United States Department of the Interior

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TAKE PRIDE IN AMERICA

In Reply Refer to:
N-086324
3809/1792(NVW0100.34)

Dear Reader:

The Bureau of Land Management (BLM), Winnemucca District (WD), Humboldt River Field Office has completed Newmont Mining Corporation's (NMC)'s "Sandman Exploration Project" Preliminary Environmental Assessment (EA). The EA analyzes the impacts associated with NMC's "Sandman Exploration Project" Plan of Operations (Plan) (BLM record N-086324). The proposed action would be to expand notice-level and state reclamation permit activities located about 14 miles west to northwest of Winnemucca, Nevada.

NMC proposes to expand their existing exploration activities to include an additional 441.2 acres of surface disturbance, for a total disturbance of 500 acres, which includes public and private lands located in part or all of Township 37 North, Range 35 East (T37N, R35E), sections 11-15, 22-26, and 36, T37N, R36E, sections 7, 18-20, 22, and 27-33, T36N, R35E, sections 12, 23, and 24, and T36N, R36E, sections 4-9, 13, 17-24, 26, 27, 29, and 30, Mount Diablo Base and Meridian, Humboldt County, Nevada (Project Area).

You are invited to submit substantive comments on the preliminary EA through April 14, 2010. A copy of the EA is available on our National Environmental Policy Act (NEPA) webpage at www.blm.gov/nv/st/en/fo/wfo/blm_information/nepa0.html. Please send written comments to Ms. Kathleen Rehberg, project lead, at the above address or e-mail to wfoweb@nv.blm.gov with "Sandman Project (Rehberg)" in the subject line. In addition, a hardcopy of the EA will be provided upon request, or is available for review at the WD office during the comment period. A copy of the Plan for the project will also be available for review in our office for the same period of time.

Public comments submitted for this project, including names and addresses of commenters, will be available for public review at the WDO during regular business hours 7:30 a.m. to 4:30 p.m., Monday through Friday, except federal holidays. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment -- including personal identifying information -- may be made publicly available at any time. While you can ask us in your comment to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.

After the public review period has ended, comments will be analyzed and considered as part of the decision-making process. If you have any questions, please contact Kathleen Rehberg at (775) 623-1739 or at the above address.

Sincerely,

Michael J. Zielinski
Acting Field Manager
Humboldt River Field Office

PRELIMINARY ENVIRONMENTAL ASSESSMENT

DOI-BLM-NV-W010-2010-0005

Sandman Exploration Project

March 2010

Prepared by:

U.S. Bureau of Land Management
Winnemucca District Office
5100 E. Winnemucca Blvd.
Winnemucca NV 89445-2921

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

BLM/NV/WM/EA-10/17+1792

DOI-BLM-NV-W010-2010-0005

SANDMAN EXPLORATION PROJECT
HUMBOLDT COUNTY, NEVADA

Preliminary
Environmental Assessment
EA#: NV-W010-2010-0005

March 2010

U.S. Department of the Interior
Bureau of Land Management
Winnemucca District Office
Humboldt River Field Office

NEWMONT MINING CORPORATION
SANDMAN EXPLORATION PROJECT
HUMBOLDT COUNTY, NEVADA
ENVIRONMENTAL ASSESSMENT

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ACRONYMS

ACEC	Area of Critical Environmental Concern
acft/yr	acre-feet per year
APE	Area of Potential Effect
amsl	above mean sea level
BAPC	Bureau of Air Pollution Control
BLM	Bureau of Land Management
BMPs	Best Management Practices
BMRR	Bureau of Regulation and Reclamation
CEQ	Council on Environmental Quality
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
L_{dn}	Day-Night Level
dB	decibel
˚F	Degrees Fahrenheit
EA	Environmental Assessment
EMA	Environmental Management Associates
ENM	Environmental Noise Model
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
GAP	GAP Analysis Project
GBBO	Great Basin Bird Observatory
H	Horizontal
HUC	Hydrologic Unit Code
ID Team	Interdisciplinary Team
IM	Information Memorandum
Ma	Million years ago
MBTA	Migratory Bird Treaty Act
MDB&M	Mount Diablo Base and Meridian
MFP	Management Framework Plan
MOU	Memorandum of Understanding
mph	Miles per hour
MSDS	Material Safety Data Sheets
MSHA	Mine Safety and Health Administration
MT	Master Title
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NLRC	Nevada Land and Resource Company
NMC	Newmont Mining Corporation
NNHP	Nevada Natural Heritage Program
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NSAAQS	Nevada State Ambient Air Quality Standards
NSPL	National System of Public Lands
PFR	Permit for Reclamation
PFYC	Potential Fossil Yield Classification

Plan	Plan of Operations
$PM_{2.5}$	Particulate matter of aerodynamic diameter less than 2.5 micrometers
PM_{10}	Particulate matter of aerodynamic diameter less than 10 micrometers
PMU	Population Management Unit
PSD	Prevention of Significant Deterioration
RC	Reverse Circulation
RFFA	Reasonably foreseeable future actions
ROW	Right-of-Way
SAD	Surface Area Disturbance
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V	Vertical
VRM	Visual Resource Management

NEWMONT MINING CORPORATION
SANDMAN EXPLORTION PROJECT
ENVIRONMENTAL ASSESSMENT

1 INTRODUCTION / PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

The Sandman Exploration Project (Project) is located north of Interstate 80 (I-80) approximately 7.5 miles west of Winnemucca, Nevada (Figure 1.1.1). The southern end of the Project covers the gentle southwest-facing slopes of Abel Flat between Blue Mountain and the Krum Hills. The Project extends north over hills and sand dunes between the Desert and Silver State Valleys south of the Slumbering Hills. The Project Area encompasses approximately 27,588 acres and ranges in elevation from 4,175 to 5,225 feet above mean sea level (amsl), with an average elevation of approximately 4,515 feet amsl. The Project would consist of approximately 500 acres of surface disturbance located on 13,485 acres of National System of Public Lands (NSPL) administered by the Bureau of Land Management Winnemucca District Office, Humboldt River Field Office (BLM) and on 14,103 acres of private land (Figure 1.1.2).

Newmont Mining Corporation (NMC) has been conducting mineral exploration activities on NSPL within the Project Area under nine notices filed with the BLM Humboldt River Field Office: 1) Silica Ridge Notice #N-78528; 2) South Pediment Notice #N-78520; 3) Slumbering Knolls Notice #N-83020; 4) Sandman Notice #N-75578; 5) North Pediment Notice #N-84713; 6) North Hills Notice #N-80633; 7) Basalt Hills Notice #N-78519; 8) Abel Knoll Notice #N-78517 (expired); and 9) Tenmile Notice #N-80634 (Notices). NMC is also conducting State of Nevada permitted exploration and reclamation on private and NSPL within the Project Area under Permit for Reclamation (PFR) No. 0276 (Abel Knoll) and PFR No. 0267 (Southeast Pediment). The Sandman Exploration Project Plan of Operations N-086324 (Plan) and PFR No. 0303 was submitted in September 2008 to the BLM and the Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) in accordance with 43 Code of Federal Regulations (CFR) 3809 and the Nevada Administrative Code (NAC) 519A, reclamation regulations. Finally, NMC is conducting exploration activities on privately owned lands within the Project Area that do not create sufficient surface disturbance to require a permit from the BMRR. NMC currently has approximately 58.8 acres of existing/authorized surface disturbance under the Notices on public land and on private land within the Project Area (Figure 1.1.2). NMC proposes to expand the existing exploration activities on both private and public land to include an additional 441.2 acres of surface disturbance.

NMC proposes the following expanded exploration activities within the 27,588-acre Project Area (Proposed Action): drill site and sump construction; road construction; trenching; bulk sampling; overland travel; existing road maintenance; and the construction and operation of monitoring wells. The Proposed Action would take place in a phased manner over a five-year time frame. One staging area located on private land would be used for the storage of drilling supplies, equipment, and Project management office space (Figure 1.1.2). The use of the staging areas would be conducted consistent with the requirements of 43 CFR 3715 and would be in place for the duration of the Project. NMC may also store equipment and supplies at other sites located on private lands within the Project Area. This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA) to examine the effects of the Proposed Action.

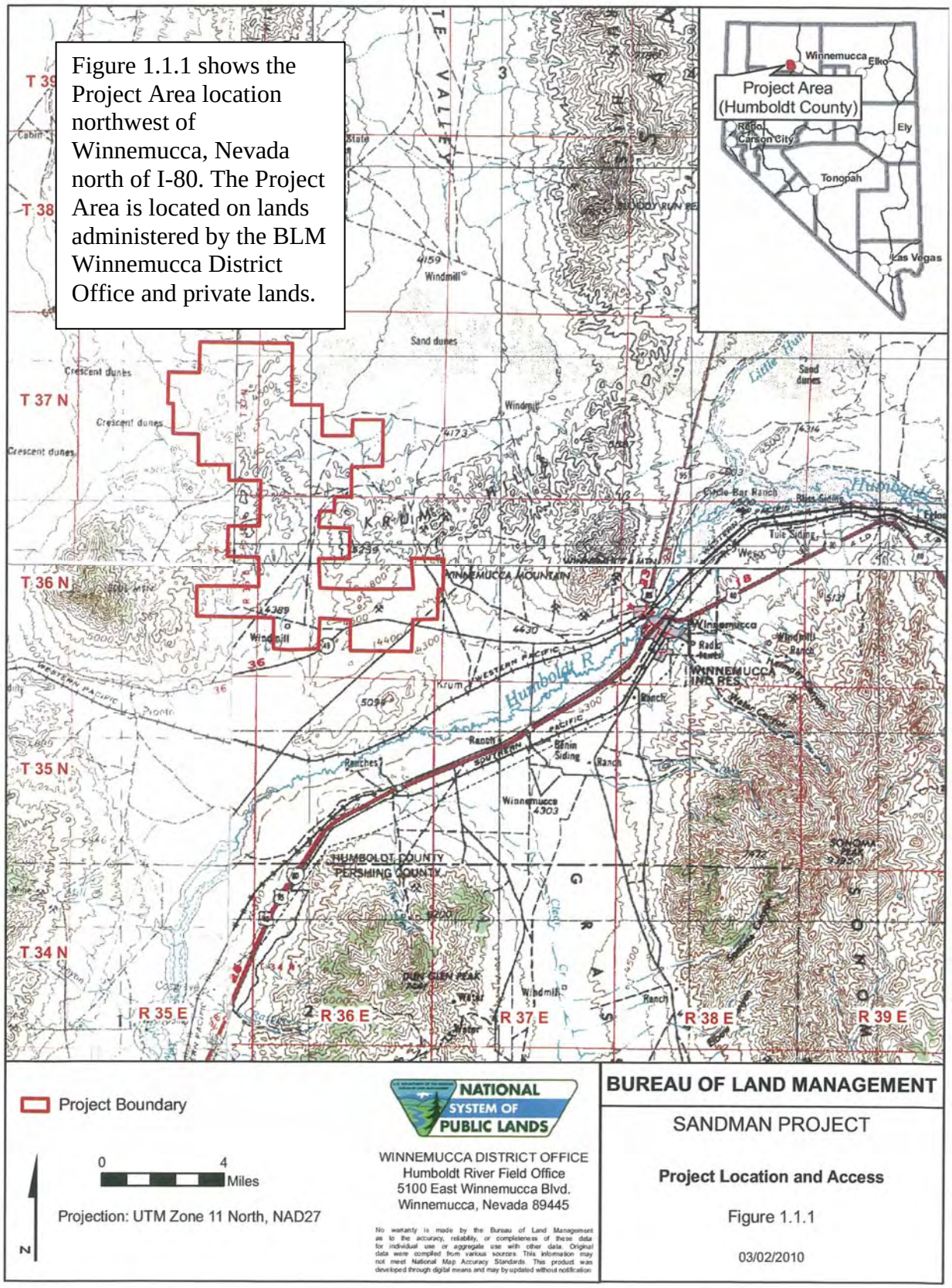


Figure 1.1.1 shows the Project Area location northwest of Winnemucca, Nevada north of I-80. The Project Area is located on lands administered by the BLM Winnemucca District Office and private lands.
Project Area (Humboldt County)
Winnemucca
Elko
Ely
Carson City
Tonopah
Las Vegas
T 37 N
T 36 N
T 35 N
T 34 N
R 35 E
R 36 E
R 37 E
R 38 E
R 39 E
Sand dunes
Crescent dunes
Windmill
WINNEMUCCA MOUNTAIN
Humboldt R
WINNEMUCCA IND RES
HUMBOLDT COUNTY
PERSHING COUNTY
Project Boundary
0
4
Miles
Projection: UTM Zone 11 North, NAD27
N
NATIONAL SYSTEM OF PUBLIC LANDS
WINNEMUCCA DISTRICT OFFICE
Humboldt River Field Office
5100 East Winnemucca Blvd.
Winnemucca, Nevada 89445
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 by updated without notification.
BUREAU OF LAND MANAGEMENT
SANDMAN PROJECT
Project Location and Access
Figure 1.1.1
03/02/2010

