gravelly flats and dunes. Elevation 2,000 to 3,000 feet. Flowering: Unknown.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NatureServe 2013.
Long-calyx eggvetch *Astragalus oophorus* var. *lonchocalyx*	BLM	Range: Lincoln County, Nevada; also in Utah. Habitat: No Information available. Elevation: 6,000 to 7,480 feet amsl. Flowering: Unknown.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001; NatureServe 2013.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Currant milkvetch *Astragalus uncialis*	BLM	Range: Millard County, Utah; and Nye County, Nevada. Habitat: Found in shadscale communities in Utah, and sagebrush communities in Nevada. In Nevada, found on dry, open, sparsely vegetated, calcareous sandy-clay soils on flats and gentle slopes of hillsides and alluvial fans. Elevation 4,800 to 6,050 feet amsl. Flowering late-spring.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NatureServe 2013; NNHP 2001.
Dainty moonwort *Botrychium crenulatum*	BLM	Range: Clark County, Nevada, and may include Elko, Esmeralda, Lander, Lyon, Mineral, Nye, and White Pine counties, Nevada; also in Arizona, California, Idaho, Montana, Oregon, Utah, Washington, and Wyoming. Likely occurs in isolated pockets in many of the higher and wetter mountains of Nevada. Habitat: Aquatic or wetland-dependent in Nevada. Elevation: 8,202 to 11,150 feet amsl. Flowering late-spring.	None. The proposed NOA and SOA projects do not meet the required habitat characteristics.	Yes.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Monte Neva paintbrush *Castilleja salsuginosa*	BLM, NV-SP	Range: Eureka and White Pine counties, Nevada. Nevada endemic. Habitat: Damp, open, alkaline to saline clay soils of hummocks and drainages on travertine hot-spring mounds with greasewood, rubber rabbitbrush, alkali sacaton, etc. Aquatic or wetland-dependent. Elevation: 5,965 to 6,130 feet amsl. Flowering late-spring to summer.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, it is highly unlikely that suitable habitat is found in the study area.	Yes.	NNHP 2001.
Intermountain wavewing *Cymopterus basalticus*	BLM	Range: White Pine County, Nevada, also in Utah. Habitat (Not reviewed for Nevada): Bare basaltic rocks, barren clays, and (in Utah) gravelly hills and alluvial fans, mostly on dolomite in the pinyon-juniper, sagebrush, and shadscale zones. Elevation: 4,429 to 6,998 feet amsl. Flowering: spring.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, the NOA and SOA projects are outside of the elevation for the species.	Yes.	NNHP 2001.
Nevada willowherb *Epilobium nevadense*	BLM	Range: Clark, Eureka, and Lincoln counties, Nevada; also in Utah. Habitat: (Utah) - Slopes with limestone outcrops or talus at 5,118 to 9,186 m elevation. Associated with singleleaf pinyon and ponderosa pine. Habitat information not available for Nevada. Elevation: 6,000 to 8,930 feet amsl. Flowering: unknown.	Low. Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, it is unlikely the species would be found in the project footprint.	Yes.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Antelope Canyon goldenbush *Ericameria cervina*	BLM	Range: northwest Arizona, adjacent Nevada, and Utah. Habitat: Rock-crevices and talus, often on granitic outcrops and soils. Elevation 4,921 to 7, 874 feet amsl. Flowering: late summer-fall.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	Efloras 2008.
Sheep fleabane *Erigeron ovinus*	BLM	Range: Clark and Lincoln counties, Nevada. Known only from the Sheep and Groom ranges and Mount Irish. Nevada endemic. Habitat: Crevices in carbonate cliffs and ridgeline outcrops in the pinyon-juniper and montane conifer zones. Elevation: 3,600 to 8,400 feet amsl. Flowering late-spring to summer.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.
Las Vegas buckwheat *Eriogonum corymbosum* var. *nilesii*	BLM	Range: Clark County, Nevada; also in Washington County, Utah. Habitat: On and near gypsum soils, often forming low mounds or outcrops in washes and drainages, or in areas of generally low relief, often with California bearpoppy and other gypsum-tolerant species, surrounded by burrobush, Desert princes' plume, fourwing saltbush, Torrey's jointfir, creosote bush, catclaw acacia, Mojave seablite, Fremont's dalea, etc. Elevation: 1,900 to 3,839 feet amsl. Flowering summer to fall.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001

Appendix F   Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Scarlet buckwheat *Eriogonum microthecum* var. *phoeniceum* [*Eriogonum microthecum* var. *arceuthinum]*	BLM	Range: Juab and Millard counties, Utah. Habitat: Tuffaceous ash outcrops, sagebrush communities, pinyon-juniper woodlands. Elevation: 5,429 to 6,889 feet amsl.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	Efloras 2008.
Deer Lodge buckwheat *Eriogonum pharnaceoides* var. *cervinum*	BLM	Range: Lincoln County, Nevada, Iron and Washington counties, Utah, and Mohave County, Arizona. Habitat: Sandy or gravelly slopes, sagebrush, and mountain mahogany communities, oak, pinyon-juniper and montane conifer woodlands. Elevation: 4,593 to 7,545 feet amsl. Flowering: July to September.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	Efloras 2008.

Appendix F   Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status¹	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Sticky buckwheat *Eriogonum viscidulum*	BLM, NV-SP	Range: Clark and Lincoln counties, Nevada; also in Arizona. Habitat: Deep loose sandy soils in washes, flats, roadsides, steep aeolian slopes, and stabilized dune areas, with burrobush, creosote bush, big galleta, littleleaf ratany, Indian ricegrass, saltcedar, arrowweed, geyer's milkvetch, gravel milkvetch, little deserttrumpet, Torrey's jointfir, desert twinbugs, breadroot, California croton, sand dropseed, Fremont's dalea, sand verbena, woody crinklemat, etc. Can withstand moderate temporary disturbance. Dependent on sand dunes or deep sand in Nevada. Elevation: 1,200 to 2,200 feet amsl.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Sunnyside green gentian *Frasera gypsicola*	BLM, NV-SP	Range: Nye and White Pine counties, Nevada; also in Utah. Habitat: Open, dry, whitish, alkaline, often salt-crusted and spongy silty-clay soils on calcareous flats and barrens, with little if any gypsum content, in cushion-plant associations surrounded by sagebrush, greasewood, and occasionally barberry and swamp cedar vegetation, with pygmy sagebrush, big sagebrush, Shockley's buckwheat, Chamber's twinpod, Welsh's cryptantha, fineleaf hymenopappus, mound phlox, dwarf pepperweed, etc. Elevation: 5,180 to 5,510 feet amsl. Flowering: Summer.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, it is highly unlikely that suitable habitat is found in the study area.	Yes.	NNHP 2001.
Sand cholla *Grusonia pulchella*	BLM	Range: Churchill, Douglas, Esmeralda, Lander, Lincoln, Mineral, Nye, Pershing, and Washoe counties, Nevada; also in Arizona, California, and Utah. Habitat: (not yet reviewed for Nevada): Sand of dunes, dry-lake borders, river bottoms, washes, valleys, and plains in the desert. Dependent on sand dunes or deep sand in Nevada. Elevation: 3,950 to 6,300 feet amsl. Flowering: unknown.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, the NOA and SOA projects are outside of the elevation for the species.	Yes.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Rock purpusia *Ivesia arizonica* var. *saxosa*	BLM	Range: Lincoln and Nye counties, Nevada. Endemic to Nevada. Habitat: Crevices of cliffs and boulders on volcanic and possibly carbonate rocks in the upper mixed-shrub, sagebrush, and pinyon-juniper zones. Elevation: 4,925 to 6,800 feet amsl. Flowering: May to July.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.
Waxflower *Jamesia tetrapetala*	BLM	Range: Lincoln, Nye, and White Pine counties, Nevada; also in Utah. Habitat: (not yet reviewed for Nevada): Crevices in limestone cliffs. Elevation: 7,000 to 10,720 feet amsl. Flowering: Unknown.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, it is unlikely the species would be found in the project footprint.	Yes.	NNHP 2001.
Maquire's bitterroot *Lewisia maguirei*	BLM	Range: Nye County, Nevada. Endemic to the Quinn Canyon and Grant ranges. Habitat: Dry, sparsely vegetated carbonate scree or shallow gravelly clay soils on steep slopes and ridgelines of all aspects in the pinyon-juniper zone with desert frasera, Torrey's milkvetch, stemless four-nerve daisy, Nevada onion, rock goldenrod, etc. Elevation: 7,360 to 8,280 feet amsl. Flowering: late-spring.	None. Species is an endemic with limited distribution. The proposed NOA and SOA projects are located outside of the species limited range.	Yes.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Pioche blazingstar *Mentzelia argillicola*	BLM	Range: Lincoln County, Nevada, Sanpete and Sevier counties, Utah. Habitat: Silty clay soils on knolls and slopes with sparse vegetation Elevation: around 5,600 feet amsl. Flowering: unknown.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NatureServe 2013; Holmgren and Holmgren 2002
Tiehm blazingstar *Mentzelia tiehmii*	BLM	Range: Endemic to the White River Valley within northeastern Nye County and adjacent Lincoln County, Nevada. Habitat: Unknown. Elevation: 4,900 to 5,200 feet amsl. Flowering late June to early September.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	Holmgren and Holmgren 2001; NatureServe 2010; NNHP 2001.
Tunnel Springs beardtongue *Penstemon concinnus*	BLM	Range: Lincoln and White Pine counties, Nevada; also in Utah. Habitat: no summary available. Elevation: 6,200 to 6,600 feet amsl. Flowering: unknown.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, it is highly unlikely that suitable habitat is found in the study area. In further, the proposed project is outside the range of known locations.	Yes.	NNHP 2013.
Pennell beardtongue *Penstemon leiophyllus* var. *francisci-pennellii*	BLM	Range: Lincoln, Nye, and White Pine counties, Nevada; also in Utah. In Nevada known from the Snake, Wilson Creek, southern Schell Creek, Egan, and Grant ranges. Habitat: (not yet reviewed for Nevada): Rocky calcareous slopes, shaded banks. Elevation: 7,000 to 11,500 feet. Flowering: Unknown.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, it is highly unlikely that suitable habitat is found in the study area. In further, the proposed project is outside the range of known locations.	Yes.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Parish phacelia *Phacelia parishii*	BLM	Range: Clark, Lincoln, Nye, and White Pine counties, Nevada; also in Arizona and California. Habitat: Moist to superficially dry, open, flat to hummocky, mostly barren, often salt-crusted silty-clay soils on valley bottom flats, lake deposits, and playa edges, often near seepage areas, sometimes on gypsum deposits, surrounded by saltbush scrub vegetation. Aquatic or wetland-dependent in Nevada. Elevation: 2,190 to 5,922 feet amsl.	Low. The proposed NOA and SOA projects have limited aquatic or wetland vegetation and are outside the range of known locations.	Yes.	NNHP 2001.
Blaine pincushion *Sclerocactus blainei*	BLM	Range: Nye County, Nevada; also in Utah. Habitat: Alkaline calcareous and volcanic gravelly clay soils in open valley bottom areas in the shadscale and lower sagebrush zones with greasewood, James galleta, shadscale saltbush, big sagebrush, rubber rabbitbrush, etc. Elevation: 5,100 to 5,300 feet amsl. Flowering: late-spring.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.
Great Basin fishhook cactus *Sclerocactus pubispinus*	BLM	Range: Lincoln, Elko and White Pine counties, Utah; Beaver, Iron, Juab, Millard, Sevier, and Toole counties, Utah. Habitat: Rocky hillsides of woodland and upper desert mountains. Elevation range and flowering period unknown.	Low. While the proposed NOA and SOA projects do meet some of the required habitat characteristics, it is highly unlikely that suitable habitat is found in the study area. In further, the proposed NOA and SOA projects are located outside the known range of the species.	Yes.	NNHP 2001; NatureServe 2013.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Schlesser pincushion *Sclerocactus schlesseri*	BLM	Range: Lincoln County, Nevada; also in Utah. Possible or probable Nevada endemic. Habitat: Open, stable or stabilized, gravelly, sandy silt or silty clay soils derived from somewhat ashy and/or gypsiferous lacustrine sediments, on mesic microsites created and/or maintained by gentle north to east aspects, dense shrub and/or grass canopies, high clay and silt content of the soil, and/or cryptobiotic soil crusts, usually associated with such soil crusts in the shadscale zone. Elevation: 4,760 to 5,145 feet amsl. Flowering: late-spring.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.
Nachlinger's catchfly *Silene nachlingerae*	BLM	Range: Elko, Nye, and White Pine counties, Nevada. Nevada endemic. Habitat: Generally dry, exposed or somewhat sheltered carbonate (rarely quartzite) crevices in ridgeline outcrops, talus, or very rocky soils on or at the bases of steep slopes or cliffs, on all aspects but predominantly on northwesterly to northeasterly exposures, mainly in the subalpine conifer zone. Elevation: 7,160 to 11,250 feet amsl. Flowering: Summer.	Moderate. Potential habitat could occur in the study area.	No.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
St. George blue-eyed grass *Sisyrinchium radicatum*	BLM	Range: Known from southern Nevada; and southwestern Utah, apparently restricted to the St. George-Las Vegas region. Habitat: Moist meadows or on streambanks associated with bluegrass, rush, and sea milkwort. Elevation: 1,970 to 4,265 feet amsl. Flowering late-spring to mid-summer.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NatureServe 2013; Efloras 2008.
Railroad Valley globemallow *Sphaeralcea caespitosa* var. *williamsiae*	BLM	Range: Nye County, Nevada. Habitat: Dry, open flat to gently sloped, gravelly carbonate soils on alluvium and valley fill, often more abundant on recovering disturbances such as washes and roadsides in the greasewood, shadscale and mixed shrub zones. Elevation: unknown. Flowering May - June.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NatureServe 2013; NNHP 2001.