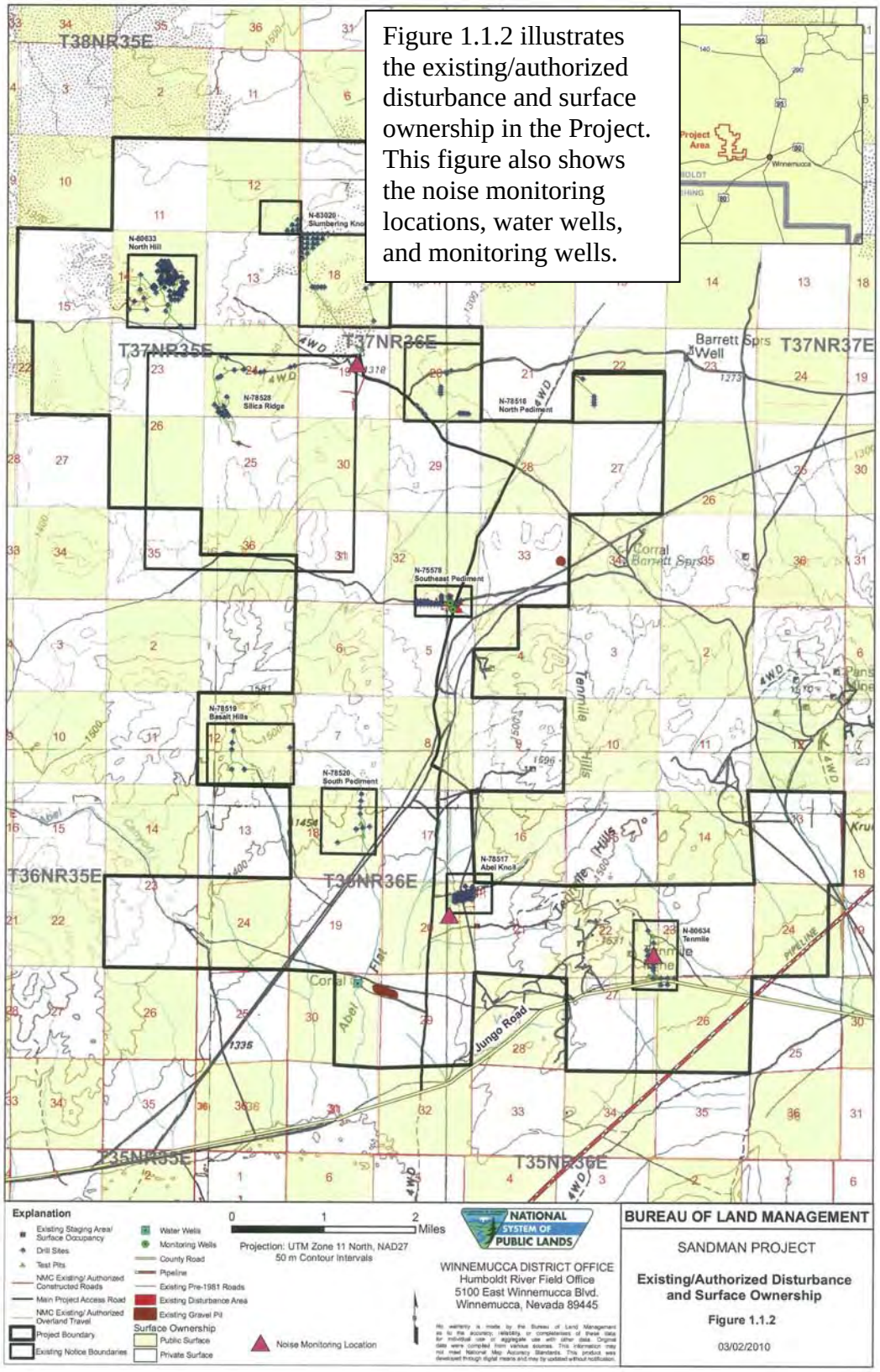


Figure 1.1.2 illustrates the existing/authorized disturbance and surface ownership in the Project. This figure also shows the noise monitoring locations, water wells, and monitoring wells.
T38NR35E
T37NR35E
T37NR36E
T37NR37E
T36NR35E
T36NR36E
T35NR35E
T35NR36E
N-80633 North Hill
N-83020 Slumbering Knoll
N-78528 Silica Ridge
N-78518 North Pediment
N-75578 Southeast Pediment
N-78519 Basalt Hills
N-78520 South Pediment
N-78517 Abel Knoll
N-80634 Tenmile
Barrett Sprs Well
Corral Barrett Sprs
Corral
Project Area
Winnemucca
Tenmile Hills
Abel Flat
Jungo Road
PIPELINE
Explanation
Existing Staging Area/ Surface Occupancy
Drill Sites
Test Pits
NMC Existing/ Authorized Constructed Roads
Main Project Access Road
NMC Existing/ Authorized Overland Travel
Project Boundary
Existing Notice Boundaries
Water Wells
Monitoring Wells
County Road
Pipeline
Existing Pre-1981 Roads
Existing Disturbance Area
Existing Gravel Pit
Surface Ownership
Public Surface
Private Surface
Noise Monitoring Location
0 1 2 Miles
Projection: UTM Zone 11 North, NAD27
50 m Contour Intervals
NATIONAL SYSTEM OF PUBLIC LANDS
WINNEMUCCA DISTRICT OFFICE
Humboldt River Field Office
5100 East Winnemucca Blvd.
Winnemucca, Nevada 89445
BUREAU OF LAND MANAGEMENT
SANDMAN PROJECT
Existing/Authorized Disturbance and Surface Ownership
Figure 1.1.2
03/02/2010

1.2 Purpose and Need

The purpose of this action is to provide NMC the opportunity to conduct mineral exploration including construction of exploration roads, drill sites and sumps, bulk sampling, trenching, overland travel, the maintenance of existing roads, and the construction and operation of monitoring wells, necessary to verify the mineral resources and conduct baseline studies.

The need for action is established by the BLM's responsibility under its 2008 Energy and Mineral Policy, the Federal Land Policy and Management Act of 1976 (FLPMA), and BLM Surface Management Regulations at 43 CFR 3809, to respond to an exploration plan of operations and to take any action necessary to prevent unnecessary or undue degradation of the lands.

1.3 Land Use Conformance Statement

The Proposed Action described in this EA is in conformance with the Paradise-Denio Management Framework Plan (MFP) (BLM 1982), which states that the BLM should "make no land use decisions that would interfere with mineral development in areas (mining districts) of significant current and past mining activity."

1.4 Relationship to Laws, Regulations, and Other Plans

On lands open to location under the General Mining Law of 1872, as amended (Mining Law), the BLM administers the surface acres of public land and federal subsurface mineral estates under the Mining Law and the FLPMA. FLPMA also governs the BLM's administration of public lands not open to location under the Mining Law.

Although the zoning for federal lands is not shown in the Humboldt County Regional Master Plan (Humboldt County 2002), the Project Area is located on BLM land which is zoned M3 - open space which is consistent with the Proposed Action.

1.5 Issues

An interdisciplinary (ID) team meeting was held at the BLM office in Winnemucca on May 20, 2009. During the meeting, the ID team identified the resources to be addressed in this document as outlined in Chapter 3. A scoping letter was sent to the public by the BLM on August 13, 2009. The following general concerns related to the Proposed Action were identified by the BLM and the public in the following areas:

- Air Quality – Project emissions from road construction activities, drilling, and travel in the Project Area may affect air quality. Fugitive dust from travel on Jungo Road may affect air quality.
- Cultural Resources – Project activities may damage eligible or unevaluated sites.
- Migratory Birds – Project activities may affect migratory birds through the removal of vegetation or by construction activities during nesting season.
- Native American Concerns – The Project may affect traditional cultural properties.
- Public Access and Land Use – Project activities could affect public access to portions of the Project Area and create temporary changes to land use.

- Public Safety – The Project may impact public safety through increased travel a fugitive dust on public roadways or create safety hazards during exploration activities.
- Vegetation – The Project could affect vegetation communities and wildlife habitat.
- Visual Resources – The Project may affect the line, texture, or form of the landscape or create issues associated with lighting for Winnemucca or nearby residents when exploration activities occur at night.
- Noise – Project activities may create noise that could disturb residents in the area.
- Paleontology – The Project activities may impact significant paleontological resources.
- Range Resources – The Project may affect range improvements or grazing allotments.
- Recreation – Project activities may affect dispersed recreation or block access roads in the Project Area.
- Social and Economic Values – The temporary workforce may affect Humboldt County by using facilities located in the county.
- Soils – The Project activities may affect soils through compaction or erosion by wind and water.
- Water Quality – The Project activities may affect surface water through construction activities and erosion.
- Wetlands and Riparian Zones – Project activities may affect wetlands and riparian zones through removal of sensitive habitat or erosion.
- Wildlife – The Project activities may affect wildlife habitat through removal of vegetation or cause wildlife to leave the Project Area because of noise or other activities.

2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Proposed Action

The Proposed Action consists of expanding the existing Notice-level exploration activities on public land and authorized exploration activities on private land within the 27,588-acre Project Area. Expanded exploration activities would include the construction of exploration roads, drill sites and sumps, bulk sampling, trenching, overland travel, the maintenance of existing roads, and the construction and operation of monitoring wells. The Proposed Action would increase the existing/authorized Notice-level surface disturbance of 58.8 acres to a total of 500 acres. Figure 1.1.2 shows the existing disturbance. The increased amount of disturbance would occur in phases over a five-year period. Project activities would be located on lands administered by the BLM and on privately owned land. Surface disturbance beyond Phase I cannot be specified at this time because the specific locations for the proposed activities would be based on the results of previous phases of the Project. The existing/authorized and proposed surface disturbance is outlined by type of activity in Table 2.1-1.

Table 2.1-1: Acreage of Approved Existing and Proposed Project Disturbance

Exploration Activity	Land Status	Existing/ Authorized Disturbance Acres	Proposed		Total Disturbance* Acres Analyzed in EA
			Proposed Phase I Acres	Subsequent Phases Acres	
Constructed Roads	Public	3.4	50.0	30.0	83.4
	Private	6.7	50.0	30.0	86.7
Constructed Drill Sites (includes sumps and spoil piles)	Public	13.0	55.0	28.9	96.9
	Private	18.5	55.0	29.0	102.5
Overland Travel	Public	6.8	20.0	20.0	46.8
	Private	2.9	20.0	19.5	42.4
Temporary Structures/Staging Areas (Fencing)/Wells	Public	0.0	2.0	10.0	12.0
	Private	0.3	2.0	1.8	4.1
Bulk Sample Excavations and/or Trenches	Public	2.7	2.0	7.0	11.7
	Private	4.5	2.0	7.0	13.5
Total Existing/Authorized & Proposed Acres (Public)		**25.9**	**129.0**	**95.9**	**250.8**
Total Existing/Authorized & Proposed Acres (Private)		**32.9**	**129.0**	**87.3**	**249.2**
Total Disturbance Acres Analyzed		**58.8**	**258**	**183.1**	**500.0**

*Individual components are rounded to nearest tenth of an acre, which results in a difference between the total and the sum of the components.

As outlined in Table 2.1-1, NMC has projected that the total existing/authorized, approved, and proposed surface disturbance would equal approximately 500 acres. By using a phased approach to drilling, NMC would assess the expansion needs of the Project based on current drill results. In order to provide the BLM with relevant information concerning the location and types of

surface disturbance and to avoid sensitive resources under each phase, NMC would provide documentation (i.e., work plans and maps) for the areas of planned exploration prior to commencing exploration activities. The BLM would provide a review of the submittal prior to initiating activities under that phase. In addition, NMC would provide to the BLM and NDEP an annual report on, or before, April 15th of each year that documents surface disturbance locations, types of surface disturbance, and any completed concurrent reclamation.

2.1.1 Location and Access

The Project is located on public lands administered by the BLM and private lands in Township 37 North, Range 35 East (T37N, R35E), part or all of sections 11-15, 22-26, and 36, T37N, R36E, sections 7, 18-20, 22, and 27-33, T36N, R35E, sections 12, 23, and 24, and T36N, R36E, sections 4-9, 13, 17-24, 26, 27, 29, and 30, Mount Diablo Base and Meridian (MDB&M) Humboldt County, Nevada (Project Area). Table 2.1-2 includes the legal description for the Project (Figure 1.1.1). The Project is located on the United States Geological Survey (USGS) 7.5-minute topographic quadrangles Mormon Dan Butte, Rose Creek, Pronto, and Barrett Springs. The Project is accessed by traveling west from Winnemucca, Nevada, on State Route 49 (SR49, Jungo Road) approximately 12 miles to the main Project access road that leads north into the Project Area toward Abel Flat. Access within the Project Area is provided by existing dirt roads, existing Notice-level roads, overland travel, and proposed new road construction (Figure 2.1.1).

Table 2.1-2: Sandman Exploration Project Area Legal Description

Section	Location
T37N, R35E	
11	Portions of: NW¼, SW¼, SE¼, NE¼
12	Portions of: SW¼, NW¼, SE¼, NE¼
13	Portions of: SW¼, NW¼, SE¼, NE¼
14	Portions of: SW¼, NW¼, SE¼, NE¼
15	Portions of: SW¼, NW¼, SE¼, NE¼
22	Portions of: SW¼, NW¼, SE¼, NE¼
23	Portions of: SW¼, NW¼, SE¼, NE¼
24	Portions of: SW¼, NW¼, SE¼, NE¼
25	Portions of: SW¼, NW¼, SE¼, NE¼
26	Portions of: SW¼, NW¼, SE¼, NE¼
36	Portions of: NE¼, SE¼
T37N, R36E	
7	Portions of: NW¼, SW¼, SE¼, NE¼
18	Portions of: SW¼, NW¼, SE¼, NE¼
19	Portions of: SW¼, NW¼, SE¼, NE¼
20	Portions of: SW¼, NW¼, SE¼, NE¼
22	Portions of: SW¼, SE¼,
27	Portions of: SW¼, NW¼, SE¼, NE¼

Section	Location
28	Portions of: SW¼, NW¼, SE¼, NE¼
29	Portions of: NW¼, SW¼, SE¼, NE¼
30	Portions of: SW¼, NW¼, SE¼, NE¼
31	Portions of: SW¼, NW¼, SE¼, NE¼
32	Portions of: SW¼, NW¼, SE¼, NE¼
33	Portions of: SW¼, NW¼, SE¼, NE¼
T36N, R35E	
12	Portions of: SW¼, NW¼, SE¼, NE¼
23	Portions of: SW¼, NW¼, SE¼, NE¼
24	Portions of: SW¼, NW¼, SE¼, NE¼
T36N, R36E	
4	Portions of: NW¼
5	Portions of: SW¼, NW¼, SE¼, NE¼
6	Portions of: SW¼, NW¼, SE¼, NE¼
7	Portions of: SW¼, NW¼, SE¼, NE¼
8	Portions of: SW¼, NW¼, SE¼, NE¼
9	Portions of: SW¼, NW¼, SE¼, NE¼
13	Portions of: SW¼, NW¼, SE¼, NE¼
17	Portions of: SW¼, NW¼, SE¼, NE¼
18	Portions of: SW¼, NW¼, SE¼, NE¼
19	Portions of: SW¼, NW¼, SE¼, NE¼
20	Portions of: SW¼, NW¼, SE¼, NE¼
21	Portions of: SW¼, NW¼, SE¼, NE¼
22	Portions of: SW¼, NW¼, SE¼, NE¼
23	Portions of: SW¼, NW¼, SE¼, NE¼
24	Portions of: SW¼, NW¼, SE¼, NE¼
26	Portions of: SW¼, NW¼, SE¼, NE¼
27	Portions of: SW¼, NW¼, SE¼, NE¼
29	Portions of: SW¼, NW¼, SE¼, NE¼
30	Portions of: SE¼, NE¼

2.1.2 Exploration Drill Sites

Exploratory drilling under the Proposed Action would be conducted in two distinct styles. Initial exploration would include closely spaced drilling in the vicinity of known mineralization to better define the configuration and grade of the mineralization. The areas that would be targeted for this style of exploration are North Hill, Silica Ridge, Southeast Pediment, and Abel Knoll. The second style of exploration drilling would include more widely spaced drilling locations within the remainder of the Project Area. Depending on the progress and results of the more widely spaced exploration, drilling activities may transition to the more targeted style of

exploration in other parts of the Project Area, otherwise concurrent reclamation would occur. This style of exploratory drilling prevents NMC from being able to predict the exact number and location of drill holes that would be drilled over the life of the Project since drilling activities would be contingent upon the results from previous exploration.

Drill sites, when constructed and not overland sites, would each measure approximately 100 feet by 75 feet. NMC would conduct exploration drilling with up to ten drill rigs. Drill holes would be vertical or angled and drilled with a reverse circulation (RC) or core drill rig. Drill holes would have a maximum depth of 1,000 feet and an average depth of 500 feet. If necessary, up to three sumps measuring approximately 35 feet by 20 feet, including the spoil pile, and five feet in depth would be used to trap drill cuttings and manage drill fluids generated during drilling. The sumps would be built with an incline on one end. In addition, sumps would be fenced with orange construction fencing when the drill sites are not occupied. Once the RC and/or core rig has completed drilling the hole, the hole would be plugged. NMC anticipates that up to ten drill holes would remain open after the reverse circulation rig moves off the drill site and until the core rig moves on to the site and then completes the drill hole. The drill holes would be plugged by placing drill cuttings or inorganic fill material into the total depth of the hole, or if ground water is encountered, plugged as a well pursuant to NAC 534.420. Based on previous drilling in the area, the depth to ground water is at approximately 100 feet below the ground surface. If casing is set in a borehole, the borehole must be completed as a well pursuant to the provisions of NAC Chapter 534. The borehole must be plugged pursuant to NAC 534.420, or the casing must be removed from the borehole when it is plugged. The upper portion of the borehole may be permanently cased if the annular space between the casing and the walls of the borehole is completely sealed from the bottom of the casing to the surface pursuant to NAC 534.380.

2.1.3 Trench Construction and Bulk Sampling

Trenching and bulk sampling are part of the Proposed Action. Trenches would be constructed for geologic mapping and collection of bulk samples. The sampling would consist of developing surface excavations and/or trenching. A maximum of 24 excavations would be tested and would be approximately 15 feet wide by 200 feet long and up to five feet deep. The locations of the bulk sampling sites have not yet been identified and would vary based on exploratory drilling results. The trench would be excavated using a small bulldozer or equivalent and would have a temporary 1 horizontal (H):1 vertical (V) slope ratio. Excavated material would be stockpiled along the sides or at the end of the trench.

Growth media (e.g., topsoil and alluvium) would be salvaged and placed in a separate stockpile from the remainder of the excavated material. The growth media would be redistributed after the trench has been refilled to provide enhanced revegetation potential. To prevent access by humans or animals, NMC would erect and maintain an orange barrier fence surrounding open trenches until they are filled and reclaimed.

2.1.4 Constructed Road and Overland Travel

The Proposed Action includes both road construction and overland travel. The estimated disturbance width for overland travel would be six feet. Exploration road construction would require an average estimated disturbance width of 18 feet. Exploration roads that would require earth-moving would be located and constructed using typical construction practices for temporary mineral exploration roads to minimize surface disturbance, erosion, impacts to visual

quality, and to facilitate reclamation. Road grades would be no steeper than ten percent in order to be consistent with the BLM roads manual.

Road construction would take place on both public and private land using a Cat D8L bulldozer or equivalent. Balanced cut and fill construction would be used to the extent practicable to minimize the exposed cut slopes and the volume of fill material. Since the depth of the cut would be kept to a minimum, growth media removed during construction would be stockpiled as the fill slope to be used during reclamation. Road construction within drainages would be avoided where possible. When drainages must be crossed by a road, Best Management Practices (BMPs) established by the NDEP and the Nevada Division of Conservation Districts Handbook of Best Management Practices, adopted by the State Environmental Commission on December 7, 1994, would be followed to minimize the surface disturbance and erosion potential. No culverts would be installed. It is not anticipated that blasting would be necessary for exploration road construction; however, if drilling and blasting should become necessary, prior to blasting the operator would submit an approved safety plan to the BLM and NDEP.

Routine road maintenance may be required and would consist of smoothing ruts, filling holes with fill material, grading, re-establishing waterbars when necessary, and using water trucks to suppress dust. In addition, NMC may need to armor some existing pre-1981 roads and the exploration roads with gravel to minimize excess disturbance and control dust. The gravel would be obtained from existing gravel sources located on private or public lands within the Project Area (Figure 1.1.2) located in T37N, R36E, section 33 and T36N, R36E, sections 29 and 30. The material source on public land is a designated community gravel source. Activities would include the excavation of aggregate material and trucking the material to the roads that need armouring. This could occur anywhere within the Project Area. The material would then be spread on the road using a road grader, bull dozer, or frontend loader. The aggregate mining would occur using a frontend loader or an excavator and the material would be hauled in a dump truck to the sites needing repair or dust suppression. The amount of gravel needed would be dependent on the use of the roads, soil types, and weather conditions. The application of gravel would be on the order of one cubic yard per 100 feet of road; therefore, gravel use on an annual basis may range from ten to ten thousand cubic yards.

Aggregate resources on private lands are not covered by the State of Nevada Reclamation Act and aggregate resources on public lands are covered under a separate regulatory program. NMC may also obtain gravel from sources outside of the Project Area.

2.1.5 Equipment

The following list of equipment is expected to be used at some point in the life of the Project:

Amount	Type of Equipment
Up to 5	RC drill rigs - truck or buggy mounted
Up to 5	Core drill rigs - truck or skid mounted
Up to 10	Water trucks
Up to 10	Pickups or one-ton trucks
Up to 5	Compressor trailers
Up to 5	Auxiliary compressor on trailer
Up to 5	Pipe trailers

Amount	Type of Equipment
Up to 10	Rod trucks
Up to 5	Casing trailers
Up to 5	Mud trailers
Up to 1	Office trailer
Up to 1	Storage trailer
Up to 11	Portable light plants or generators
Up to 5	Portable drilling shelters
Up to 2	Downhole survey trucks
Up to 5	Water tanks
Up to 2	Water pumps on trailers
Up to 2	Service trucks
Up to 3	Crane trucks
Up to 2	Bulldozers
Up to 2	Excavators
Up to 1	Road grader
Up to 1	Dump truck
Up to 2	Backhoes/frontend loaders

Generally, a Cat D8L or equivalent would be used to construct roads and drill sites where needed. Roads and drill sites would be reclaimed using an excavator or a bulldozer and an all-terrain vehicle with a seed broadcaster, or comparable method. NMC would take steps to prevent fires by ensuring that each field vehicle carries hand tools and a fire extinguisher. Water trucks at the Project Area would be used in the event of a fire. All portable equipment, including drill rigs, support vehicles, and drilling supplies, would be removed from the Project Area during extended periods of non-operation.

2.1.6 Water Use

Water would be used under the Proposed Action for dust suppression and during drilling. Up to 30 trips per day would be required to deliver water to the drill sites. Water would be obtained from two existing wells located in the northern and southern portions of the Project Area (Figure 1.1.2). Both wells are accessed via existing roads and include small stock watering ponds. The southern well (T36N, R36E, section 30) is registered with the Nevada State Engineer under water permit number 76366 and NMC has a water right waiver with the Nevada State Engineer under MM-151. NMC has a water right waiver on the northern water well (T37N, R36E, section 19) with the Nevada State Engineer under MM-148. The water use authorized by the Nevada State Engineer would be less than 45,000 gallons per day (annualized average of 36 acre feet).

2.1.6.1 Monitoring Wells

There are currently two monitoring wells located within the Southeast Pediment Exploration Area (Figure 1.1.2) used to collect ground water baseline data. Previous drilling activities within the Project Area have established an estimated ground water depth of approximately 100 feet below the ground surface. NMC proposes to install ten additional monitoring wells under Phase1 of the Proposed Action to track ground water levels and quality. Three of the new monitoring wells would be located in each of the North Hill, Silica Ridge, and Abel Knoll Exploration Areas

under Phase 1 of the Project. NMC also proposes that additional monitoring wells be constructed as needed throughout the Project Area during subsequent phases of exploration. All monitoring and water wells within the Project Area would be plugged in accordance with NAC 534.420. Dewatering pump tests would also be completed, if necessary, to evaluate ground water conditions (e.g., permeability, transmissivity, chemistry) within the aquifers. During the pump test surface water would be discharged to adjacent surface drainages. The pump tests could last up to 30 days.

2.1.7 Work Force

Standard drilling procedures would require that a geologist be on site throughout drilling activities to manage the drill rig, log drill holes, determine maximum drill depth, and advise the drill rig operator as needed. Standard drill rig crews would consist of a drill rig operator and one to two laborers. The drill rig operator would be in charge of the drill rig itself and would make decisions regarding drilling techniques and equipment. Laborers would be responsible for removing and boxing the recovered core samples, removing the cuttings from the drill rigs, mixing drilling fluids in a portable mud tank, operating the water truck, assisting with drilling operations, and conducting maintenance as necessary. Up to a total of 50 individuals (four contract personnel per drill rig crew and one NMC-employed geologist per drill rig for ten drill rigs) may be working at any time under the Proposed Action. Operations would be conducted 24 hours per day, seven days per week, except for brief periods during scheduled drilling breaks.

2.1.8 Surface and Ground Water Control

BMPs for sediment control would be utilized during construction, operation, and reclamation to minimize sedimentation from disturbed areas. The topography of the Project Area is generally described as gently sloping lowland surrounded by low hills. Several small ephemeral drainages traverse the site, primarily in a south to southwesterly direction. Site drainage occurs during precipitation events. Surface water control structures would include, but not be limited to, fabric and/or weed-free straw bale filter fences, siltation or filter berms, mud sumps, and downgradient drainage channels in order to prevent unnecessary or undue degradation to the environment. Sediment traps would be constructed to ensure that drill cuttings are contained.

Surface water drainage control would be accomplished by diverting precipitation event surface flows from the exploration area, isolating runoff, and utilizing appropriate control measures. Proposed road construction would avoid drainages whenever possible. When drainages must be crossed by a road, BMPs would be followed to minimize surface disturbance and erosion potential. Drill cuttings and drill fluids would not be allowed to flow off drill sites. Sumps would be used to collect cuttings and manage drill water and would be filled at the end of drilling activities. The management of drill cuttings would be consistent with BMPs.

None of the drilling products to be used under the Proposed Action contain hazardous substances and all are approved for well drilling and would therefore, not contaminate ground water aquifers or surface waters. Material Safety Data Sheets (MSDS) for common drill additives are included in the Plan.

2.1.9 Solid and Hazardous Materials

All refuse generated by the Project would be disposed of at an authorized, off-site landfill facility consistent with applicable regulations. No refuse would be disposed of on site. Porta potties would be available in the Project Area for use by Project personnel.

Hazardous materials utilized within the Project Area would include diesel fuel, gasoline, and lubricating grease. Approximately 500 gallons of diesel fuel and gasoline would be stored in fuel delivery systems on vehicles and drill rigs. Approximately 100 gallons of gasoline would be stored in fuel delivery systems for light trucks. Approximately 100 pounds of lubricating grease would be stored on the drill rigs or transported by drill trucks. All containers of hazardous substances would be labeled and handled in accordance with Nevada Department of Transportation (NDOT) and Mine Safety and Health Administration (MSHA) regulations. In the event hazardous or regulated materials were spilled, measures would be taken to control the spill, and the BLM and NDEP would be notified as required. Any hazardous substance spills would be handled in accordance with NMC's Spill Prevention Plan which stipulates the immediate clean-up of the spilled substance and any resulting waste (e.g., oil, noxious fluids, chemicals, or contaminated materials) transferred off site in accordance with all applicable federal, state, and local regulations. Contract drill crews would maintain spill kits on site for use in case of a spill.

2.1.10 Reclamation

Reclamation activities within the Project Area are intended to restore the disturbed land to a beneficial land use, prevent unnecessary degradation of the environment, and reclaim disturbed areas to ensure visual and functional compatibility with surrounding areas. Reclamation activities have been developed pursuant to 43 CFR 3809 and NAC 519A. Reclamation activities would be conducted after exploration activities when it has been determined that exploration disturbance is no longer needed. Reclamation would begin at the earliest practicable time within exploration areas that have been deemed inactive, without potential, or completed. Earthwork (e.g., regrading and reshaping) and revegetation activities would be limited by the time of year during which they can be effectively implemented. In general, earthwork and drainage control would be completed in the summer or early fall. Seedbed preparation would generally be completed in the fall, either concurrently with or immediately prior to seeding. Seeds would be sown in late fall to take advantage of winter and spring precipitation and optimum spring germination potential. Early spring seeding may be utilized for areas not seeded in the fall. In either case, seeding would not take place when the ground is frozen or snow covered. Table 2.1-3 outlines the anticipated reclamation schedule on a quarterly basis. Site conditions and/or yearly climatic variations may require that this schedule be modified to achieve maximum revegetation success. Reclamation activities would be coordinated with the BLM and BMRR as necessary. The reclamation of the Proposed Action is expected to take place within approximately one year from the time of commencement of final reclamation activities and would be initiated within two years following the completion of exploration activities. Revegetation success is anticipated to occur approximately three years from the time of seeding.

Existing roads such as the Barrett Springs and Abel Flats roads would be utilized for exploration activities as much as practicable, minimizing the need for new road construction. These existing roads would not be reclaimed and any improvements would remain. All exploration roads from Notice-level authorizations would be fully reclaimed. All NMC drill sites, sumps, and roads constructed under the Proposed Action would be fully reclaimed. Concurrent reclamation

activities during the exploration program would involve the management of drill sites to contain cuttings and manage drilling fluids, plugging drill holes, monitoring road conditions during periods of inclement weather, and keeping work sites clean and safe. Drill sites would also be patrolled with a hand rake and shovel after Project activities have been completed to scatter and cover any cuttings piles, fill ruts, and to perform general clean-up. All drill holes would be plugged as described in Section 2.1.2 above. Soils capable of serving as growth media would be salvaged and stockpiled as part of the fill slope of

Table 2.1-3: Anticipated Exploration Reclamation Schedule

TECHNIQUES	Quarter				
	1st Jan.-Mar.	2nd April-June	3rd July-Sept.	4th Oct.-Dec.	Year(s)
Earthwork					Within two years of Project completion
Seeding					Within two years of Project completion
Monitoring					Three or more years beyond regrading and reseeding

roads and drill pads. In addition, as much of the soil organic matter as possible would be salvaged to minimize compaction and promote aeration during reclamation. Soil amendments would not be considered necessary in those areas where sufficient growth media are available. During extended periods of non-operation or seasonal closure of exploration activities, all exploration equipment and supplies would be removed from the Project Area to the staging area located on private land.

The regrading and reshaping of all disturbed areas related to the Project would be completed to approximate the original surface topography. Fill material, enhanced with growth media, would be pulled onto the roadbeds to fill the road cuts and restore the slope to the preexisting natural contours. Regrading and reshaping activities would be completed with a Caterpillar 325 excavator or equivalent, or a Cat D8 bulldozer or equivalent. Drill pads and tire tracks from overland travel would be lightly scarified and left in a rough state as necessary to relieve compaction, inhibit soil loss from runoff, and prepare the seed bed for revegetation.

Should any drainages be disturbed under the Proposed Action they would be reshaped to recreate the pre-construction channel contours. The resulting channels would be of the same capacity as up and downstream reaches and would be made non-erosive by use of surface stabilization techniques, such as rip-rap (from a BLM-approved source), where necessary and ultimately revegetated.

Following the earthwork, all reclaimed areas would be broadcast seeded with a BLM approved seed mix (Table 2.1-4) at the appropriate time of year for optimum seed sprouting and plant growth. Only certified weed-free seed would be used for reclamation seeding. Broadcast seeding would be completed using a cyclone-type bucket spreader or mechanical blower at an application rate of approximately ten pounds of pure live seed per acre. Broadcast seed would be covered by harrowing, raking, or other appropriate site-specific methods as necessary to provide seed cover and enhance germination. Reclaimed surfaces would be left in a textured or rough condition (small humps, pits, etc.) to enhance moisture retention and revegetative success while

minimizing erosion potential. Changes and/or adjustments to the reclamation plant list and/or application rate would be made in consultation with, and approved by, the BLM and BMRR.

Post-reclamation maintenance would consist of remedial dirt work and reseeding if required. Site monitoring for stability and revegetation success would be conducted once a year, during the spring or fall, for approximately three years or until attainment of the revegetation standards established in the Nevada Guidelines for Successful Revegetation for the Nevada Division of Environmental Protection, the Bureau of Land Management, and the United States Department of Agriculture (USDA) Forest Service (Instruction Memorandum #NV 99-013).

Table 2.1-4: Proposed Revegetation Seed Mix

Common Name*	Scientific Name	Pounds/Acre (pure live seed)
Fourwing saltbush	*Atriplex canescens*	3.0
Shadscale	*Atriplex confertifolia*	3.0
Crested wheatgrass	*Agropyron cristatum*	2.5
Indian ricegrass	*Ahcnatherum hymenoides*	1.0
Forage kochia	*Kochia prostrata*	0.5
	Total	**10.0**

* Seed mixtures may change during concurrent and final reclamation. The changes would be based on targeting specific soil/disturbance types and experience gained during concurrent reclamation during the life of the Project, on test plot results, and changes in agency recommendations.

Additional reclamation activities include the abandonment and removal of monitoring wells and the removal of all equipment, supplies, and materials brought onto public land at the end of the Project life. Other materials, including scrap, trash, and unusable equipment, would be removed on a daily or weekly basis and disposed of in accordance with federal, state, and local regulations.

Post-closure management would commence on any reclaimed area following completion of the reclamation work for that area. Post-closure management would extend until the reclamation of the site or component has been accepted by both the BLM and BMRR. For sites reclaimed early in the operations of the Proposed Action, management of the reclaimed areas would occur concurrently with exploration operational site management. Yearly visits to the site would be conducted to monitor the success of the revegetation for approximately three years following seeding. Annual reports showing reclamation progress would be submitted to the BLM and BMRR.