Appendix F   Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Ute ladies'-tresses orchid *Spiranthes diluvialis*	BLM, FT	Range: Lincoln and White Pine counties, Nevada; also in Colorado, Idaho, Montana, Nebraska, Utah, and Wyoming. Habitat: Moist to very wet, somewhat alkaline or calcareous native meadows near streams, springs, seeps, lake shores, or in abandoned stream meanders that still retain ample ground water, global. Aquatic or wetland-dependent in Nevada. Elevation: In Nevada, found around 4,750 feet amsl. Flowering: Summer.	None. The proposed NOA and SOA projects do not have the required habitat characteristics.	Yes.	NNHP 2001.
Currant Summit clover *Trifolium andinum* var. *podocephalum*	BLM	Range: Lincoln and Nye counties, Nevada. Endemic to the White Pine and Egan ranges. Habitat: Crevices of volcanic or carbonate rock in the pinyon-juniper zone, Elevation: 6,900 to 7,400 feet amsl. Flowering: late-springs to summer.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.

Appendix F Special Status Species Identified for the Proposed Project

Common Name/ Scientific Name	Status[1]	Range and Habitat Requirements	Potential for Occurrence Within or Near the Project Area	Eliminated from Detailed Analysis	References
Rock violet *Viola lithion*	BLM	Range: Elko, Nye, and White Pine counties, Nevada; also in Utah. In Nevada known only from the White Pine and Pilot ranges. Habitat: Seasonally wet crevices in steep carbonate or quartzite outcrops in shaded northeast-facing avalanche chutes and cirque headwalls in the subalpine conifer zone. Elevation: 7,840 to 10,480 feet amsl. Flowering: late-spring to summer.	None. The proposed NOA and SOA projects are outside of the species range.	Yes.	NNHP 2001.

[1] Status:

BLM = BLM Sensitive Species.

FC = Federal Candidate Species.

FT = Federally Threatened Species.

NV-SP = Nevada State Protected.

NV-SPS = Nevada State Protected Sensitive.

NV-T = Nevada State Threatened.

Appendix G

Visual Resources

Appendix G1

Visual Simulations

BLM

Ely District Office

**Bald Mountain Mine
North and South Operations
Area Projects EIS**

Figure G-1

**Visual Simulations for
KOP-1**

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

06/04/2014

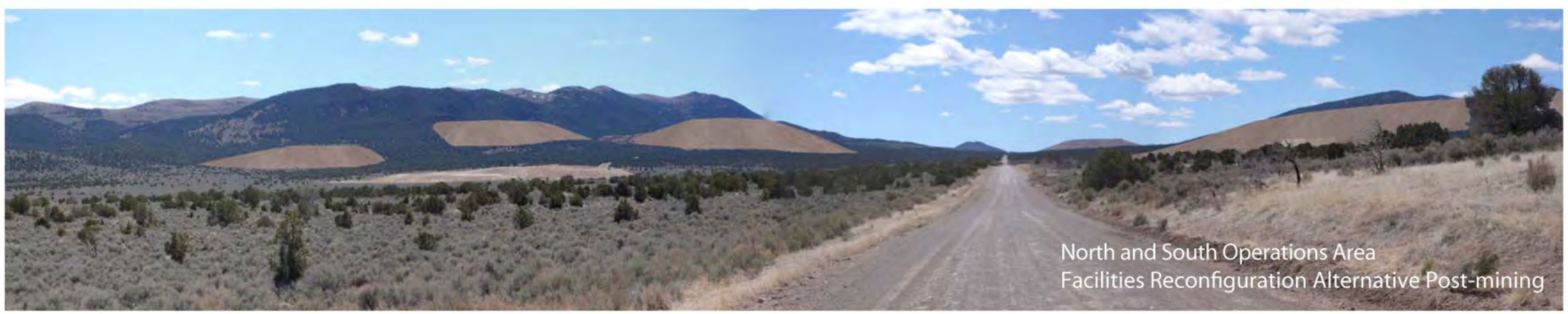
BLM

Ely District Office

Bald Mountain Mine
North and South Operations
Area Projects EIS

Figure G-2

Visual Simulations for
KOP-2



Bald Mountain Mine
North and South Operations
Area Projects EIS

Figure G-3

Visual Simulations for
KOP-3

BLM

Ely District Office

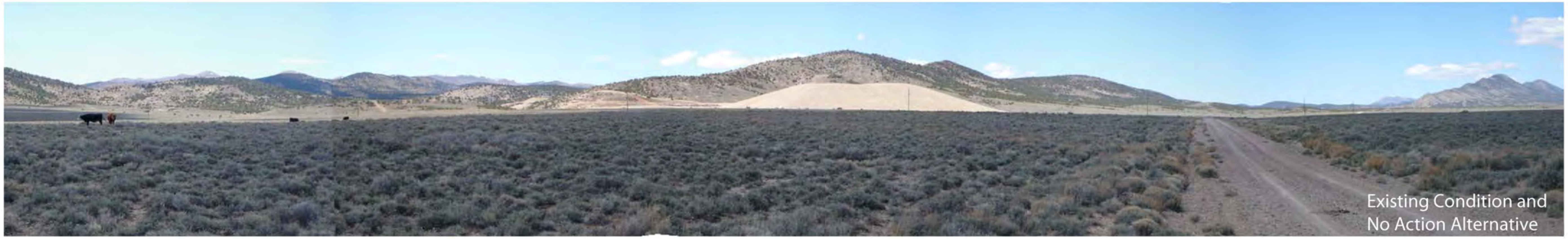
BLM

Ely District Office

Bald Mountain Mine
North and South Operations
Area Projects EIS

Figure G-4

Visual Simulations for
KOP-4



BLM

Ely District Office

**Bald Mountain Mine
North and South Operations
Area Projects EIS**

Figure G-5

**Visual Simulations for
KOP-5**

BLM

Ely District Office

Bald Mountain Mine
North and South Operations
Area Projects EIS

Figure G-6

Visual Simulations for KOP-6

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

**Bald Mountain Mine
North and South Operations
Area Projects EIS**

Figure G-7

**Visual Simulations for
KOP-7**

BLM

Ely District Office

BLM

Ely District Office

Bald Mountain Mine North and South Operations Area Projects EIS

Figure G-8

Visual Simulations for KOP-8

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Bald Mountain Mine
North and South Operations Area Projects EIS