2.1.11 Monitoring

Monitoring would include periodic visual inspections during road and drill site construction, drilling operations, and reclamation. Monitoring of constructed drill roads and water bars would also include visual inspections during periods of inclement weather. Monitoring of drill sumps would include periodic visual inspections during drilling operations to ensure that drill cuttings are contained. Should the observed condition indicate that the sumps containment is inadequate, additional sump capacity would be built and/or incorporated into the drilling fluid management system.

The proposed reclamation is expected to have a duration of up to three years from the time of commencement of final reclamation and would be initiated within two years after the completion of exploration activities. Revegetation is anticipated to occur approximately three years after the time of seeding to achieve success. Yearly visits to the Project Area would be conducted to monitor the success of revegetation.

2.1.12 Environmental Protection Measures

NMC has committed to the following environmental protection measures to prevent unnecessary and undue environmental degradation during construction, operation, and reclamation activities of the Proposed Action. The measures are derived from the general requirements established in BLM Surface Management Regulations at 43 CFR 3809, as well as water, air quality, and other environmental protection regulations.

Water Quality

- All but ten drill holes would be surveyed and plugged as an operational procedure immediately after completion of drilling in accordance with NAC 534.421 and 534.425. The ten drill holes would be collared with a RC drill rig and completed using a core rig. Once the core rig has completed the drill hole, the hole would be plugged. Drill holes would be plugged by placing drill cuttings or cement grout, concrete grout, or neat cement plug into the total depth of the hole, or if ground water is encountered, plugged as a well pursuant to NAC 534.420.

- Storm water BMPs would be used at construction sites to minimize storm water erosion.

- BMPs such as check dams (weed-free straw bales) would be used to slow and disseminate discharge water from pump tests to decrease erosion and sedimentation to surface waters.

- Drill cuttings would be contained on site and fluids managed utilizing appropriate control measures. Sediment traps would be used as necessary and filled at the end of the drill program.

- NMC would follow the Spill Prevention Plan included in the Plan.

- Only nontoxic fluids would be used in the drilling process.

Cultural and Paleontological Resources

- Pursuant to 43 CFR 10.4(g), NMC would notify the BLM authorized officer, by telephone, and with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR 10.2). Further, pursuant to 43 CFR 10.4 NMC would immediately stop all activities in the vicinity of the discovery and not commence again until a notice to proceed is issued by the BLM authorized officer.

- NMC would not knowingly disturb, alter, injure, or destroy any scientifically important paleontological deposits. In the event that previously undiscovered paleontological

resources are discovered by NMC in the performance of any surface disturbing activities, the item(s) or condition(s) would be left intact and immediately brought to the attention of the authorized officer of the BLM. If significant paleontological resources are found, avoidance, recordation, and/or data recovery would be required.

- As a rule all eligible or contributing elements of an eligible site would be avoided by a buffer zone of 100 feet. In cases of historic roads the non-contributing elements would continue to be utilized and the contributing elements would not be utilized for transportation. The contributing elements would continue to be avoided by the 100 feet buffer zone during all other activities. If eligible or the contributing elements to an eligible site could not be avoided the site would be mitigated through a data recovery plan approved by the BLM in consultation with the State Historic Preservation Office (SHPO).

- The BLM would provide a review of the work plan for each phase prior to NMC initiating activities under that phase to ensure the protection of all contributing elements of or eligible cultural resources. Any cultural resource discovered by NMC, or any person working on their behalf, during the course of activities on federal land would be immediately reported to the authorized officer by telephone, with written confirmation. The permit holder would suspend all operations in the immediate area of such discovery and protect it until an evaluation of the discovery can be made by the authorized officer. This evaluation will determine the significance of the discovery and what mitigation measures are necessary to allow activities to proceed. NMC would be responsible for the cost of evaluation and mitigation. Operations would resume only upon written authorization to proceed from the authorized officer.

- NMC would provide a fact sheet and field orientation to heavy equipment operators and drilling crews. The fact sheet would include information on fossils that could be found during surface disturbing activities in the Project area and the procedure to follow if fossils were found.

- NMC would have a geologist on site during surface disturbing activities in the following buffered areas where the Lake Lahontan highstand (elevation 4,360) is mapped in the Project Area: T37N, R36E sections or portions of sections 19, 20, 22, 27, 28, 29, 32, 33, T36N, R36E sections or portions of sections 26, 19, 20, 29, and 30, and a portion of T37N, R35E, section 15.

Migratory Birds

- Land clearing or other surface disturbance associated with the Proposed Action would be conducted outside of the avian breeding season, whenever feasible, to avoid potential destruction of active bird nests or young birds in the area. When surface disturbance must be created during the avian breeding season (April 15 through July 15), a qualified biologist would survey the area prior to land clearing activities. If active nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nest material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) would be delineated and the entire buffer area avoided to prevent destruction or disturbance to nests until they are no longer active. The

start and end dates of the seasonal restriction may be based on site-specific information, such as elevation and winter weather patterns, which affect breeding chronology.

Wildlife

- All construction activities within 600 feet of the openings of underground workings known to be habitat to sensitive bat species would be avoided during winter hibernation (between the months of October and March).

- If construction activities occur closer than 600 feet of the openings of underground workings, outside of the hibernation period (between the months of April and September), NMC would consult with the BLM and a qualified expert in the field of bat conservation and biology to develop appropriate mitigation.

- All trenches, sumps, and other small excavations that pose a hazard or nuisance to the public, wildlife, or livestock would be adequately fenced to preclude access or constructed with a sloped end for easy egress.

Public Safety and Access

- Public safety would be maintained throughout the life of the Project. All equipment and other facilities would be maintained in a safe and orderly manner.

- NMC would contact the appropriate agency prior to surface disturbance or drilling in any underground right-of-way (ROW).
- Drill sites, sumps, and trenches would be reclaimed as soon as practicable after completion of sampling and logging.

- Activities would be restricted to frozen or dry ground conditions where feasible. Operations would be curtailed when saturated or soft soil conditions exist.

- Any survey monuments, witness corners, or reference monuments would be protected and avoided.

- Pursuant to 43 CFR 8365.1-1(b)(3) and 43 CFR 3809.420(b)(5) and (6), no sewage, petroleum products, or refuse would be dumped from any trailer or vehicle.

- All regulated wastes would be removed from the Project Area and disposed of in a state, federal, or local designated area.

- All applicable state and federal fire laws and regulations would be complied with and all reasonable measures would be taken to prevent and suppress fires in the Project Area.

- Final reclamation of overland travel routes, sumps, and drill sites would consist of, if required, fully recontouring disturbances to their original grade, and reseeding in the fall season immediately following completion of exploration activities.

- In the event that any existing roads are severely damaged as a result of NMC activities, NMC would return the roads to their original condition.

Vegetation

- Reseeding would be consistent with all BLM recommendations for seed mix constituents, application rate, and seeding methods.

Air Quality

- Emissions of fugitive dust from disturbed surfaces would be minimized by the application of water from a water truck as a method of dust control.

- Vehicle speed limits would be limited to 25 miles per hour (mph) in areas that have a silty or powdery surface.

Noxious Weeds

- Noxious weeds would be controlled through implementation of preventative BMPs and eradication measures if noxious weeds were found.

2.2 No Action Alternative

Under the No Action Alternative, the BLM would not approve the Plan and would not authorize the Proposed Action. The area would remain available for other multiple use activities, as approved by the BLM. In addition, work could continue on seven of the nine Notices in the form of occupying already disturbed sites or creating new disturbance for a total of 35 acres on public land. These Notices could be extended in two year increments. Disturbance associated with the two PFRs, which incorporate public and private land total 34.22 acres. In addition, five acres of disturbance could occur on private land in ten additional sections (50 acres) because they are located a mile from existing permitted activities. The amount of disturbance that could occur under the No Action Alternative is 119.2 acres. Reclamation of Notice-level activities includes plugging drill holes, backfilling sumps, recontouring, and reseeding.

Alternatives Considered but Eliminated from Detailed Study

2.3.1 Cross Country/Overland Travel Alternative

This alternative would utilize only overland or cross country travel and would not allow for construction of new roads. Utilization of cross country exclusively for the Project would eliminate portions of the exploration area due to the presence of outcrops, which would not permit the overland passage of Project-related equipment. This alternative does not meet the purpose and need of the Proposed Action, which is to fully evaluate the mineral potential in the Project Area as allowed under the Mining Law because exploration of the mineralization in this area is difficult and requires numerous drill holes in order to evaluate the geologic and mineral potential.

2.3.2 Use Only Existing Roads Alternative

Under this alternative, all exploration activities would use only existing roads and no new roads would be constructed. This alternative does not meet the purpose and need of the Proposed Action because exploration of the lithologically controlled deposits in this area is difficult and

requires numerous drill holes and trenches in order to evaluate the geologic and mineral potential. An alternative that eliminates access to portions of the exploration area would deny the claimant the opportunity to fully evaluate and characterize the mineral potential. However, the Proposed Action incorporates the use of existing roads to maximum extent possible.

2.3.3 Helicopter Drilling Alternative

This alternative would involve conducting exploration by using a helicopter to access the entire Project Area rather than construct roads. This would involve slinging or transporting a drill rig, fuel, supplies, laborers for pad construction, and drilling personnel via helicopter to all of the proposed drill sites. Water for drilling purposes would either need to be pumped to the site via water lines using diesel generators and pumps or by slinging water to the drill site. All personnel would be ferried to the drill site from staging areas via helicopter or they would have to hike to the drill sites from the existing roads. All drill samples would have to removed from the drill sites with the use of a helicopter. New surface disturbance would still result from this alternative from construction of all the drill sites, the exploration drilling that occurred on existing roads, and from the development of staging areas.

The Helicopter Drilling Alternative for the entire Project Area was considered but eliminated from full analysis for several reasons. First, helicopter drilling for the entire Project Area would not meet the purpose and need of the Proposed Action because at the present time, helicopters typically support core rigs. Most of the activities under the Proposed Action would need to be conducted by high-production reverse circulation drill rigs, which are not helicopter supported. In addition, helicopter drilling would take substantially longer to obtain the same geologic data and could also require more drill holes, resulting in more disturbance and potential impacts to natural resources. Many of the proposed drill sites have existing road access and are not located in sensitive habitats or on steep terrain that can only be accessed by helicopter. Additionally, the Project Area is located immediately adjacent to the Jungo Road and other existing access roads, which provide well developed access to the area and a number of roads within the Project Area have already been constructed under Notice-level and private land activities. Therefore, helicopter drilling for all the drill sites throughout the Project Area would not provide any environmental benefit over the Proposed Action.

3 AFFECTED ENVIRONMENT

3.1 Introduction

Public lands administrated by the BLM comprise approximately half of the land in a checkerboard pattern within the Project Area. The remainder of the Project Area consists of private land. Public lands under BLM jurisdiction are managed for the multiple uses of range, forestry, watershed, mineral extraction, recreation, wilderness, and wildlife habitat. One of the objectives in the BLM's Paradise Denio MFP is to make public lands and federally-owned minerals available for exploration and development (BLM 1982).

The Project Area is crosscut by a number of pre-existing roads as shown on Figure 1.1.2. The Jungo Road is located in two sections of the southeastern corner of the Project Area. The area is currently used for livestock grazing, wildlife habitat, and mineral exploration. Recreational uses of the public land in the vicinity of the Project Area consist of dispersed activities such as hunting, biking, primitive camping, rock hounding, and off-road vehicle travel. The private land is currently used for mineral exploration, grazing, and surface occupancy. Eight wildland fires have occurred in the Project Area between 1985 and 2006. The footprint of these wildland fires measures approximately 6,686 acres or 24.2 percent of the 27,588-acre Project Area lands, which were burned by these wildfires (Figure 5.1.1).

The mean annual precipitation at the Winnemucca Airport, located approximately 5.25 miles southeast of the Project, is 8.3 inches, and the mean annual snowfall is 16.5 inches. Most precipitation in central Nevada is from frontal storms mainly from the north and west during the winter months and convectional storms during the summer months. Frontal storms are generally low intensity, short duration events covering large areas. Convective storms are generally high-intensity thunderstorms, and are brief and have limited aerial extent.

Ground water within the Project Area consists of flow through fractured bedrock and alluvial deposits. This type of flow is unpredictable and can often be found as perched water. Surface water within the Project Area is dependent on seasonal precipitation. Due to the low permeability of some of the surficial geologic units, pooling of surface water can occur. As a result aquatic communities (insects) may appear in the ephemeral drainages, depending on the quality and availability of the water. Hydrological information available from the mineral and ground water exploration drilling performed to date suggests that the water table in the Project Area is relatively shallow. Based on previous drilling in the area, the depth to ground water is at approximately 100 feet below the ground surface. None of the shallow drill holes (e.g., holes less than 100 feet deep) encountered ground water.

The Desert Valley (Basin #31), Silver State Valley (Basin #32), and Winnemucca Segment (Basin #70) Hydrographic Basins are designated ground water basins. Designated ground water basins are basins where permitted ground water rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration. The Desert Valley and Winnemucca Segment Hydrographic Basins are designated for the entire basin and the Silver State Valley Hydrographic Basin is designated for only a portion of the basin. For the Desert Valley Hydrographic Basin, the annual yield is estimated to be 9,000 acre-feet per year (acft/yr), for the Silver State Valley Hydrographic Basin the annual yield is estimated to be 5,900 acft/yr, and for the Winnemucca Segment Hydrographic Basin the annual

yield is estimated to be 17,000 acft/yr, while the permitted withdrawal exceeds the annual yield for all three basins. Under such conditions, a state's water officials would so designate a ground water basin and, in the interest of public welfare, declare preferred uses (e.g., municipal and industrial, domestic, agriculture, etc.). For Nevada, the Nevada State Engineer, Division of Water Resources (NDWR), is authorized by NRS 534.120 and directed to designate a ground water basin and declare preferred uses within such designated basin.

Current uses for Desert Valley Hydrographic Basin are limited to commercial, construction, industrial, irrigation, mining and milling, recreation, and stock water applications for environmental permits filed pursuant to NRS 533.437. Current uses for Silver State Valley Hydrographic Basin are limited to irrigation, mining and milling, quasi-municipal, and stock water applications for environmental permits filed pursuant to NRS 533.437. Current uses for Winnemucca Segment Hydrographic Basin are commercial, construction, domestic, environmental, industrial, irrigation, mining and milling, municipal, quasi-municipal, recreation, stock water, wildlife, and other manners of use. The State Engineer has additional authority in the administration of the water resources within a designated ground water basin (NDWR 2008).

Existing water uses in and near the Project Area include the two existing water wells, one is located in the northern portion of the Project Area (MM-148), and the other is located near the southern edge of the Project Area. Both water well sites include small stock watering ponds. The southern water well is registered with the Nevada State Engineer under water permit number 76366 and NMC has a water right waiver with the Nevada State Engineer under MM-151. The northern water well was completed by NMC and NMC has a water right waiver with the Nevada State Engineer under MM-148.

The geology of the Sandman area includes basement rocks consisting of phyllite and quartzite of the Triassic Raspberry Formation and an overlying package of mid-Tertiary aged volcaniclastic sediments, rhyolitic air fall and ash flow tuffs, conglomerates, and basalt flows. The volcanic rocks are Miocene based on two age dates of 22.4 million years (Ma) and 22.6 from outcrops of basalt northeast and west of the Southeast Pediment deposit.

The various areas of mineralization are associated with the intersection of north-south and northeast structural trends. There are also northwest and east-west secondary structures. Most faults appear to be extensional with a minor strike slip component. Growth faults, probably related to the development of the north-south graben, have an important influence on the volcanic rocks and also control mineralization.

The alteration and mineralization at Sandman are characteristic of a low sulfidation epithermal system with structurally controlled quartz-adularia flooding and subtle, discrete quartz veinlets. Unger (2008) dated some of the adularia west of Silica Ridge as mid-Miocene (16.2 Ma). Highly fractured, structural breccias are common in the deposits and suggest that faulting was pre- and post-mineralization and are a major control on the mineralization and the quartz-adularia alteration. Mineralization may be stratigraphically controlled in some areas of the deposits. There are also large zones of strong argillic alteration that surround the mineralization.

Table 3.1-1 identifies the supplemental authorities (formerly critical elements of the human environment) and whether each is not present, present and not affected and present and potentially affected. Table 3.1-2 identifies additional affected resources that are present and potentially affected.

Table 3.1-1: Supplemental Authorities (Critical Elements of the Human Environment)

Element	Not Present	Present, Not Affected	Present, Potentially Affected	Reference Section
Air Quality			X	See Section 3.2.
Areas of Critical Environmental Concern (ACECs)	X			Element is not present.
Cultural Resources			X	See Section 3.3.
Environmental Justice	X			There are no environmental justice issues associated with the Project.
Flood Plains	X			Element is not present.
Invasive and Nonnative Species			X	See Section 3.4.
Migratory Birds			X	See Section 3.5.
Native American Religious Concerns			X	See Section 3.6.
Prime or Unique Farmlands	X			Element is not present.
Threatened or Endangered Species	X			Element is not present.
Wastes, Hazardous or Solid	X			Element is not present.
Water Quality (Surface and Ground)			X	See Section 3.8 for surface water. Ground water issues are *de minimus* for the Project.
Wetlands and Riparian Zones	X			Element is not present.
Wild and Scenic Rivers	X			Element is not present.
Wilderness	X			Element is not present.

Table 3.1-2: Additional Affected Resources

Other Resources	Present, Potentially Affected	Reference Section
Land Use	X	See Section 3.9
Noise	X	See Section 3.7
Public Safety	X	See Section 3.11
Paleontology	X	See Section 3.10
Rangeland Management	X	See Section 3.12
Social and Economic Values	X	See Section 3.13
Soils	X	See Section 3.14
Special Status Species	X	See Section 3.15
Vegetation	X	See Section 3.16
Visual Resources	X	See Section 3.17
Wildlife	X	See Section 3.18

3.2 Air Quality

The southern end of the Project covers the gentle southwest-facing slopes of Abel Flat between Blue Mountain and the Krum Hills. The Project extends north over hills and sand dunes between the Desert and Silver State Valleys south of the Slumbering Hills. The climate is arid, and characterized by warm, dry summers and moderately cold, dry winters. The mean annual

precipitation at the Winnemucca Airport, located approximately 5.25 miles southeast of the Project, is 8.3 inches, and the mean annual snowfall is 16.5 inches. The mean annual low temperature is 33 degrees Fahrenheit (°F) and the mean annual high temperature is 64.8°F (WRCC 2008).

The Bureau of Air Pollution Control (BAPC) is the agency in the State of Nevada that has been delegated the responsibility for implementing a State Implementation Plan (SIP) for air quality (excluding Washoe and Clark Counties, which have their own SIPs). Included in a SIP are the State of Nevada air quality permit programs (NAC 445B.001 through 445B.3485, inclusive). Also as part of a SIP are the Nevada State Ambient Air Quality Standards (NSAAQS). The NSAAQS are generally identical to the National Ambient Air Quality Standards (NAAQS), with the exception of the following: (a) an additional standard for carbon monoxide in areas with an elevation in excess of 5,000 feet amsl; (b) the recently implemented NSAAQS for particulate matter of aerodynamic diameter less than 2.5 microns ($PM_{2.5}$); c) the revised NAAQS for particulate matter of aerodynamic diameter less than ten microns (PM_{10}); (d) ozone (Nevada has yet to adopt the new and revised federal standards); and (e) a violation of a state standard occurs with the first annual exceedance of an ambient standard, while federal standards are generally not violated until the second annual exceedance. In addition to establishing the NSAAQS, the BAPC is responsible for the Prevention of Significant Deterioration (PSD) program; enforcing the New Source Performance Standards; and implementing the Federal Operating Permit Program (Title V) throughout the State of Nevada.

Attainment status within the Project Area is determined by monitoring ambient levels of criteria pollutants. The attainment or unclassified designation means that no violations of Nevada or national air quality standards have been documented in the region. The Project Area is located within the Desert Valley Air Basin (31), Silver State Valley Air Basin (32), and Winnemucca Segment Air Basin (70). All of these basins are considered in attainment relative to the NAAQS and are not PSD triggered basins for any pollutants. The existing air quality is typical of largely undeveloped regions of the western United States with limited sources of pollutants.

3.3 Cultural Resources

The Project Area is located north of Jungo Road between Blue Mountain and the Krum Hills in the Northern Great Basin. The Project Area is a large dynamic area with a rich prehistoric and historic cultural history and has been occupied for up to the last 12,000 years (Cressman 1986: 120; Elston 1986: 135). Occupation of the Project Area has varied over time, driven by changes of the environment from the period of Lake Lahontan to the dry climate of modern time, the historic rush to the west, the boom and bust of mining, and the resilience and persistence of settlers.

The cultural use of the area would have varied over time. During the early periods of the cultural use of the area the shore lines of Lake Lahontan were within the Project Area. Cultural use of the project area would have been primarily for hunting and plant gathering with the potential for temporary or longer term campsites. During the Archaic and Late Prehistoric periods these areas would have continued to be utilized for hunting and plant gathering. In the historic period the Project Area would have been primarily utilized by miners and associated industries, ranchers, and settlers.

Fourteen cultural resource inventories have been undertaken in the Project Area and have inventoried all 27,588 acres of the Project Area. These projects consist primarily of mining exploration activities, well or range improvements, and wildfire reconnaissance. No cultural resources were identified during six of the 14 inventories (CR2-429(N), CR2-659(N), CR2-693(N), CR2-1019(N), CR2-2112(N), and CR2-2743(N)). One hundred and ninety three cultural resources were identified in the Project Area during the remaining nine inventories (CR2-879(P), CR2-1090(P), CR2-1363(P), CR2-1374(P), CR2-1417(P), CR2-1477(P), CR2-2041(P), & CR2-3019(P)). Of the 193 archaeological sites within the project area, 12 of these sites (CrNV-21-4582, CrNV-02-8745, CrNV-02-8746, CrNV-02-8747, CrNV-02-8749, CrNV-02-8751, CrNV-02-8813, CrNV-02-8820, CrNV-02-8844, CrNV-02-8873, CrNV-02-8879, & CrNV-02-8903) were determined to be eligible for listing on the National Register of Historic Places (NRHP).

3.4 Invasive, Nonnative Species

An "invasive species" is defined as a species that is nonnative to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112). Invasive, nonnative species are species that are highly competitive, highly aggressive, and spread easily. They include plants designated as "noxious" and animals designated as "pests" by federal or state law.

The Nevada Department of Agriculture maintains a Nevada Noxious Weed List. The BLM defines "noxious weed" as "a plant that interferes with management objectives for a given area of land at a given point in time." The strategy for noxious weed management is to "prevent and control the spread of noxious weeds through local and regional cooperative efforts… to ensure maintenance and restoration of healthy ecosystems on BLM-managed lands." Noxious weed control would be based on a program of "....prevention, education, detection, and quick control of small infestations." Animal and plant species designated as "pests" are generally species that are injurious to agricultural and nursery interests or vectors of diseases, which may be transmissible and injurious to humans.

The BLM identifies six species of noxious weeds potentially occurring within the Project Area and immediate vicinity: hoary cress (*Cardaria draba*); perennial pepperweed (*Lepidium latifolium*); salt cedar (*Tamarix* sp.); medusahead (*Taeniatherum caput-medusae*); bull thistle (*Cirsium vulgare*); and Scotch thistle (*Onopordum acanthium*) (BLM 2008). Noxious weed species were not detected in the Project Area during surveys. Weedy, invasive species generally occupy areas of previous disturbance and barren areas and include cheatgrass (*Bromus tectorum*). Eight wildland fires have occurred within the Project Area (Figure 5.1.1). Many of the burned areas are composed of cheatgrass monocultures within the old fire perimeters (BLM 2008).

3.5 Migratory Birds

"Migratory bird" means any bird listed in 50 CFR 10.13. All native birds commonly found in the United States, with the exception of native resident game birds, are protected under the Migratory Bird Treaty Act (MBTA). The MBTA prohibits taking of migratory birds, their parts, nests, eggs, and nestlings without a permit. Executive Order 13186, signed January 10, 2001, directs federal agencies to protect migratory birds by integrating bird conservation principles, measures, and practices.

Additional direction comes from the Memorandum of Understanding (MOU) between the BLM and the United States Fish and Wildlife Service (USFWS), signed January 17, 2001. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the BLM and USFWS, in coordination with state, tribal, and local governments. The MOU identifies management practices that impact populations of high priority migratory bird species, including nesting, migration, or over-wintering habitats, on public lands, and develops management objectives or recommendations that avoid or minimize these impacts.

There are two types of habitat within the Project Area; sagebrush and salt desert scrub. According to the Great Basin Bird Observatory (GBBO) survey protocol, migratory bird species associated with areas characterized by sagebrush vegetative communities may include the following: black-throated sparrow (*Amphispiza bilineata*); horned lark (Eremophila alpestris); western meadowlark (*Sturnella neglecta*); Brewer's blackbird (*Euphagus cyanocephalus*); canyon wren (*Catherpes mexicanus*); gray flycatcher (*Empidonax wrightii*); green-tailed towhee (*Pipilo chlorurus*); rock wren (*Salpinctes obsoletus*); sage thrasher (*Oreoscoptes montanus*); and vesper sparrow (*Pooecetes gramineus*) (GBBO 2003). Vesper sparrow is a BLM sensitive species and is discussed in Section 3.12. Migratory bird species associated with areas characterized by salt desert scrub may include the following: sage thrasher; western burrowing owl (*Athene cunicularia*); loggerhead shrike (*Lanius ludovicianus*); horned lark; black-throated sparrow; and rock wren. Loggerhead shrike and western burrowing owl are BLM sensitive species and are discussed in Section 3.12.

Additional migratory bird species observed either directly or indirectly in the Project Area during a survey conducted by Enviroscientists in 2008 included the following species: chukar (*Alectoris chukar*); common raven (*Corvus corax*); great horned owl (*Bubo virginianus*); house finch (*Carpodacus mexicanus*); northern flicker (*Colaptes auratus*); red-tailed hawk (*Buteo jamaicensis*); ruby-crowned kinglet (*Regulus calendula*); common nighthawk (*Chordeiles minor*); gray flycatcher (*Empidonax wrightii*); and magpie (*Pica pica*).

Brewer’s sparrow (*Spizella breweri*), a migratory bird and species protected under NRS Chapter 501, is found in sagebrush, desert scrub, lower montane chaparral, and Mojave mid-elevation mixed desert scrub. They prefer areas dominated by high shrub cover with few grasses in the understory. Brewer’s sparrows breed in mid-April in the south or May to early June in the north. This species forages on the ground and consumes insects in the summer and seeds in the fall and winter. Brewer’s sparrow is distributed throughout Nevada. Brewer’s sparrows were identified in the Project Area during the May 1999 and October 2008 surveys.

Sage sparrow (*Amphispiza belli)*, a migratory bird and species protected under NRS Chapter 501, is found mainly in sagebrush and can also inhabit saltbush, shadscale, antelope bitterbrush (*Purshia tridentata*), rabbitbrush (*Chrysothamnus* sp.), mesquite (*Prosopis* sp.), and chaparral. They prefer semi-open habitats with shrubs above average in height, horizontal clearance, and few grasses in the understory. Sage sparrows avoid building nests on the southwestern side of shrubs. This species feed on insects, spiders, and seeds, and forage on the ground. Sage sparrows occur throughout Nevada, north of the Mohave Desert. Sage sparrows were observed in the Project Area during the May 1999 and October 2008 surveys.

3.6 Native American Religious Concerns

The Sandman Project Area is located in the traditional area of the Northern Paiute Sawawaktödö tuviwarai Band (also known as the Sawakudökwa tuviwarai or the Sagebrush Mountain Dwellers). Traditionally the area of the Proposed Action would have been utilized primarily for hunting and gathering with the potential for periods of longer term occupations (Stewart 1939).

On October 5, 2009, letters providing information relating to the Proposed Action were sent to the Winnemucca Indian Colony and the Summit Lake Paiute Tribe and on October 16th, 2009, letters providing information relating to the Proposed Action were sent to the Fort McDermitt Paiute & Shoshone Tribe and the Lovelock Paiute Tribe. Additionally, follow-up phone calls were conducted to identify if the Tribes had any concerns about the Proposed Action, effects it may have on a traditional cultural place (TCP) or sacred sites, or if the Tribe would like to have formal government to government consultation relating to the proposed action.

On October 15, 2009, an e-mail was received from Ron Johnny, of the Summit Lake Paiute Tribe, expressing that the Tribal Council was concerned with the Project relating to whether artifacts had been collected during the cultural resource inventories, protection of resources, pollution, and if tribal monitors would be utilized during the proposed activities. On November 12, 2009, Mr. Ron Johnny and Ms. Rachael Brown of the Summit Lake Paiute Tribe and Mr. Samuel Potter of the BLM visited the Project Area for a tour and to answer questions about the proposed Project. During the tour of the Project Area it was conveyed to Mr. Johnny and Mrs. Brown that no artifacts were collected during the cultural resource inventories and that the protection of other resources and pollution would be analyzed in the EA. It was also expressed to Mr. Johnny and Mrs. Brown that the BLM could not require NMC to hire tribal monitors. Mr. Johnny re-expressed the Tribal Council's concerns and stated after the tour that he would report to the Council about the tour and that they would then decide if they would like a presentation, additional tours, or further government to government consultation. On December 31, 2009, a follow up call to the site tour was conducted and Mr. Johnny indicated that no further consultation would be required at this time.

To date, no TCPs or Executive Order 13007 sites have been identified within the Project Area that might be impacted by the Proposed Action or alternatives. Consultation is ongoing.

3.7 Noise

The Project Area is located in a remote portion of northern Nevada and has no urban or suburban development. Noise sensitive land uses in the vicinity consist of large ranches and employee housing in the valleys that support agriculture. An environmental noise analysis was completed for the Sandman Project in June 2009 by Brown-Buntin Associates, Inc. (BBA). The noise analysis was prepared to assess the background conditions, and thepotential noise impacts of the exploration Project. The nearest residences to the Project Area are ranches located approximately eight miles northeast of the T37N, R36E, section 19 site and approximately seven miles southeast of the section 22 site.

The three sites are shown on Figure 1.1.2 in T37N, R36E, section 19, T36N, R36E sections 20 and 22, were monitored. The section 19 site was approximately 100 feet from an unpaved road approximately 1,500 feet from a wind-powered water pump and spring. There were no apparent noise sources other than wildlife and wind, except that, apparently, a passerby made a loud noise

near the microphone at 11:44 a.m. This was likely an intentional act by the person or persons who activated a gasoline engine water pump by the spring. The section 20 site was approximately 1.5 miles from Jungo Road, 300 feet from the unpaved access road. There were no apparent noise sources other than wildlife and wind. Jungo Road is adjacent to the section 22 site (former Ten Mile site approximately 1,000 feet from the Jungo Road), but is otherwise south of the analysis areas by approximately two to seven miles. There were no apparent noise sources other than traffic on Jungo Road, wildlife, and wind.