Figure G-9

Visual Simulations for KOP-9

BLM

Ely District Office

BLM

Ely District Office

Bald Mountain Mine
North and South Operations
Area Projects EIS

Figure G-10

Visual Simulations for
KOP-1
(Western Redbird
Modification Alternative)

Appendix G2

Contrast Rating Forms

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/24/2012

District **Ely FO**

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name **Bald Mountain Mine**	**4. Location** Nevada SH 892-Pony Express Tr.	**5. Location Sketch** Please see Figure 3.19-1
2. Key Observation Point **KOP-1**	**Township**	
3. VRM Class **IV**	**Range**______________ **Section**______________	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST		FEATURES											
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X					X	
	Line	X						X				X	
	Color		X			X						X	
	Texture		X				X					x	

2. Does project design meet visual resource management objectives? ☑ **Yes** ☐ **No** **(Explain on reverse side)**

3. Additional mitigating measures recommended ☐ **Yes** ☐ **No (Explain on reverse side)**

Evaluator's Names	**Date**
M. Paulson	03/06/2013

BLM has directed the use of building surface color from the BLM Standard Environmental Colors Chart, with one color for those buildings/structures in disturbed soils (Carlsbad Canyon color), and another color in areas with surrounding vegetation, including tree lines (Shadow Gray color). Vegetation and landform reclamation are included in the vegetation section.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/24/2012

District Ely FO

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name **Bald Mountain Mine**	**4. Location** White Pine Cty Rd 3-Pony Exp Tr.	**5. Location Sketch** Please see Figure 3.19-1
2. Key Observation Point **KOP-2**	**Township**	
3. VRM Class **III**	**Range**______________ **Section**______________	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X					X	
	Line	X						X				X	
	Color		X			X						X	
	Texture		X				X					x	

2. Does project design meet visual resource management objectives? ☐ **Yes** ☑ **No** **(Explain on reverse side)**

3. Additional mitigating measures recommended ☐ **Yes** ☐ **No** **(Explain on reverse side)**

Evaluator's Names	**Date**
M. Paulson	03/06/2013

Strong contrasts of form, line, color, and/or texture do not meet VRM Class III management objectives.

BLM has directed the use of building surface color from the BLM Standard Environmental Colors Chart, with one color for those buildings/structures in disturbed soils (Carlsbad Canyon color), and another color in areas with surrounding vegetation, including tree lines (Shadow Gray color). Vegetation and landform reclamation are included in the vegetation section.

The Reconfiguration Alternative contrasts will be less than the Proposed Action and will meet VRM Class III objectives from this KOP (KOP-2) over the long term.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/24/2012

District Ely FO

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name **Bald Mountain Mine**	**4. Location** White Pine Cty Rd 3 – Ruby Valley. **Township** **Range**_______________ **Section**_______________	**5. Location Sketch** Please see Figure 3.19-1
2. Key Observation Point **KOP-3**		
3. VRM Class **III**		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X					X	
	Line	X						X				X	
	Color		X			X						X	
	Texture		X				X					x	

2. **Does project design meet visual resource management objectives?** ☐ **Yes** ☑ **No** **(Explain on reverse side)**

3. **Additional mitigating measures recommended** ☐ **Yes** ☐ **No (Explain on reverse side)**

Evaluator's Names	**Date**
M. Paulson	03/06/2013

Strong contrasts of form, line, color, and/or texture do not meet VRM Class III management objectives.

BLM has directed the use of building surface color from the BLM Standard Environmental Colors Chart, with one color for those buildings/structures in disturbed soils (Carlsbad Canyon color), and another color in areas with surrounding vegetation, including tree lines (Shadow Gray color). Vegetation and landform reclamation are included in the vegetation section.

The Reconfiguration Alternative contrasts will be less than the Proposed Action and will meet VRM Class III objectives from this KOP (KOP-3) over the long term.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/24/2012

District **Ely FO**

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name **Bald Mountain Mine**	**4. Location** BLM Road-Alligator Ridge Area.	**5. Location Sketch** Please see Figure 3.19-1
2. Key Observation Point **KOP-4**	**Township**	
3. VRM Class **IV**	**Range** **Section**______________	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

		FEATURES											
DEGREE OF CONTRAST		**LAND/WATER BODY (1)**				**VEGETATION (2)**				**STRUCTURES (3)**			
		Strong	**Moderate**	**Weak**	**None**	**Strong**	**Moderate**	**Weak**	**None**	**Strong**	**Moderate**	**Weak**	**None**
Elements	**Form**	X					X					X	
	Line	X						X				X	
	Color		X			X						X	
	Texture		X				X					x	

2. Does project design meet visual resource management objectives? ☑ **Yes** ☐ **No**
(Explain on reverse side)

3. Additional mitigating measures recommended
☐ **Yes** ☐ **No (Explain on reverse side)**

Evaluator's Names M. Paulson

Date 03/06/2013

Strong contrasts of form, line, color, and/or texture comply with VRM Class IV management objectives.

BLM has directed the use of building surface color from the BLM Standard Environmental Colors Chart, with one color for those buildings/structures in disturbed soils (Carlsbad Canyon color), and another color in areas with surrounding vegetation, including tree lines (Shadow Gray color). Vegetation and landform reclamation are included in the vegetation section.

The Reconfiguration Alternative contrasts will be less than the Proposed Action as seen from this KOP (KOP-4) over the long term.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/24/2012

District Ely FO

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name **Bald Mountain Mine**	**4. Location** BLM Road-Sunshine Area.	**5. Location Sketch** Please see Figure 3.19-1
2. Key Observation Point **KOP-5**	**Township**	
3. VRM Class **IV**	**Range** **Section**______________	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X					X	
	Line	X						X				X	
	Color		X			X						X	
	Texture		X				X					x	

2. Does project design meet visual resource management objectives? ☑ **Yes** ☐ **No** **(Explain on reverse side)**

3. Additional mitigating measures recommended ☐ **Yes** ☐ **No (Explain on reverse side)**

Evaluator's Names	**Date**
M. Paulson	03/06/2013

Strong contrasts of form, line, color, and/or texture comply with VRM Class IV management objectives.

BLM has directed the use of building surface color from the BLM Standard Environmental Colors Chart, with one color for those buildings/structures in disturbed soils (Carlsbad Canyon color), and another color in areas with surrounding vegetation, including tree lines (Shadow Gray color). Vegetation and landform reclamation are included in the vegetation section.

The Reconfiguration Alternative contrasts will be less than the Proposed Action as seen from this KOP (KOP-5) over the long term.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/24/2012

District Ely FO

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name **Bald Mountain Mine**	**4. Location** Long Valley Road.	**5. Location Sketch** Please see Figure 3.19-1
2. Key Observation Point **KOP-6**	**Township**	
3. VRM Class **IV**	**Range** **Section**______________	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form	X					X					X	
	Line	X						X				X	
	Color		X			X						X	
	Texture		X				X					x	

2. Does project design meet visual resource management objectives? ☑ **Yes** ☐ **No** **(Explain on reverse side)**

3. Additional mitigating measures recommended ☐ **Yes** ☐ **No (Explain on reverse side)**

Evaluator's Names	Date
M. Paulson	03/06/2013

Strong contrasts of form, line, color, and/or texture comply with VRM Class IV management objectives.

BLM has directed the use of building surface color from the BLM Standard Environmental Colors Chart, with one color for those buildings/structures in disturbed soils (Carlsbad Canyon color), and another color in areas with surrounding vegetation, including tree lines (Shadow Gray color). Vegetation and landform reclamation are included in the vegetation section.

The Reconfiguration Alternative contrasts will be less than the Proposed Action as seen from this KOP (KOP-6) over the long term.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/12/2013

District Ely FO

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name
Bald Mountain Mine

2. Key Observation Point
KOP-7

3. VRM Class
IV

4. Location Sunshine Locality Historic Site

Township

Range

Section

5. Location Sketch

Please see Figure 3.19-1

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
Elements	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form	X					X					X	
Line	X						X				X	
Color		X			X						X	
Texture		X				X					x	

2. **Does project design meet visual resource management objectives?** ☑ **Yes** ☐ **No** **(Explain on reverse side)**

3. **Additional mitigating measures recommended** ☐ **Yes** ☐ **No (Explain on reverse side)**

Evaluator's Names	Date
M. Paulson	05/14/2013

Strong contrasts of form, line, color, and/or texture comply with VRM Class IV management objectives.

BLM has directed the use of building surface color from the BLM Standard Environmental Colors Chart, with one color for those buildings/structures in disturbed soils (Carlsbad Canyon color), and another color in areas with surrounding vegetation, including tree lines (Shadow Gray color). Vegetation and landform reclamation are included in the vegetation section.

The Reconfiguration Alternative contrasts will be less than the Proposed Action as seen from this KOP (KOP-7) over the long term.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/12/2013

District Ely FO

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name
Bald Mountain Mine

2. Key Observation Point
KOP-8

3. VRM Class
III

4. Location Fort Ruby National Historic Landmark

Township

Range_______________

5. Location Sketch

Please see Figure 3.19-1

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST		LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Elements	Form	X					X					X	
	Line	X						X				X	
	Color		X			X						X	
	Texture		X				X					x	

2. **Does project design meet visual resource management objectives?** ☐ Yes ☑ No **(Explain on reverse side)**

3. **Additional mitigating measures recommended** ☐ Yes ☐ No **(Explain on reverse side)**

Evaluator's Names M. Paulson

Date 05/14/2013

Strong contrasts do not meet VRM Class III objectives.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 04/12/2013

District **Ely FO**

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name
Bald Mountain Mine

2. Key Observation Point
KOP-9

3. VRM Class
III

4. Location Fort Ruby National Historic Landmark

Township

Range_______________

5. Location Sketch

Please see Figure 3.19-1

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEXTURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct new roads and buildings
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct new roads and buildings
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct new roads and buildings
TEXTURE	Smooth	Change medium and coarse to smooth	Indistinct new roads and buildings

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements: Form	X					X					X	
Elements: Line	X						X				X	
Elements: Color		X			X						X	
Elements: Texture		X				X					x	

2. Does project design meet visual resource management objectives? ☐ **Yes** ☑ **No** **(Explain on reverse side)**

3. Additional mitigating measures recommended
☐ **Yes** ☐ **No** **(Explain on reverse side)**

Evaluator's Names M. Paulson

Date 05/14/2013

Strong contrasts do not meet VRM Class III objectives.