In general, the ambient noise levels were found to be relatively low, averaging approximately 30 decibels (dB) during nighttime hours. Federal recommendations for acceptable noise levels at residential receivers are generally in the range of 55 dB Day-Night Level (L_{dn})to 65 dB L_{dn}.

Traffic Noise

The major roadway nearest the program area is Jungo Road, which, though unpaved, is well graded and is used by light and heavy trucks providing personnel, equipment, and supplies to various mines and ranches in the region. Jungo Road also connects to the Gerlach area via the Jungo and Sulphur sidings. The noise measurement data collected at section 22 indicate that the L_{dn} resulting from typical traffic on Jungo Road is in the range of 55 dB at a distance of 1,000 feet from the roadway. Traffic data provided by the Humboldt County Road Department indicated that the annual Average Daily Traffic (ADT) volume for existing conditions on Jungo Road at Barrett Springs Road is about 429 vehicles. In addition, there are an additional 571 vehicle trips associated with the Hycroft Mine located near Sulphur. It is assumed that approximately 40 percent is truck traffic. Day/night distribution of traffic noise was assumed to be 77 percent/23 percent for existing conditions. Vehicle speeds were assumed to be at existing limits.

The predicted L_{dn} value for existing traffic at a distance of 50 feet from the centerline of Jungo Road is 63.4 dB. The traffic noise level is predicted to be less than 55 dB L_{dn} at distances exceeding about 180 feet from the roadway centerline.

3.8 Water Quality

The Project is located within the Desert Valley, Silver State Valley, and Winnemucca Segment hydrographic basins.

Surface Water

The Project Area is situated on relatively shallow topography at the confluence of three hydrographic basins; Desert Valley, Silver State Valley, and the Winnemucca Segment. With the exception of a pit lake in a clay mine to the east of the Project Area, surface water is only present in minor drainages during storm events and seasonal snow melt. These ephemeral streams drain from ranges onto the valley floor, infiltrating into alluvial deposits within basins or evaporating and supporting only seasonal aquatic species, such as insects. During the field survey of the Project Area conducted in October 2008, the only surface water near the Project Area consisted of a pit lake from a clay mine operation near Barrett Springs approximately 0.33 mile southeast of the Project Area boundary in T37N, R36E, section 34. The well at Barrett Springs located in T37N, R36E, section 23 and located outside of the Project Area boundary also has open water sources that supply water for livestock.

3.9 Land Use Authorizations and Access

The Project Area is located within the checkerboard lands of northern Nevada where the alternate sections are NSPL administered by the BLM and private land (Figure 1.1.2). The private lands in the recent past were owned by Santa Fe Pacific and then NMC. NMC then transferred the surface ownership of the private lands to Nevada Land and Resource Company (NLRC) and NMC retained the ownership of the subsurface minerals and the right to use the surface for the exploration and development of the minerals. Relatively recently, NLRC has been selling some of the private land within the Project Area to individuals. In a few instances these individuals have established temporary residences on their property. Currently no individuals live within the Project Area. The NSPL within the Project Area are open public domain lands that have a multiple use designation by the BLM. The lands in the Project Area are zoned by Humboldt County as M-3, Open Space Land Use District. There are three land uses within the Project Area, these uses are shown on Figure 3.9.1. Agriculture and livestock operations are the principal permitted use within this zone. The current land uses are livestock grazing, mineral exploration, dispersed recreation, and wildlife habitat. In addition, the Project Area is utilized for several other uses, based on the BLM Master Title (MT) Plats, which have specific authorizations when located on public land. These uses include several roads, a powerline, a communications site, a gas pipeline, a windmill and associated pipeline for livestock watering, and a free use mineral material site.

The Project Area is crosscut by numerous pre-1981 roads, as well as mining disturbance in the southeastern and eastern portion of the Project Area. A reclaimed precious metal mining and heap leach operation is located in T36N, R36E, section 9. Two aggregate pits are located on private land. One is an extension onto private land (T33N, R36E, section 29) of the BLM mineral material site (T33N, R36E, section 30), and the other is located in T37N, R36E, section 33. In addition to the livestock watering facility noted above, a second water facility is located in T37N, R36E, section 19.

3.10 Paleontological Resources

A detailed study was conducted by Enviroscientists (2010a) using Information Memorandum (IM) No. 2008-009 and IM No. 2009-011. Together, these two IMs, with the Potential Fossil Yield Classification (PFYC) system, provide guidance for the assessment of potential impacts to paleontological resources, field survey and monitoring procedures, and recommended mitigation measures that protect paleontological resources impacted by federal actions. The Project Area contains a number of formations that range from very low (PFYC 1) to high (PFYC 4a) for the potential for significant paleontological resources.

The following is a description of the two Classifications in the Project Area and a description of local site-specific geology:

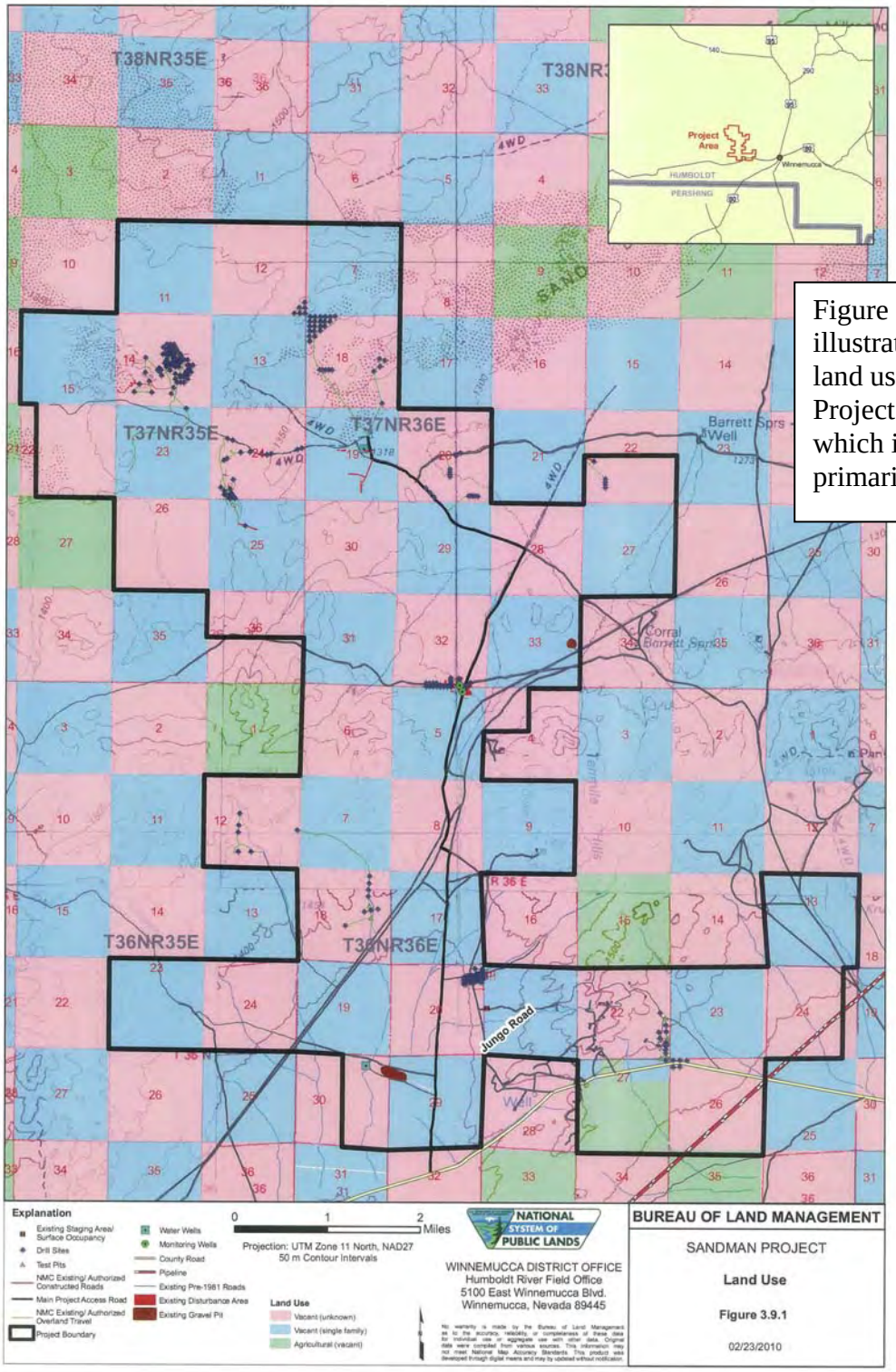


Figure 3.9.1 illustrates the land use in the Project Area, which is primarily vacant.

- Class 1 - Very Low. Geologic units that are not likely to contain recognizable fossil remains include units that are igneous or metamorphic (excluding reworked volcanic ash units) and units that are Precambrian in age or older. The geology of the Sandman area includes basement rocks consisting of phyllite and quartzite of the Triassic Raspberry Formation and an overlying package of mid-Tertiary aged volcaniclastic sediments, rhyolitic air fall and ash flow tuffs, conglomerates, and basalt flows. The volcanic rocks are Miocene based on two age dates of 22.4 million years ago (Ma) and 22.6 Ma from outcrops of basalt northeast and west of the Southeast Pediment deposit. NMC has conducted drilling programs along the northwest trend of target areas within the Project boundary. The depth of alluvium varies from zero to 90 feet. Below the alluvium is up to 800 feet of tuff, tuff conglomerate, or fluvial conglomerates prior to intersecting the basement phyllite. These geologic units comprise 84 percent of the Project Area.

- Class 4 - High. Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases.

  - *Class 4a* - Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions.

    The area on Figure 3.10.1 that shows the Lake Lahontan highstand contour would have a potential of Class 4a (approximately 16 percent of the Project Area). The uphill side of the contour has been buffered by 100 feet due to the range of published elevations between 4,360 feet and 4,400 feet. Fossils associated with Lake Lahontan, based on current fossil finds in Nevada in pluvial environments, are found in sinkholes that are below beach level or in near beach tributaries flowing into the lake. The areas of high potential should include the following areas where the Lake Lahontan highstand (approximate elevation of 4,360) is mapped in the Project Area: T37N, R36E sections or portions of sections 19, 20, 22, 27, 28, 29, 32, 33, T36N, R36E sections or portions of sections 26, 19, 20, 29, and 30, and a portion of T37N, R35E, section 15, (Figure 3.10.1).

There are no known paleontological sites in or near the Project Area.

3.11 Public Safety

Public Safety in the Project Area is related to travel on the Jungo Road and the recreational use of the area. Vehicle travel on the Jungo Road is approximately 1,382 trips per day. The speed limit on Jungo Road is 45 miles per hour. In the vicinity of the Project Area the road surface is either gravel or treated dirt, curves are generally not banked, and the road is not designed for high speed travel. Several public safety conditions such as historic mine workings, rock ledges, and sand dunes are present within the Project Area that may present hazards to recreationists.

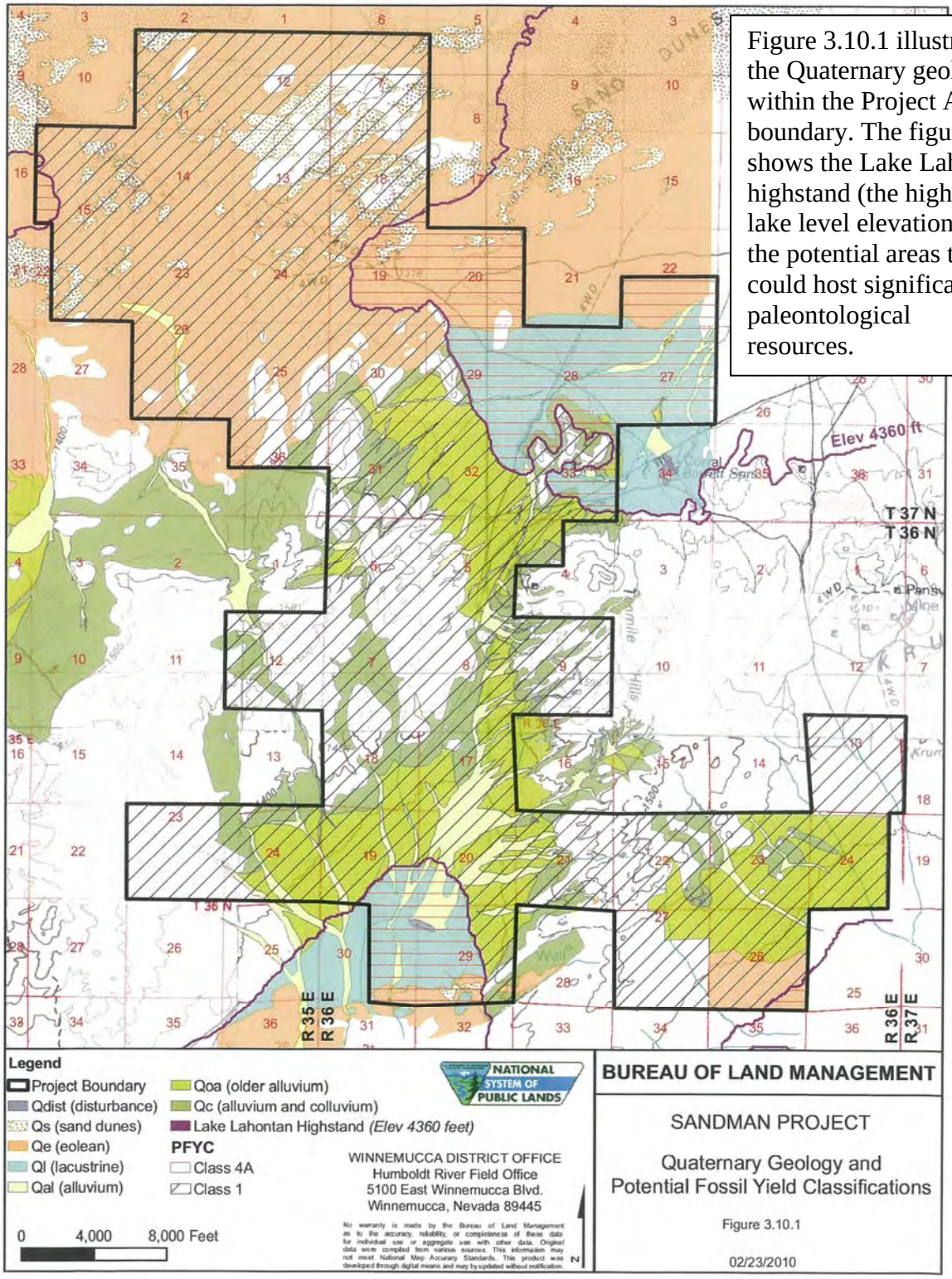


Figure 3.10.1 illustrates the Quaternary geology within the Project Area boundary. The figure also shows the Lake Lahontan highstand (the highest lake level elevation) and the potential areas that could host significant paleontological resources.

3.12 Rangeland Management

The Project Area is located within the Sand Dunes grazing allotment within the Winnemucca administrative unit. The following rangeland management information has been collected from the BLM. The Sand Dunes grazing allotment occurs on both public and private land resulting in a checkerboard land pattern. Numerous private sections have been fenced, restricting access and movement of people, livestock, and wildlife (BLM 2008).

The Sand Dunes grazing allotment encompasses approximately 167,449 acres of rangeland located on public and private land. There are three permittees authorized to graze cattle year-round excluding the month of September. Rangeland improvements within the Sand Dunes grazing allotment include an approximate two-week extension of use in an area where a cheatgrass reduction project is located, and a two-week reduction of use in the area to which livestock would then move. These areas would receive a rest from grazing during the critical vegetation growth period every other year, except for the location of the cheatgrass reduction. The cheatgrass reduction area would receive rest during the critical growth period every third year (BLM 2008).

Rangeland improvements within the Project Area include one corral and one windmill in T37N, R36E, section 19.

3.13 Social Values and Economics

The Project Area is located in Humboldt County, Nevada, approximately 7.5 miles west of Winnemucca, Nevada, on SR49. A temporary workforce of 50 employees or contractors would be hired by NMC and it is likely that the majority of workers would live outside of the Winnemucca area. These temporary workers would utilize lodging and services in Winnemucca and commute from there to and from the Project Area; therefore, the socioeconomic impacts associated with the Project include, and are likely limited to, Humboldt County.

Humboldt County

Humboldt County is located in north central Nevada and encompasses 9,704 square miles. The county lies along the Humboldt River and is bordered by Oregon to the north and Pershing, Elko, Lander, and Washoe Counties to the south, east, southeast, and west, respectively. I-80 and the transcontinental railroad traverse Humboldt County from the east and west.

The total population of Humboldt County in 2006 was estimated to be 17,751, which was an increase of 36 percent since 1990 (population 13,020) (State of Nevada 2008a). The population density as of 2006 was relatively low at 1.8 persons per square mile. The population in Winnemucca, the largest city and county seat, in 2006 was estimated to be 7,643 (State of Nevada 2008a). Winnemucca is home to numerous restaurants and retail outlets and provides a variety of lodging and recreational opportunities.

The economy of Humboldt County is based on major industries including mining, agriculture and agricultural services, tourism, and construction. Humboldt County is home to gold and other types of mining and is the leading agricultural county in the State of Nevada with over 100,000 acres under cultivation. Tourism is also a large part of the county's economy due to gaming and outdoor recreation (i.e., hunting and fishing).

The median household income in Humboldt County in 2006 was $59,600 annually (Nevada Workforce Informer 2010). Major employment sectors are mining, agriculture, educational, and health and social services (U.S. Census Bureau 2008a). The unemployment rate in Humboldt County was 8.6 percent in June 2009, which was 3.5 percent lower than the statewide unemployment rate at 12.1 percent (State of Nevada 2009b).

3.14 Soils

The information regarding the soils in the Project Area was primarily obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS). The soils within the Project Area consist of mountains and hills with residuum and colluvium derived from mixed rocks, plateaus with residuum derived from volcanic rocks, sand sheets consisting of mixed alluvium, dunes consisting of aeolian sand, and alluvium formed in erosional deposits on the fan piedmont slope and inset fans between mountains, hills, and plateaus (NRCS 2008). The soil mapping units are listed in Table 3.14-1 and shown on Figure 3.14.1.

Table 3.14-1: Summary of Soil Mapping Units and Characteristics

Mapping Unit	Soil Series	Acres in the Project Area	Soil Depth in Inches (Restrictive Feature)	Hydrological Characteristics	Soil Erosion Hazard	
					By Water	By Wind
Hawsley-Isolde 1161	Hawsley (55%); Isolde (35%)	4,439.2	60+ (unknown)	Excessively to somewhat excessively drained; very rapid permeability	Low	Severe
Blackhawk-Golconda-Orovada 154	Blackhawk (45%); Golconda (25%); Orovada (15%)	3,419.1	14-40 (duripan)	Well drained; moderate permeability	Low	Moderate
Orovada-Bliss 410	Orovada (45%); Bliss (45%)	2,531.2	60+ (unknown)	Well drained; moderate permeability	Low	Moderate
Davey-Hawsley 205	Davey (45%); Hawsley (40%)	2,169.6	60+ (unknown)	Somewhat excessively drained; moderately rapid to very rapid permeability	Low	Moderate
Hoot-Panlee-Rock outcrop 1075	Hoot (45%); Panlee (25%); Rock outcrop (15%)	1,836.0	10 to 60 (lithic bedrock)	Well drained; moderate to moderately slow permeability	Severe	Low
Burrita-Panlee-Burrita 658	Burrita (40%) Panlee (25%) Burrita (20%)	1,804.2	14-20 (lithic bedrock)	Shallow, well drained	Severe	Low
Soughe-Hoot 655	Soughe (60%); Hoot (25%)	1,695.5	10 to 20 (lithic bedrock)	Well drained; moderate to moderately slow permeability	Severe	Low
Davey-Goldrun 203	Davey (60%); Goldrun (25%)	1,589.7	40-60 (duripan)	Somewhat excessively drained; moderately rapid to rapid permeability	Low	Moderate

Mapping Unit	Soil Series	Acres in the Project Area	Soil Depth in Inches (Restrictive Feature)	Hydrological Characteristics	Soil Erosion Hazard	
					By Water	By Wind
Wholan 1025	Wholan (90%)	1,162.4	60+ (unknown)	Well drained; moderate permeability	Low	Moderate
Broyles-Orovada 772	Broyles (70%); Orovada (20%)	1,136.3	60+ (unknown)	Well drained; moderate to moderately rapid-rapid permeability	Low	Moderate
Soughe-Davey 1004	Soughe (45%); Davey (40%)	966.2	10 to 20 (lithic bedrock); 40 to 60 (duripan)	Well drained to somewhat excessively drained; moderate to moderately rapid permeability	Low	Severe
Davey-Blackhawk 204	Davey (60%); Blackhawk (25%)	765.4	14-60 (duripan)	Well drained to somewhat excessively drained; moderate to rapid permeability	Low	Moderate
Hawsley-Soughe-Panlee 1169	Hawsley (50%); Soughe (25%); Panlee (20%)	635.3	60+ (unknown); 10 to 60 (lithic bedrock)	Somewhat excessively drained to well drained; moderately rapid to very rapid permeability	Low	Severe
Rocconda-Hoot 1180	Rocconda (55%); Hoot (30%)	561.0	4 to 60 (lithic bedrock)	Well drained; moderately slow to slow permeability	Severe	Low
Connel 251	Connel (90%)	474.1	60+ (unknown)	Well drained; moderate permeability	Low	Moderate
Dune land 994	Dune land (90%)	466.3	N/A	N/A	Low	Severe
Hoot-Genaw 1078	Hoot (60%); Genaw (30%)	418.9	10 to 20 (lithic or paralithic bedrock)	Well drained; moderate to moderately slow permeability	Moderate	Low
Weso 614	Weso (90%)	352.5	60+ (unknown)	Well drained; moderate permeability	Low	Moderate
Goosel 861	Goosel (90%)	292.9	21 to 40 (lithic bedrock)	Well drained; slow permeability	Severe	Low
Davey-Broyles-Dun Glen 206	Broyles (35%); Davey (35%); Dun Glen (20%)	186.8	60+ (unknown)	Somewhat excessively drained to well drained; moderately rapid to rapid permeability	Low	Moderate
Broyles	Broyles (90%)	159.6	0 to 60	Well drained; slow permeability	Low	Moderate
Enko 501	Enko (85%)	154.1	60 (unknown)	Well drained; slow permeability	Low	Moderate
Weso 615	Weso (85%)	125.7	60+ (unknown)	Well drained; moderate permeability	Low	Moderate
Panlee-Davey-Soughe 1421	Panlee (40%); Davey (35%); Soughe (10%)	117.1	60+ (unknown); 10 to 60 (lithic bedrock)	Well drained to somewhat excessively drained; moderate to moderately rapid permeability	Moderate	Low
McConnel 331	McConnel (85%)	15.9	10 to 20	Somewhat excessively drained; moderate to moderately rapid permeablility	Low	Moderate

Mapping Unit	Soil Series	Acres in the Project Area	Soil Depth in Inches (Restrictive Feature)	Hydrological Characteristics	Soil Erosion Hazard	
					By Water	By Wind
Rocconda-Rock outcrop-Panlee 1184	Rocconda (55%); Panlee (15%); Rock outcrop (15%)		4 to 60 (lithic bedrock)	Well drained; moderate to slow permeability	Severe	Low

Foothills and hills generally have a water erosion hazard of severe, and wind erosion hazard of low. Piedmonts generally have a water erosion hazard of low and wind erosion of moderate. Sand sheets and dunes generally have a water erosion hazard of low, and wind erosion of severe. The Hawsley-Isolde association has a low soil erosion hazard for water and a severe erosion hazard for wind. The Blackhawk-Golconda-Orovada association has a low erosion hazard for water and a moderate erosion hazard for wind. Figure 3.14.2 shows the wind erosion hazard potential and Figure 3.14.3 shows the water erosion hazard potential of the soils in the Project Area.

3.15 Special Status Species

Special status species are federally listed or proposed and BLM sensitive species, which include both *federal candidate species* and delisted species within five years of delisting (BLM Manual 6840 – Glossary of Terms).

Information from the Nevada Natural Heritage Program (NNHP 2008) and the USFWS (USFWS 2009) indicate that there are no federally threatened, endangered, or candidate plant or animal species as defined by the Endangered Species Act (ESA) known to occur within the Project Area.

A special status plant survey was conducted during the second week of May 1999 and the first and second weeks of June 1999 by Environmental Management Associates (EMA), and in the second week of June 2009 by Enviroscientists. Existing information was gathered from the NRCS and a previous study of the area titled *Environmental Assessment, 1989 Exploration Program, Sandman Project, Humboldt County, Nevada* (BLM 1989).

Wildlife field surveys were conducted by qualified biologists in the Sandman Project Area by Wildlife Resource Consultants May 11-13, 1999. Subsequent surveys were conducted by Enviroscientists, Inc. on May 10, and 11, 2007, October 6-10, 2008, and June 10-12, 2009.

3.15.1 Sensitive Species

Sensitive species are species that require special management consideration to avoid potential future listing under the ESA and that have been identified in accordance with procedures set forth in BLM Manual 6840. BLM policy in BLM Manual 6840.06 states, “Actions authorized by the BLM shall further the conservation and/or recovery of federally listed species and conservation of Bureau sensitive species. Note that “conservation” has a different meaning depending on whether it is referring to ESA listed species or Bureau sensitive species. See glossary. Bureau sensitive species will be managed consistent with species and habitat

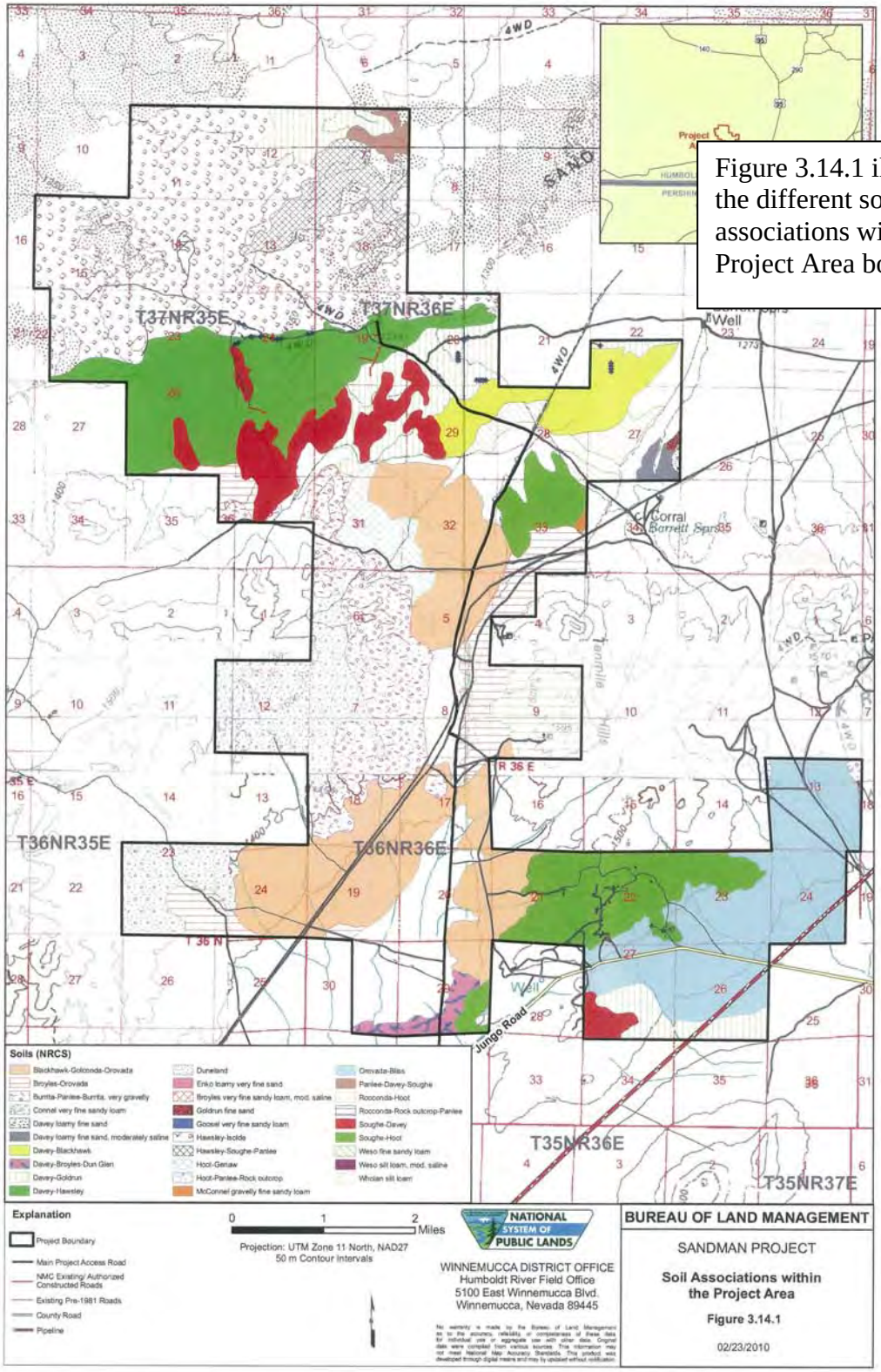


Figure 3.14.1 illustrates the different soil associations within the Project Area boundary.