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 05/15/2015

District Ely FO

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name **Bald Mountain Mine – Western Redbird Modification Alt.**	**4. Location** NV SH 892 Pony Express Tr. **Township** **Range**______________	**5. Location Sketch** Please see Figure 3.19-1
2. Key Observation Point **KOP-1**	**Section**______________	
3. VRM Class **IV**		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar mine landforms, angular mountains and wide planar valley floor.	Planar blanket of pinyon juniper, sagebrush and grasses.	Indistinct roads and buildings in the background.
LINE	Horizontal and angular mine landforms, horizontal valley and angular ridgelines.	Irregular pinyon juniper, sagebrush and grass patterns.	Indistinct roads and buildings in the background
COLOR	Light to medium reddish tan.	Dark olive green pinyon-juniper and light to medium silvery green sagebrush and light tan grasses.	Light tans and grays of distant roads and buildings
TEX-TURE	Smooth landforms.	Smooth, medium and coarse.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Planar and rounded rock disposal and heap leach area	Change from removal of trees and shrubs to indistinct grasses	Indistinct upgraded road
LINE	Vertical, horizontal, and angular rock disposal and heap leach areas	Change from rounded trees and shrubs to horizontal grasses	Indistinct upgraded road
COLOR	Light, medium and dark browns	Change from dark olive trees and varied shrubs to homogenous light tan grasses	Indistinct upgraded road
TEX-TURE	Smooth	Change medium and coarse to smooth	Indistinct upgraded road

SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

DEGREE OF CONTRAST		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Elements	Form		X				X					X	
	Line		X					X				X	
	Color			X				X				X	
	Texture			X				X				x	

2. Does project design meet visual resource management objectives? ☑ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☐ No (Explain on reverse side)

Evaluator's Names	Date
M. Paulson	05/15/2015

See revegetation section.

Appendix H

Programmatic Agreement Regarding the Bald Mountain Mining District Project

PROGRAMMATIC AGREEMENT

AMONG

THE BUREAU OF LAND MANAGEMENT, EGAN FIELD OFFICE

AND

THE NEVADA STATE HISTORIC PRESERVATION OFFICER

REGARDING THE BALD MOUNTAIN MINING DISTRICT PROJECT

WHEREAS, the Bureau of Land Management Egan Field Office (BLM) has determined that the authorization of mining operations at the Bald Mountain Mining District Project (BMMD or Project) for Barrick Gold, Inc. (Barrick) in White Pine County, Nevada, may have an effect on historic properties eligible for inclusion in the National Register of Historic Places (NRHP), and has consulted with the Nevada State Historic Preservation Officer (SHPO) pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA); and

WHEREAS, effects to historic properties in the Area of Potential Effect (APE) (Appendix A) cannot be fully determined and the Signatories desire to enter into this Programmatic Agreement (PA) to set forth procedures to be followed in satisfaction of BLM's Section 106 responsibilities of the National Historic Preservation Act, for the BMMD in the APE; and

WHEREAS, the BLM, the SHPO and the Advisory Council on Historic Preservation (ACHP) are Signatories to a PA governing all aspects of the development for the Project executed in December of 1995; and

WHEREAS, the BLM, the SHPO and the ACHP wish to terminate the existing Bald Mountain Mine PA effective on the day this document is executed and the BLM and the SHPO desire to enter into this PA; and

WHEREAS, BLM has invited Barrick to be a concurring party to this PA; and

WHEREAS, BLM has consulted with the ACHP pursuant to 36 CFR §800.14(b), to develop and execute this PA and the ACHP has elected not to formally enter consultation on the development of this PA; and

WHEREAS, Ely Shoshone and Duckwater Tribes may have an interest in the area and will be contacted and offered an opportunity to participate in the Section 106 process and those tribes requesting an opportunity to participate as concurring parties will be included in the process as provided in this PA; and

WHEREAS, BLM has a Nationwide Programmatic Agreement and a State Protocol Agreement between BLM and SHPO dated February 3, 2012 (Protocol) that govern all other undertakings and historic properties that may occur within the APE and those agreements are hereby incorporated by reference into this PA; and

WHEREAS, the definitions given in the Protocol between the Nevada Bureau of Land Management State Director and the SHPO apply throughout this PA, unless specifically modified below; and

WHEREAS, this PA covers all aspects of authorized mining operations in the BMMD;

NOW, THEREFORE, the Signatories agree that the BMMD shall be administered in accordance with the following stipulations to ensure that historic properties will be treated to avoid or mitigate effects to the extent practicable, regardless of surface ownership, and to satisfy BLM's Section 106 responsibilities for all aspects of the BMMD.

I. ROLES AND RESPONSIBILITIES

A. BLM is responsible for administering this PA. This includes but is not limited to ensuring that all Signatories carry out their responsibilities; overseeing all cultural resource work; and assembling all submissions to the SHPO and consulting parties during the implementation of this PA. The Egan Field Manager is the BLM Authorized Officer for BMMD. The Authorized Officer, or their designee, is the BMMD point of contact for BLM.

B. Barrick's signatory, or their designees, will be the responsible point of contact for the BMMD and provide BLM with any and all information needed to implement this PA.

C. Barrick shall bear the expense of identification, evaluation, and treatment of all historic properties directly or indirectly affected by BMMD related activity. Such costs shall include, but not be limited to, pre-field planning, fieldwork, post-fieldwork analysis, research and report preparation, interim and summary report preparation, publications for the general public, and the cost of curating project documentation and artifact collections. If Barrick withdraws project applications, then Barrick shall incur no further expense except for completing fieldwork and post-fieldwork activities (production of final inventory, testing and data recovery reports covering the description and analysis of data, and the curation of materials) that has occurred as of the date of withdrawal.

D. BLM will be responsible for all submissions to SHPO and any other interested parties identified during the implementation of this PA for the BMMD. Any submission to SHPO or interested parties not from BLM will be considered as informational only and will not trigger any compliance timelines or other actions.

E. BLM shall ensure that ethnographic, historic, architectural, and archaeological work conducted pursuant to this PA is carried out by or under the direct supervision of persons meeting qualifications set forth in the Draft Secretary of the Interior's Professional Qualification Standards dated June 20, 1997 (62 FR 33707-33723) and who have been permitted for such work on public lands by BLM.

F. Barrick, in cooperation with BLM and SHPO, shall provide in-house training to ensure that all its personnel and all the personnel of its contractors and subcontractors are directed not to engage in the illegal collection of historic and prehistoric materials. Subsequent hires will also be required to be subject to similar training. Training can be in association with Barrick's safety and or related job training and project orientation. Barrick shall cooperate with BLM to ensure compliance with the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470) on Federal lands and with Nevada Revised Statutes (NRS) 381 for private lands.

G. Barrick shall be responsible for costs of rehabilitation or mitigation, and may be subject to criminal penalties, should damage to cultural resources inside or outside the APE occur during the period of construction, mine operation or reclamation due to the unauthorized, inadvertent or negligent actions of Barrick, their employees, contractors or any other project personnel.

H. If the BMMD is sold or otherwise transferred to another proponent other than Barrick, the Signatories will determine within 90 days of the sale or transfer if the PA will remain in effect, be amended per Stipulation V, or be terminated per Stipulation VI. All provisions of the PA will remain in effect until such a determination is made.

II. STIPULATIONS

BLM ensure that the following stipulations are carried out:

A. Identification of Historic Properties

1. BLM shall involve interested parties and Tribes identified through the Section 106 process, as appropriate, in all activities carried out under this PA associated with the Project.

2. Identification and evaluation of historic properties shall be conducted on all lands identified within approved Plans of Operation and subsequent amendments on BMMD (Plans). Identification and evaluation may be phased to reflect BMMD's operational timelines.

3. BLM shall require the consulting archaeologists conduct records searches of General Land Office (GLO) plat maps, BLM's Master Title Plats/Historic Index, the GLO Land Records website (http://www.glorecords.BLM SWFO.gov/), the Nevada State Lands Patent Database Query (http://www.lands.nv.gov/patents/patents.htm), The Nevada Cultural Resources Information System (NVCRIS), the National and State Register of Historic Places, National Trail System, historic maps, BLM and SHPO cultural resources records, and pertinent historic records/publications and maps to identify historic properties as a part of the identification process.

4. Required identification activities shall be completed on Federal or private lands owned by Barrick. For privately held lands not owned by Barrick, Barrick shall exercise reasonable effort to obtain access from the landowner for the purpose of conducting inventory, eligibility, and adverse effects analysis. "Reasonable effort" for this purpose is defined as seeking to obtain landowner consent on reasonable, negotiated terms, without resort to any formal legal process or proceedings. After all such reasonable efforts have been made, if access cannot be obtained to private land not owned by Barrick and after consulting with BLM, Barrick shall use existing data to determine the types of resources that might be present and anticipated effects. Upon BLM determination that the intention of this section has been satisfied, BLM Authorized Officer may issue a Notice to Proceed (NTP) for any construction segment as prescribed in Stipulation II.G.

5. BLM shall allow Barrick's point of contact to receive the location of any historic properties that have been or are identified within the APE or in any part of the APE directly from the archeological contractor. Barrick shall protect, secure, and restrict access to this sensitive information to the point of contact. Barrick shall not share this information with others without prior consent in writing from BLM.

B. Eligibility

1. BLM, in consultation with SHPO, shall evaluate all cultural resources recorded under this PA for eligibility to the NRHP based on the following document: *Historic Context II, The Bald Mountain Historic Mining District, White Pine County, Nevada* (Kautz 2011). This document shall be reviewed for adequacy every three years or by the request of a Signatory.

2. BLM shall consult with the appropriate Tribes to evaluate the eligibility of properties of traditional religious and cultural importance within the APE.

3. A separate report will be prepared to document historic properties with standing architectural resources that qualify for the National Register under Criteria A, B, or C in order to expedite SHPO review.

4. To the extent practicable, NRHP eligibility determinations shall be based on documented inventory information. If the information gathered in the inventory is inadequate to determine eligibility, Barrick, through its contractor, may be required to conduct limited subsurface testing or other evaluative techniques to determine eligibility. Subject to approval by BLM, in consultation with SHPO, evaluative testing is intended to provide the minimum data necessary to define the nature, age, and distribution of materials in potential historic properties, to make final evaluations of eligibility, and to inform the development of a treatment plan should data recovery be deemed necessary. BLM requires Barrick's cultural resource contractor be approved for a testing Cultural

Resources Use Permit (CRUP) prior to subsurface probing, testing, data recovery, or surface material collection.

5. If any of the Signatories, Tribes, or other consulting parties disagree regarding eligibility of a cultural resource, BLM and SHPO shall work together with Tribes and interested parties (when appropriate) to seek a resolution on the determination of eligibility. If the dispute cannot be resolved, BLM shall seek a formal determination of eligibility from the Keeper of the National Register in accordance with 36 CFR 63.2. The Keeper's determination will be considered final.

6. Eligibility will be determined prior to the initiation of activities that may adversely affect those cultural resources. Eligibility will be determined in a manner consistent with the Protocol. The required evaluation activities shall be completed on Federal or private lands owned by Barrick. If Barrick cannot gain access to private land not owned by Barrick after a reasonable effort is made, the historic property shall remain unevaluated. Sites may remain unevaluated for the NRHP only with approval by BLM in consultation with SHPO.

C. Treatment

1. BLM shall ensure that BMMD avoids adverse effects to historic properties, whenever practical, through project design, or redesign, relocation of facilities, or by other means in a manner consistent with the Protocol.

2. When avoidance is not practical and data recovery is proposed to minimize or mitigate project related adverse effects to historic properties, BLM, in consultation with the SHPO, shall ensure that Barrick, through its contractor, develops a Data Recovery Treatment Plan (Plan) that is consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-37), *Treatment of Historic Properties: A Handbook* (Advisory Council on Historic Preservation 1980) and ACHP's Recommended Approach for Consultation on the Recovery of Significant Information from Archaeological Sites dated June 17, 1999. The required mitigation activities shall be completed regardless of the ownership (Federal or private lands owned by Barrick) of the lands involved. If Barrick cannot gain access to private lands not owned by Barrick through reasonable efforts, only the portions of the historic property directly affected by the project shall be treated. BLM shall submit the Plan to SHPO for review. Concurrently, BLM shall provide Tribes and other consulting parties, as appropriate, with a copy of the Plan with a fifteen (15) day review opportunity.

3. For historic properties eligible under criteria A through C, BLM will consider, in consultation with SHPO, mitigation other than data recovery in the Treatment Plan (e.g., oral history, historic markers, exhibits, interpretive brochures or publications, etc.). Where appropriate, the Treatment Plan shall include

provisions (content and number of copies) for a publication for the general public.

4. Pursuant to Stipulation F, BLM shall ensure as a condition of approval/special stipulation on any authorization or Notice to Proceed that Barrick, through its contractor, implement and complete the fieldwork portions of any final Treatment or Data Recovery Plan prior to initiating any activities that may affect those historic properties.

5. BLM shall ensure that all records and materials resulting from identification and treatment efforts are curated in accordance with 36 CFR 79 in an approved curation facility in Nevada. As defined in the Native American Graves Protection and Repatriation Act (NAGPRA) materials will be handled in accordance with 43 CFR 10. All materials collected will be maintained in accordance with 36 CFR 79 or 43 CFR 10, until the final treatment report is complete and collections are curated and/or returned to their owners. Barrick, or their contractor, shall provide proof of a current curation agreement to BLM within two (2) weeks of BLM acceptance of the final reports.

6. BLM shall provide to SHPO, Tribes, and other consulting parties as appropriate all final archaeological reports resulting from actions pursuant to this PA. All such reports shall be consistent with contemporary professional standards and the Secretary of Interior's Formal Standards for Final Reports of Data Recovery Programs (48 FR 44716-44740). Final reports will be submitted in both paper and electronic copies and will include digital copies of all associated data (e.g. GPS files, GIS data layers, digital photographs, etc.).

D. Other Considerations

1. Identification, evaluation, and treatment efforts may extend beyond the geographic limits of the APE when the resources being considered extend beyond the boundary of the construction activities. No identification, evaluation, or treatment efforts will occur beyond that necessary to gather data for the completion of the Section 106 process as agreed to in this PA.

2. Information on the location and nature of all cultural resources or information considered proprietary by a Tribe will be held confidential to the extent provided by Federal and state law.

E. Monitoring

1. Any Signatory may monitor actions carried out pursuant to this PA, provided that personnel undertaking monitoring activities shall comply with all applicable Barrick mine safety and health rules and requirements when visiting the mine. To the extent practicable, all monitoring activities conducted by SHPO, Tribes, or

other consulting parties will attempt to minimize the number of monitors involved in the Project.

2. Any areas that BLM, in consultation with the SHPO, identifies as sensitive will be monitored during related construction activities by a qualified individual (Monitor). Monitors shall be empowered to stop work to protect resources if that work is inconsistent with the terms of this PA or any corresponding treatment or monitoring plan.

F. Notices to Proceed

BLM may issue a NTP to Barrick for individual construction segments as defined by Barrick in their Plans, under any of the following conditions:

1. BLM, in consultation with SHPO, have determined that there are no cultural resources within the APE for that construction segment location; or
2. BLM, in consultation with SHPO, have determined that there are no historic properties within the APE for the construction segment locations; or
3. BLM, in consultation with the SHPO, Tribes, and other consulting parties as appropriate, has implemented an adequate Treatment Plan for the properties affected by the construction segment locations; and

(a) Barrick has posted a surety as set forth in Stipulation H. 1.

(b) The fieldwork phase of the treatment option has been completed; and

(c) BLM has accepted a summary description of the fieldwork performed and a reporting schedule for that work; and

(d) BLM shall provide an electronic copy of the summary to SHPO; and

(e) SHPO shall review the summary and if the SHPO concurs or does not respond within two working days of receipt, BLM shall assume concurrence and issue the NTP; and

(f) Barrick shall not begin any ground disturbing activities within the boundary of any historic property until BLM issues a NTP for the property.

G. Time Frames

1. BLM will review and comment on any report submitted by Barrick, through its contractor, within thirty (30) calendar days of receipt.

2. BLM shall submit the results of all identification, evaluation, effects assessment, and treatment efforts, including discovery situations, and Treatment or Data Recovery Plans to the SHPO. The SHPO will have thirty (30) calendar days from their receipt to

review and comment on any submission. In the event SHPO does not respond within thirty (30) calendar days from its receipt, BLM shall assume SHPO concurrence.

3. A draft final report of all identification, evaluation, treatment activities will be due to BLM from Barrick within nine (9) months after the completion of the fieldwork associated with the activity, unless otherwise negotiated. Final reports will be due sixty (60) days after receiving BLM comments.

H. Surety Bonds

1. Based on a written detailed cost estimate submitted by the Cultural Contractor and agreed to by Barrick and BLM, Barrick will post a surety bond with the BLM, not to exceed $500,000 to cover all costs associated with all data recovery fieldwork, analysis, research and report preparation, interim and summary reports, and curation of project documentation and artifact collections in an approved curation facility anticipated to run concurrently from the signing date of the PA to one calendar year from the signing date. The surety shall be posted prior to BLM issuing any NTP.

2. Portions of the surety bond posted shall be subject to forfeiture if the data recovery projects tasks are not completed within the time period established by the treatment option selected; provided, however, BLM and Barrick may agree to extend any such time periods. BLM shall notify Barrick that the surety is subject to forfeiture and shall allow Barrick thirty (30) calendar days to respond before action is taken to forfeit the surety.

3. The surety bond may be increased or decreased annually based on a written detailed cost estimate submitted by the Cultural Contractor and agreed to by Barrick and BLM for concurrently running data recovery projects anticipated for the following year. If the amount of concurrently running data recovery projects exceeds what is presented in the Cultural Contractor's cost estimate, the BLM shall meet with Barrick to increase the bond amount prior the required annual surety bond adjustment date.

J. Post-Review Discovery Situations

Stipulations of this PA and Protocol are intended to identify and mitigate historic properties. Unplanned discoveries of buried cultural resources are not anticipated. In the case of an unplanned discovery, the BLM will ensure that provisions in the Protocol (Section VI.B) and the following stipulations are met.

1. When previously unidentified cultural resources are discovered or an unanticipated impact situation occurs, all BMMD related activities within 100 meters of the discovery/impact will cease immediately. Barrick, through its contractor or its authorized representative, shall secure the location to prevent vandalism or other

damage. Barrick or its authorized representative shall immediately notify the BLM Authorized Officer of the discovery followed by written confirmation. Activity at the location shall be suspended until the discovery has been evaluated and any necessary mitigation measures completed.

2. BLM shall notify SHPO, Tribes, and other consulting parties as appropriate, within one (1) working day of the discovery or unanticipated impact notification, and consider their initial comments on the situation. Within two (2) working days after initial discovery, BLM shall notify SHPO or other parties, of the decision to either allow BMMD Activities to proceed or to require further evaluation and/or mitigation.

3. If BLM determines, in consultation with SHPO, that mitigation for discoveries or unanticipated impacts is required, BLM shall solicit comments from SHPO, Tribes, and other consulting parties, as appropriate, to develop mitigating measures. SHPO, Tribes, and other consulting parties, as appropriate, will have two (2) working days to provide BLM with comments on the nature and extent of mitigative efforts. Within seven (7) working days of initial SHPO notification, BLM will inform SHPO of the nature of the mitigation required, and ensure that such mitigative actions are implemented before allowing BMMD activities to resume.

4. BLM shall ensure that reports of mitigation efforts for discoveries or unanticipated impacts are completed in a timely manner and conform to the Department of Interior's Formal Standards for Final Reports of Data Recovery Program (42 FR 5377-79). Drafts of such reports shall be submitted to the SHPO for a fifteen (15) day review and comment period. BLM will submit final reports to the SHPO, other Signatories, Tribes, and other consulting parties, as appropriate for informational purposes.

5. Any disputes or objections arising during a discovery or unanticipated impact situation regarding the treatment of historic properties that cannot be resolved by BLM and SHPO shall be referred to the Nevada BLM State Office for consultation. The Nevada BLM State Office shall be given seven (7) days to provide BLM with comments.

6. BMMD related activities in the area of the discovery or unanticipated impact will be halted until Barrick is notified by the BLM Authorized Officer in writing that mitigation is complete and activities can resume.

III. Dispute Resolution

1. If any party to this PA, or any other consulting party, objects to any activities proposed pursuant to the terms of this PA, BLM shall consult with the objecting party and SHPO to resolve the issue.

2. An interested person or other consulting party can request participation by the ACHP should consultation not resolve the issue.

3. If there is an objection by SHPO to the manner in which the terms of this PA are implemented, SHPO will notify the Egan Field Manager in writing of the objection. BLM will consult with SHPO to resolve the objection. If BLM determines that the objection cannot be resolved, it shall request consultation by BLM Nevada State Office to help resolve the objection.

4. The Signatories may continue all actions under this PA that are not the subject of the dispute.

IV. Duration

This PA shall become effective on the date of the last signature below, and shall remain in effect for a period of ten years or until terminated as provided in Stipulation VI. If Barrick does not initiate the Project within the ten (10) year period, this PA will automatically terminate.

V. Amendment

Any Signatory to this PA may request that this PA be amended, whereupon the Signatories will consult to consider such amendment. The amendment will be effective on the date a copy signed by all of the Signatories is filed with the ACHP.

VI. Termination

Any Signatory may terminate this PA by providing written notice with cause to the other party. After notification by the initiating party, the other Signatory shall have thirty (30) calendar days to consult to seek agreement on amendments or any other actions that would address the issues and avoid termination. If such consultation fails, the termination will go into effect at the end of this thirty (30) calendar-day period, unless both parties agree to a longer period. The Signatories shall be required to meet any and all current or outstanding obligations the Signatories assumed under the terms of the PA.

EXECUTION of this PA and implementation of its terms evidences that the BLM has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

2/8/13

Jill A. Moore, Egan Field Manager, Ely District, Bureau of Land Management DATE

Rebecca Palmer 2/15/13

Rebecca L. Palmer, Acting Nevada State Historic Preservation Officer DATE

Concurring Party:

Amanda Steensen 2/19/2013

Amanda Steensen, Environmental Superintendent, Barrick Gold, Inc.

DATE

Bureau of Land Management
FEB 28 2013
RECEIVED
Ely, NV

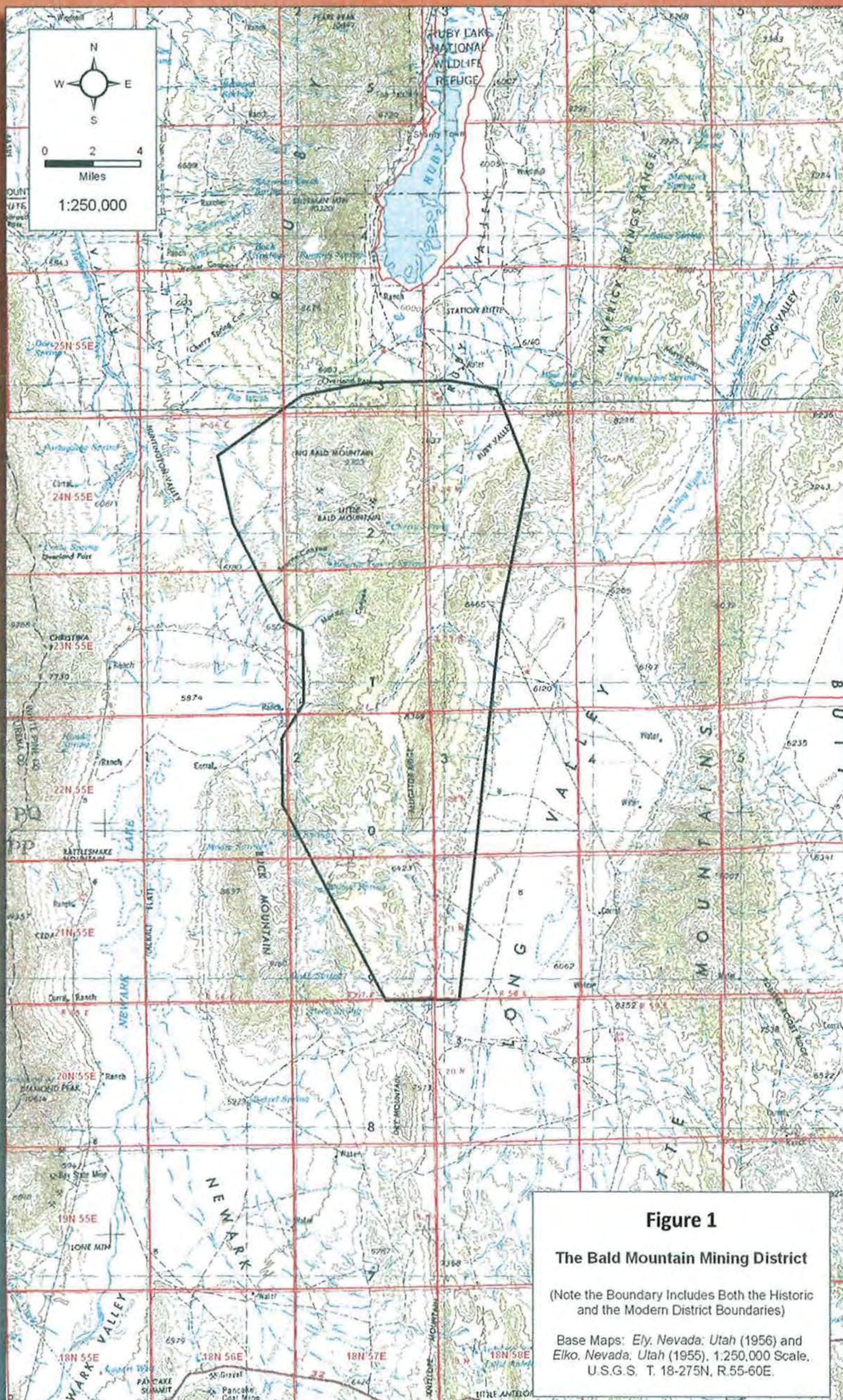


Figure 1

The Bald Mountain Mining District

(Note the Boundary Includes Both the Historic and the Modern District Boundaries)

Base Maps: *Ely, Nevada; Utah* (1956) and *Elko, Nevada; Utah* (1955), 1:250,000 Scale, U.S.G.S. T. 18-275N, R.55-60E.

Appendix I

Memorandum of Understanding Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat

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MEMORANDUM OF UNDERSTANDING

United States Department of Interior
Bureau of Land Management-Nevada State Office

United States Department of Agriculture, United States Forest Service, Humboldt-Toiyabe National Forest,

Nevada Department of Conservation and Natural Resources,

and

Barrick Gold of North America, Newmont Mining Corporation, and Other Companies

MEMORANDUM OF UNDERSTANDING

Among

THE U. S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT, NEVADA STATE OFFICE

THE UNITED STATES DEPARTMENT OF AGRICULTURE, UNITED STATES FOREST SERVICE, HUMBOLDT-TOIYABE NATIONAL FOREST,

NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

And

BARRICK GOLD OF NORTH AMERICA, NEWMONT MINING CORPORATION, and OTHER COMPANIES

Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat

I. PURPOSE

This Memorandum of Understanding ("MOU") establishes a formal partnership among BLM Nevada ("BLM"), Humboldt-Toiyabe National Forest ("HTNF"), the Nevada Department of Conservation and Natural Resources ("DCNR") (together the "Agencies") and Barrick Gold of North America (including its US affiliates and subsidiaries), Newmont Mining Corporation (including its US affiliates and subsidiaries), and other members of the Nevada Mining Association as may choose to execute this Agreement (together the "Companies"). Collectively, the Agencies and Companies shall be referred to as the "Parties."

This MOU provides a consultation process for proposed mining projects occurring in sage-grouse preliminary priority habitat ("PPH") and preliminary general habitat ("PGH") located on federal lands. This process will guide the design and implementation of appropriate and consistent action to avoid, minimize, or mitigate adverse impacts to Greater Sage-grouse and Greater Sage-grouse habitat associated with mining exploration and development.

This MOU is consistent with BLM Washington Office Instructional Memorandum No. 2012-043, entitled Greater Sage-Grouse Interim Management Policies and Procedures, and Nevada BLM Instructional Memorandum No. NV-2012-058, entitled Revised Direction for Proposed Activities within Greater Sage-Grouse Habitat and the Forest Service (Regions 1, 2 and 4) "Interim Conservation Recommendations for Greater Sage-Grouse and Sage-Grouse Habitat" dated October 2, 2012.

II. PROCEDURES

A. The BLM is responsible for the administration and management of public lands. The BLM will be the lead agency in the National Environmental Policy Act ("NEPA") processes as described by 40 C.F.R. §§ 1501.5, 1508.16 and 43 CFR part 3809 for evaluation, analysis, and processing of Plans of Operation and mining exploration Notices of Intent within BLM administered lands.

B. The HTNF is responsible for the administration and management of National Forests. The HTNF will be the lead agency in the NEPA process as described by 40 C.F.R. §§ 1501.5, 1508.16 and 36 CFR 228 Subpart A for evaluation, analysis, and processing of Plans of Operation and mining exploration Notices of Intent within National Forest administered lands.

C. The DCNR is responsible for the administration of mining exploration and development on private and state lands.

D. The Parties agree to become cooperating partners in the formation of the BLM Nevada, Humboldt-Toiyabe National Forest, DCNR, and Nevada mining industry Greater Sage-grouse conservation partnership and in the NEPA process for plans of operation or mining exploration notices on public lands. DCNR will participate as a cooperating agency under 40 CFR §§ 1501.6, 1508.5, 43 CFR part 3809, and 36 CFR 228 Subpart A. Individual mining companies will participate as project applicants in the NEPA processes for their own Plans of Operation or mining exploration Notices of Intent.

E. All Parties agree to:

i. Adhere to and comply with the applicable laws and regulations of the United States and regulations of the Secretary of the Interior and Secretary of Agriculture, for areas under their respective jurisdictions.

ii. Meet as needed on mutually agreed dates to review and evaluate current conditions and trends as well as the implementation of this MOU. These meetings will also serve as coordination sessions to determine immediate and future timing requirements and the general programming of cooperative actions.

iii. Implement the state consultation requirements of BLM NV Instructional Memorandum No. 2012-058 through this MOU for mining projects. This MOU provides that the consultation process will involve a collaborative approach among the Parties on a project basis.

iv. Support and implement appropriate sage-grouse monitoring and mitigation for mining related activities in PPH and PGH on federal lands. Through the NEPA process for Plans of Operation or through the development of mining exploration Notices of Intent, the Agencies will consult with the Parties to identify and implement appropriate monitoring and mitigation for mining exploration and development on BLM and HTNF lands in Nevada, consistent with the interim management direction for PPH and PGH. The goals for project development include, but are not limited to: (a) Avoidance and minimization of sage-grouse habitat disturbance where practicable, recognizing existing mineral rights and authorizations; (b) Offsetting, or mitigation where avoidance is not practicable; and (c) Establishment of sage-grouse mitigation bank(s).

v. For mining projects on federal lands not previously approved by the appropriate Agency, provide for restoration, mitigation, or offsetting of potential impacts on sage-grouse. The final determination of the effects that require restoration, mitigation, and offsetting shall be accomplished through site specific analysis and/or addressed in a NEPA compliant document. In determining any requirements, the Agencies shall consider the recommendations of an evaluation committee consisting of representatives of the project, the federal land management agency, and the State Sage-Grouse Technical Team. Such determinations shall be guided by the following principles:

a. No restoration, mitigation, or offset would be required where site specific analysis establishes that there will be no negative effects to sage-grouse or its habitat, even in areas that have been designated on maps as PPH or PGH. Such analysis would be conducted by a qualified biologist with sage-grouse experience and agreed to by the relevant Parties. The analysis would include an evaluation of the use of the site by sage-grouse during its life cycle. In order to reach a conclusion that no restoration, mitigation, or offsetting is required in an area previously designated as PPH or PGH, the analysis must be conducted prior to any disturbance and must account for any projected changes in sage-grouse behavior as a result of the activity proposed. Attachment A (Sage-Grouse Habitat Assessment Framework) hereto describes one acceptable approach to such site-specific analysis. Other methods or procedures, including without limitation streamlining of data requirements, may be considered on a case-by-case basis.

b. Site reclamation plans may include specific measures designed to provide for restoration/rehabilitation or improvement of sage-grouse habitat during the reclamation process. Where such reclamation is found to adequately address some or all of the impacts on Greater sage-grouse, the required mitigation or offsetting may be reduced or eliminated.

c. Where reclamation is infeasible or will not, by itself, adequately address all impacts on Greater Sage-grouse, any excess impact not addressed by reclamation will be offset or mitigated as provided in a plan approved by the appropriate federal Party, consistent with the objective of no unmitigated net loss and the following principles:

i. Offset at a ratio of 1 to 1 by providing long-term assurances, acceptable to the land management agency and in place prior to the disturbance, for the protection, management, and conservation of comparable habitat on private land. For purposes of this Agreement, "comparable" shall refer to habitat of the same (or better) kind and quality, to the satisfaction of the land management agency.

ii. Mitigated by the project proponent at ratios of no more than 3 to 1 for PPH-quality habitat and 2 to 1 for PGH-quality habitat. Notwithstanding these mitigation targets, it is understood and agreed that the Agencies may approve alternative mitigation proposals where the net benefit to sage-grouse conservation meets or exceeds the benefit that would be achieved by performing traditional acre for acre mitigation. For example, but without limitation, it is agreed that fire control, focused improvements to high value habitat areas, and other projects may have great benefit to sage-grouse that is not easily correlated to per acre mitigation ratios.

iii. Mitigated by the project proponent providing payment to a sage-grouse mitigation bank account or other program approved by DCNR and the appropriate federal land management agency in an amount equal to the cost of satisfying the target mitigation ratios set forth above. Costs for making such improvements on private lands shall be based on the Nevada Standardized Reclamation Cost Estimator (SCRE) model. SCRE shall also provide the basis for negotiating costs for public lands, which will also include cost of NEPA compliance.

iv. Without limitation, mitigation measures may include habitat restoration/rehabilitation, vegetation management, fencing of springs and meadows, thinning or removal of woodland vegetation in sagebrush communities, creating fuel breaks to protect intact sagebrush communities, noxious weed treatments, and supplemental (*i.e.*, not baseline) GPS or telemetry sage-grouse population monitoring. Mitigation/offsetting may be performed on or off-site, on either private or public lands, subject to appropriate mechanisms for assuring that off-site mitigation projects will maintain adequate protections.

vi. Continue to work toward development of a program for and establishment of a sage-grouse mitigation bank(s) across all land ownerships and jurisdictions. The Parties will identify potential habitat to be included in a mitigation bank(s); a program for implementing restoration/rehabilitation, reclamation, and enhancement activities on banked land; a system for validating, tracking, and monitoring the success of mitigation efforts on Greater Sage-grouse populations; mechanisms for assuring adequate protection of projects; and an accounting system for banked credits.

vii. Support the development and application of state and transition models for ecological sites to assess Greater Sage-grouse habitat values and optimize Greater Sage-grouse restoration/rehabilitation, reclamation, and enhancement efforts. Modeling will be used, if available, during the NEPA process and during consultation with the Parties to assess habitat disturbance and identify appropriate mitigation measures. Modeling may also be used to identify potential land for a mitigation bank(s) and provide a metric for assigning values to habitat restoration/rehabilitation, reclamation, and enhancement activities within the bank(s).

viii. Greater Sage-grouse related data that becomes available through site-specific surveys, remote sensing data, state and transitional models, or other sources will be provided to and stored in a central location acceptable to the relevant Parties. The appropriate protocols and location of the data storage will be coordinated by the State Sage-Grouse Technical Team.

ix. Consistent with this MOU, offsetting/mitigation, including any monitoring or other requirements, to address impacts to Greater Sage-grouse from mining projects on federal lands will be developed through the NEPA process and issued as a condition of project approval.

III. AUTHORITIES

A. The following Legislative Authorities apply to the BLM and will apply to other subsequent and mutually agreed to instruments:

i. The Taylor Grazing Act of June 28, 1934, (43 U.S.C. § 315 *et seq.*), as amended.

ii. General Mining Law of 1872 (30 U.S.C. § 22 *et seq.*), as amended.

iii. The Federal Land Policy and Management Act of 1976 (43 U.S.C. § 1737(b)).

iv. The Public Rangelands Improvement Act of 1978 (43 U.S.C. § 1901 *et seq.*).

v. National Environmental Policy Act of 1969 (42 U.S.C. § 4321 *et seq.*).

B. The following Legislative Authorities apply to the HTNF and will apply to other subsequent and mutually agreed to instruments:

i. National Forest Management Act of 1976 (16 U.S.C. §§ 1600-1614), as amended.

ii. General Mining Law of 1872 (30 U.S.C. § 22 *et seq.*), as amended.

iii. The Federal Land Policy and Management Act of 1976 (43 U.S.C. § 1737(b)),

iv. National Environmental Policy Act of 1969 (42 U.S.C. § 4321 *et seq.*).

C. The following Legislative Authorities under this MOU apply to DCNR, for its participation as a NEPA cooperating agency, and to the Companies for participation as project applicants: NRS 232.070(3).

IV. ADMINISTRATION

A. It is mutually agreed and understood by all Parties that:

i. Nothing in this MOU will be construed as affecting or restricting the legal authorities of the Parties or as binding beyond their respective authorities, or to obligate the federal agencies to any current or future expenditure in advance of appropriations from Congress. Nor does this agreement obligate or require the United States, through BLM or NTNF, or the State of Nevada to expend funds on any particular project or purpose, even if funds are available.

ii. Any information furnished to the BLM, HTNF, or other Parties during and related to the NEPA process may be subject to disclosure under the Freedom of Information Act (5 U.S.C. § 552), unless covered by a relevant exception (e.g., for confidential commercial or financial information (5 U.S.C. § 552(b)).

iii. This MOU in no way restricts the BLM, HTNF, DCNR, or the Companies from participating in similar activities with other public or private agencies, organizations, and individuals.

iv. Nothing in this MOU shall obligate the BLM, HTNF, DCNR, or the Companies to obligate or transfer any funds. Specific work projects or activities that involve the transfer of funds, services, or property among the various agencies and offices of the BLM, HTNF, DCNR, and the Companies shall require execution of separate agreements consistent with law and any funds provided by the government agencies pursuant to their legal authorities will be contingent upon the availability of appropriated funds. All funded activities must be independently authorized by appropriate statutory authority as this MOU does not provide such authority. Negotiation, execution, and administration of each such agreement must comply with all applicable statues and regulations.

v. This MOU is not intended to and does not create, any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity, by a party against the United States, its agencies, its officers, or against the State of Nevada or any other person.

vi. Conflicts between the Parties concerning procedures under this MOU, which cannot be resolved at the operational level, will be referred to successively higher levels as necessary for resolution.

vii. Upon request by any of the Parties, each Party shall review this MOU to assure that it continues to reflect the appropriate understandings and procedures to provide for current needs and capabilities and adherence to the Public Laws.

viii. The terms of this MOU may be renegotiated at any time at the initiative of any Party. Any Party may propose changes to this MOU during its term by providing 30-day written notification to the other Parties. Such changes will be in the form of an amendment and will become effective upon signature by the Parties.

ix. The Federal Government's liability shall be governed by the provisions of the Federal Tort Claims Act (28 U.S.C. §§ 2671-80). The Parties shall operate in conformance with the Code of Federal Regulations and the United States Code.

x. The Parties shall comply with all Federal Statutes relating to nondiscrimination. These include but are not limited to: a) Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d), which prohibits discrimination on the basis of race, color, handicap, or national origin; b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§ 1681-16783, §§ 1685-1686), which prohibits discrimination on the basis of sex.

xi. Any Party may terminate its involvement under this MOU upon providing a 30-day written notice of such termination to the other Parties.

xii. Unless otherwise provided, this agreement is not intended to supersede provisions of other agreements between the Parties, in whole or in part, unless there is a conflict between the two agreements.

xiii. FEDERAL IDENTIFIER NUMBER. For the purposes of the HTNF, the Federal Identifier Number is **13-MU-11041730-040**.

xiv. SUPPLEMENTAL PROVISIONS. The U.S. Forest Service (HTNF) Supplemental Provisions are hereby incorporated into and made part of the Memorandum of Understanding among the BLM, HTNF, DCNR, and the Companies regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat.

xv. NON-FEDERAL STATUS FOR COOPERATOR PARTICIPANT LIABILITY. DCNR and the Companies agree that any of their employees, volunteers, and program participants shall not be deemed to be Federal employees for any purposes including Chapter 171 of Title 28, United States Code (Federal Tort Claims Act) and Chapter 81 of Title 5, United States Code (OWCP), as DCNR and the Companies hereby willingly agree(s) to assume these responsibilities.

Further, DCNR and the Companies shall provide any necessary training to DCNR and the Companies' employees, volunteers, and program participants to ensure that such personnel are capable of performing tasks to be completed. DCNR and the Companies shall also supervise and direct the work of its employees, volunteers, and participants performing under this agreement.

xvi. ASSURANCE REGARDING FELONY CONVICTION OR TAX DELINQUENT STATUS FOR CORPORATE ENTITIES. This agreement is subject to the provisions contained in the Department of Interior, Environment, and Related Agencies Appropriations Act, 2012, P.L. No. 112-74, Division E, Section 433 and 434 regarding corporate felony convictions and corporate federal tax delinquencies. Accordingly, by entering into this agreement the Companies acknowledges that it: 1) does not have a tax delinquency, meaning that it is not subject to any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, and (2) has not been convicted (or had an officer or agent acting on its behalf convicted) of a felony criminal violation under any Federal law within 24 months preceding the agreement, unless a suspending and debarring official of the United States Department of Agriculture has considered suspension or debarment is not necessary to protect the interests of the Government. If any of the signatory mining Companies fails to comply with these provisions, the U.S. Forest Service will annul this agreement and may recover any funds the Companies have expended in violation of sections 433 and 434.

xvii. MEMBERS OF U.S. CONGRESS. Pursuant to 41 U.S.C. 22, no U.S. member of, or U.S. delegate to, Congress shall be admitted to any share or part of this agreement, or benefits that may arise therefrom, either directly or indirectly.

xviii. NOTICES. Any communications affecting the operations covered by this agreement given by the U.S. Forest Service or the Parties is sufficient only if in writing and delivered in person, mailed, or transmitted electronically by e-mail or fax, as follows:

To the Principal Contact(s) listed in Section IV(A)(xxii).

Notices are effective when delivered in accordance with this provision, or on the effective date of the notice, whichever is later.

xix. DEBARMENT AND SUSPENSION. The Cooperator shall immediately inform the U.S. Forest Service if they or any of their principals are presently excluded, debarred, or suspended from entering into covered transactions with the federal government according to the terms of 2 CFR Part 180. Additionally, should the Cooperator or any of their principals receive a transmittal letter or other official Federal notice of debarment or suspension, then they shall notify the U.S. Forest Service without undue delay. This applies whether the exclusion, debarment, or suspension is voluntary or involuntary.

xx. This MOU documents a framework for cooperation between the HTNF and the other Parties for carrying out their separate activities in a coordinated and mutually beneficial manner where nothing of value transfers between the Parties. The Parties direct their own activities, use their own resources and funding, and do not expect any deliverable by the HTNF and the other Parties. Nothing in this MOU commits the HTNF to future projects or any future obligation.

xxi. ENDORSEMENT. Any of the Parties' contributions made under this MOU do not by direct reference or implication convey U.S. Forest Service endorsement of the Parties' products or activities.

xxii. PRINCIPAL CONTACTS. Individuals listed below are authorized to act in their respective areas for matters related to this agreement.

Principal DCNR Contacts:

DCNR Program Contact	DCNR Administrative Contact
Name: Jim Lawrence Address: 901 S Stewart St, Suite 5003 City, State, Zip: Carson City, NV 89701 Telephone: 775-684-2720 FAX: Email: Lawrence@lands.nv.gov	Name: Tim Rubald Address: 901 S. Stewart St, Suite 1003 City, State, Zip: Carson City, NV 89701 Telephone: 775-684-2764 FAX: Email: timrubald@sagebrusheco.nv.gov

Principal BLM Contacts:

BLM Program Contact	BLM Administrative Contact
Name: Raul Morales Address: 1340 Financial Blvd City, State, Zip: Reno, NV 89502 Telephone: 775-861-6464 FAX: 775-861-6712 Email: rmorales@blm.gov	Name: Kenda Tucker Address: 1340 Financial Blvd City, State, Zip: Reno, NV 89502 Telephone: 775-861-6417 FAX: 775-861-6634 Email: ktucker@blm.gov

Principal Companies Contacts:

Companies Program Contact	Companies Administrative Contact
Name: Tim Crowley, President, Nevada Mining Association Address: 201 West Liberty St City, State, Zip: Reno, NV 89501 Telephone: 775-829-2121 FAX: 775-852-2631 Email: Tim@nevadamining.org	Name: Address: City, State, Zip: N/A Telephone: FAX: Email:

Principal HTNF Contacts:

HTNF Program Manager Contact	HTNF Administrative Contact
Name: Tom Frolli, Natural Resources & Planning Officer Address: 1200 Franklin Way City, State, Zip: Sparks, NV 89431 Telephone: 775-355-5313 FAX: 775-355-5398 Email: tfrolli@fs.fed.us	Kevin Worth, Grants Management Specialist Southwest ID & NV Acquisition Center 1249 S Vinnell Way, Suite 200 Boise, ID 83709 Telephone: (208) 373-4295 FAX: (208) 373-4294 Email: kworth@fs.fed.us

The authority and format of this agreement have been reviewed and approved for signature. 13-MU-11041730-040

7/8/13

KEVIN WORTH
U.S. Forest Service Grants Management Specialist

Date

V. APPROVALS

This MOU will become effective upon the last date of signature between the Parties and shall remain in effect for 5 years or until the issuance of a Record of Decision approving BLM and HTNF's California-Nevada Greater Sage-Grouse Sub-regional Resource Management Plan Amendments, as contemplated by IM No. 2012-044, whichever is sooner. ***This MOU may be amended to include additional participating Companies as deemed appropriate by the signatory agencies.***

7/8/13

Amy Lueders
State Director, Nevada
Bureau of Land Management

Date

William Dunkelberger
Forest Supervisor, Humboldt-Toiyabe National Forest
United States Forest Service

Date

Leo Drozdoff
Director
Nevada Department of Conservation and Natural Resources

Date

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Amy Lueders
State Director, Nevada
Bureau of Land Management

Date

Jack R Isaacs

7/18/13

for William Dunkelberger
Forest Supervisor, Humboldt-Toiyabe National Forest
United States Forest Service

Date

Leo Drozdoff
Director
Nevada Department of Conservation and Natural Resources

Date

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7/8/13

KEVIN WORTH — Date
U.S. Forest Service Grants Management Specialist

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Amy Lueders — Date
State Director, Nevada
Bureau of Land Management

William Dunkelberger — Date
Forest Supervisor, Humboldt-Toiyabe National Forest
United States Forest Service

Leo Drozdoff — 7/9/13
Leo Drozdoff — Date
Director
Nevada Department of Conservation and Natural Resources

S. Hal July 24/13

Gary Halverson Date
President
Barrick Gold of North America

Tom Kerr Date
Senior Regional Vice President – North American Region
Newmont USA Limited

Gary Halverson
President
Barrick Gold of North America

Date

Tom Kerr
Senior Regional Vice President – North American Region
Newmont USA Limited

07-15-13
Date

AUTHORIZED REPRESENTATIVE. By signing below, the President of the Nevada Mining Association (NvMA) certifies as being an authorized representative to sign on behalf of all members of NvMA who shall be and are a participating party to this Memorandum of Understanding (MOU), FS Agreement #13-MU-11041730-040. It shall be the responsibility of the President of NvMA to maintain a current and accurate list of the legal names of all members of NvMA who are a participating party to this MOU. At the request of a party to this MOU, the President of NvMA shall provide that party with a current and accurate list of the legal names of all members of NvMA who are a participating party to this MOU within 30 days of such request.

Tim Crowley

TIM CROWLEY, President
Nevada Mining Association

8-21-13
Date