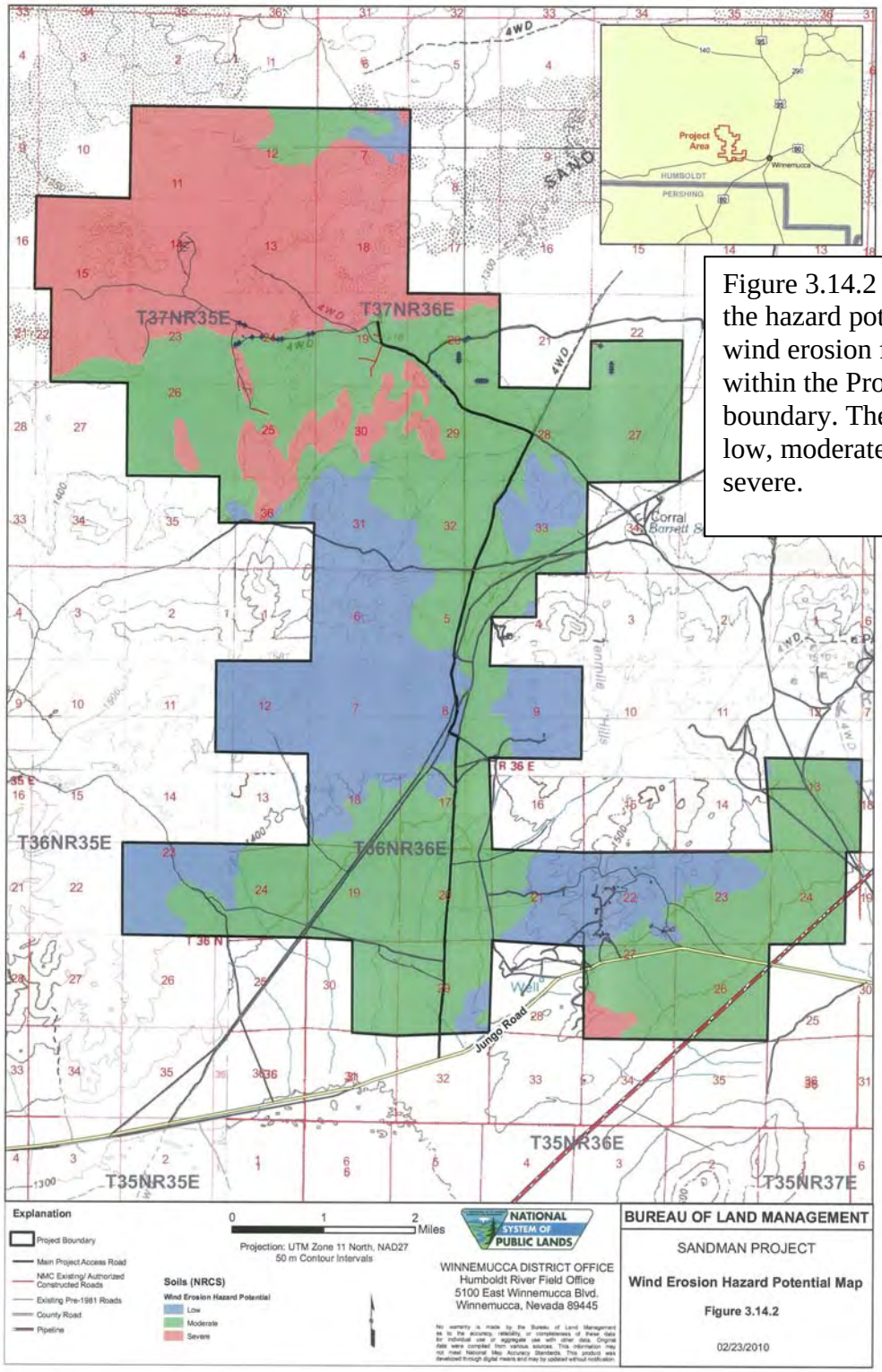


Figure 3.14.2 illustrates the hazard potential of wind erosion for soils within the Project Area boundary. The ratings are low, moderate, and severe.

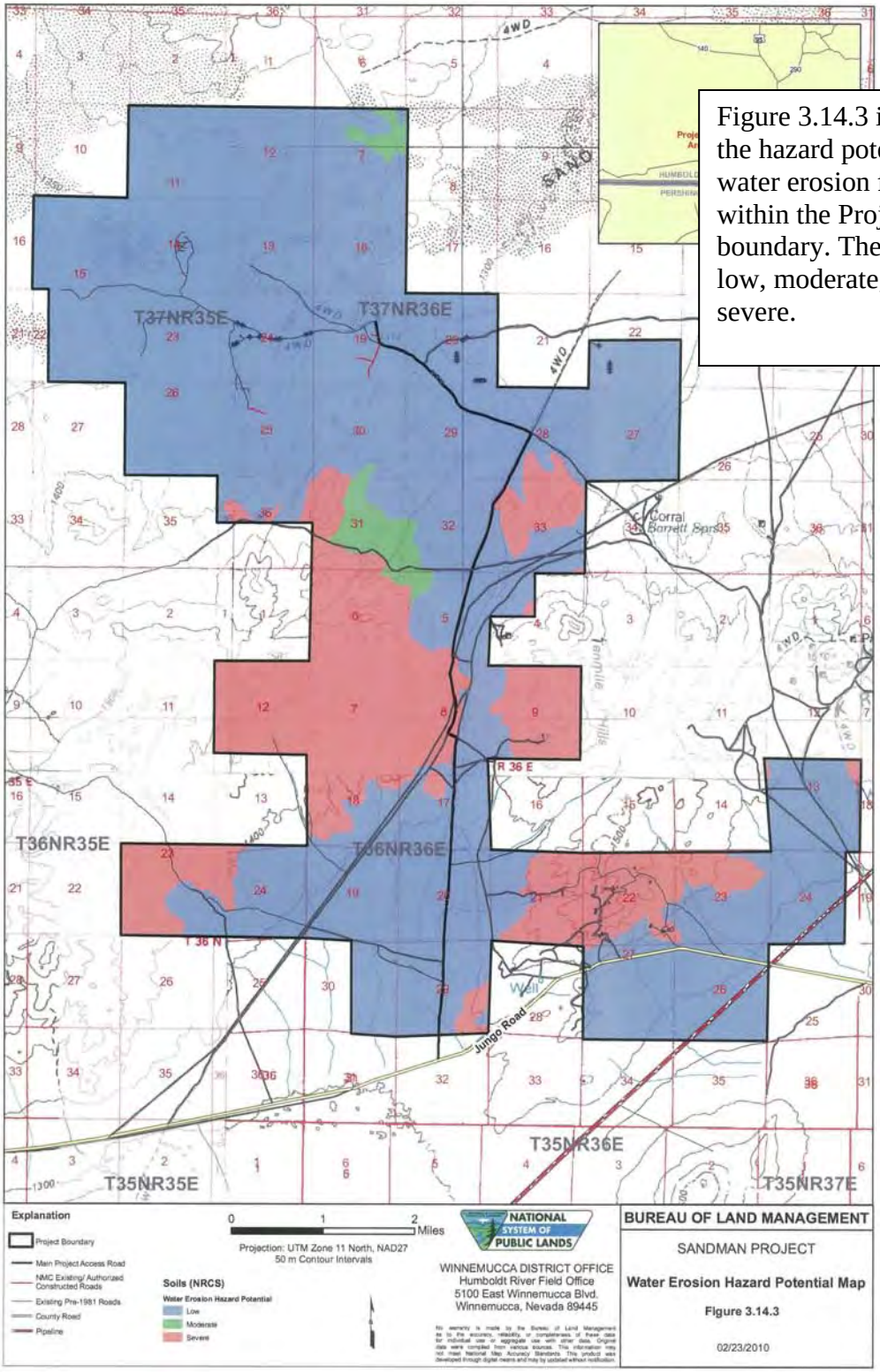


Figure 3.14.3 illustrates the hazard potential of water erosion for soils within the Project Area boundary. The ratings are low, moderate, and severe.

management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA."

The following sensitive species are discussed, because they either have been observed in the Project Area or habitat characteristics indicate they may be present in the Project Area.

Sensitive Plant Species

Two BLM sensitive plant species identified by the NNHP and the BLM may potentially occur within the Project Area, dune penstemon (*Penstemon arenarius*) and Nevada oryctes (*Oryctes nevadensis*).

Dune Penstemon

Dune penstemon, a BLM sensitive species, is a perennial herb from a buried root crown occurring at elevations ranging 3,920 to 5,960 feet amsl. This species occurs in deep loose sandy soils of valley bottoms, aeolian deposits, and dune skirts, often in alkaline areas, sometimes on road banks and other recovering disturbances crossing such soils, in the salt desert scrub vegetation community with associated species Nevada dalea (*Psorothamnus polydenius*), Indian ricegrass (*Achnatherum hymenoides*), Greyer's milkvetch (*Astragalus geyeri* var. *geyeri*), fourwing saltbush (*Atriplex canescens*), shadscale (*Atriplex confertifolia*), littleleaf horsebrush (*Tetradymia glabrata*), sand gilia (*Gilia leptomeria*), Nuttall's crinklemat (*Tiquilia nuttallii*), Bailey's greasewood (*Sarcobatus baileyi*), rabbitbrush (*Chrysothamnus* sp.), and Nevada ephedra (*Ephedra nevadensis*). This species is dependent on sand dunes or deep sand. Dune penstemon flowers in late-spring with the range of most frequent survey months from May to June. Populations of this species have been found in Churchill, Mineral, and Nye Counties, Nevada (NNHP 2009). Habitat for dune penstemon is located in the northern portion of the Project Area; however, this species was not located in the Project Area during the 1999 or 2009 surveys.

Nevada Oryctes

Nevada oryctes, a BLM sensitive species, is a small, annual plant with concealed flowers. Habitat for this species is located on stabilized dunes, washes, and valley flats on various slopes and aspects at elevations ranging 3,900 to 5,960 feet amsl. Associated plants include the following: saltbush (*Atriplex* sp.); Indian ricegrass; horsebrush (*Tetradymia* sp.); and spiny hopsage (*Grayia spinosa*). Nevada oryctes flowers in late-spring with the range of most frequent survey months from May to June. Populations of this species have been found in Churchill, Humboldt, Mineral, Pershing, and Washoe Counties, Nevada (NNHP 2009).

Nevada oryctes was not located in the Project Area during the 1999 or 2009 surveys. Although appropriate habitat occurs in the Project Area for Nevada oryctes, the dune habitat in the Project Area was surveyed at the appropriate time of year and the species was not located in the Project Area.

Sensitive Wildlife Species

The Project is located near known populations of money buckwheat (*Eriogonum nummulare*), which is not a BLM sensitive species; however, money buckwheat is the host plant for two BLM sensitive butterfly species, including Rice's blue (*Euphilotes pallescens ricei*) and Honey lake blue (*Euphilotes pallescens calneva*). A special status plant survey conducted in June 2009 by Enviroscientists did not locate money buckwheat. Since money buckwheat was not located in the Project Area, habitat for Rice's blue and Honey Lake blue butterflies is not present and these species were not observed; therefore, Rice's blue and Honey lake blue are not further analyzed in this EA.

Humboldt Serican Beetle

Enviroscientists (2010c) prepared a Natural History Memo for the Humboldt Serican Beetle. The Humboldt serican scarab is a BLM sensitive species and NNHP at risk species identified by the NNHP as occurring outside of the Project Area. There are no known occurrences within the Project Area. According to the NNHP and Jeff Knight (Nevada State Entomologist at the Nevada Department of Agriculture), the Humboldt serican scarab has been collected only one time in Nevada using an ultraviolet light trap. According to the NNHP this collection occurred on July 9, 1963, in the sand dunes approximately ten miles north of Winnemucca, just east of U.S. Highway 95, in the area legally described as the SE/4 of SW/4 of T37N, R38E, section 3 (Figure 3.15.1) approximately 11.8 miles east of the Project Area boundary. According to the Gap Analysis Project (GAP) database approximately 108,545 acres of dune habitat are located in the dune complex surrounding the Project Area. The GAP database indicates that there are approximately 5,656 acres of dune habitat within the Project Area (or approximately 5.2 percent of the total potential habitat).

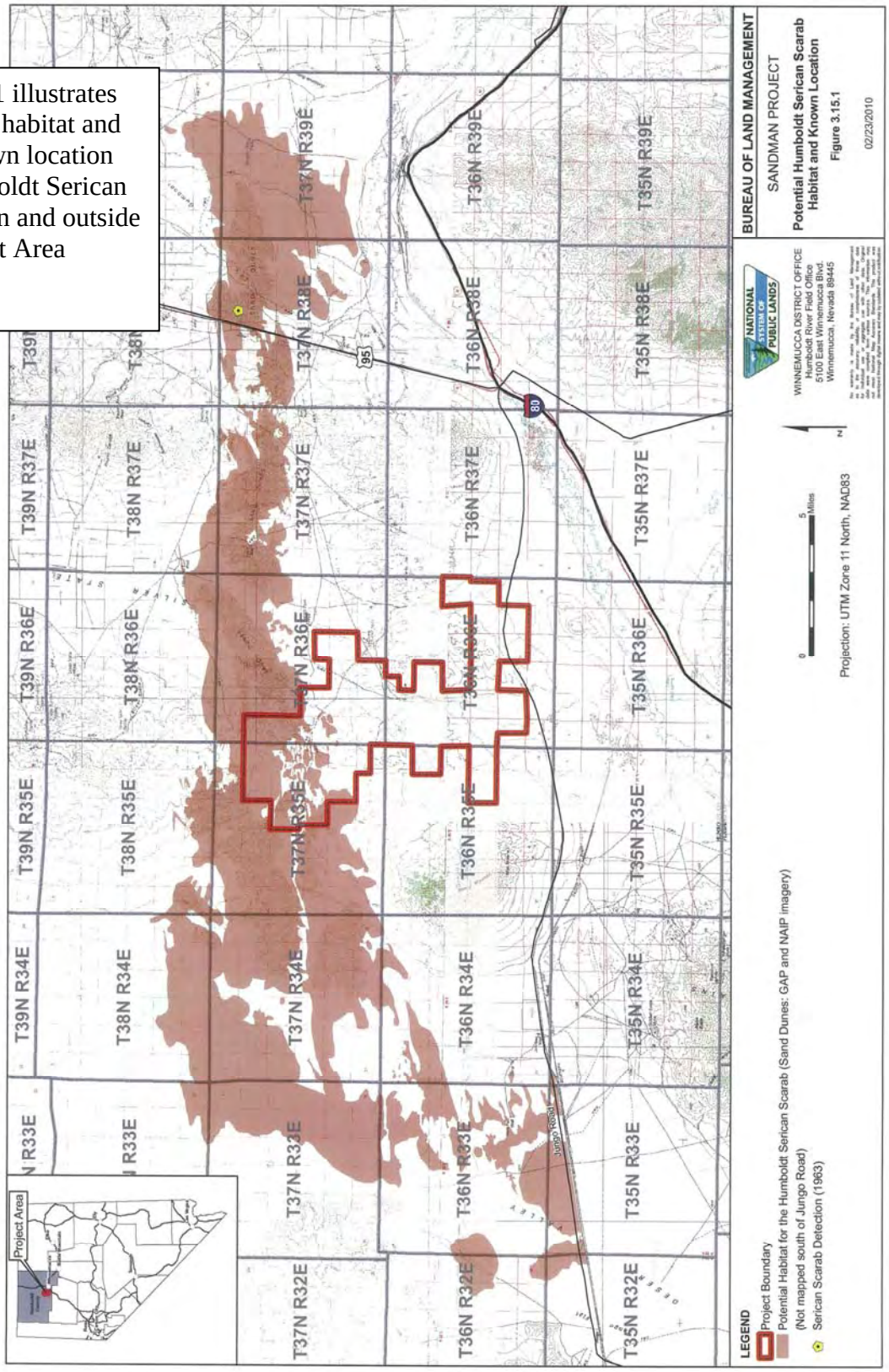
Vesper Sparrow

Vesper sparrow, a BLM sensitive species, is found in deserts, grasslands, savannas, shrublands, and agricultural areas. This species migrates in flocks. Vesper sparrows nest on the ground, often in a small depression near a clump of grass. They forage on the ground, along fencerows, and in weedy areas for seeds, waste grain, and insects. Although vesper sparrow has not been detected during surveys, the entire Project Area would be considered appropriate habitat for vesper sparrow.

Greater Sage-Grouse (*Federal Candidate)*

Greater sage-grouse (*Centrocercus urophasianus*), a BLM sensitive species, is largely dependent on sagebrush for nesting and brood rearing and feed almost exclusively on sagebrush leaves during the winter. They are known to occur in foothills, plains, and mountain slopes where sagebrush meadows are in close proximity. Both a dense sagebrush overstory and an herbaceous understory of grasses are important to provide shade and security, and both new herbaceous growth and residual cover are important in the understory. Breeding sites, or "leks," are usually situated on ridge tops or grassy areas surrounded by a substantial brush and herbaceous component.

Figure 3.15.1 illustrates the potential habitat and the one known location of the Humboldt Serican Scarab within and outside of the Project Area boundary.



In early spring, males gather in leks where they strut to attract females. Greater sage-grouse nest in thick cover in sagebrush habitat beneath sagebrush or other shrubs. Nests are on the ground in a shallow depression with an average distance between nest sites and nearest leks of 0.7 to 3.9 miles; however, females may move more than 12.4 miles from a lek to nest. The territory of this species ranges from the mid-west to the western United States. No part of the Project Area is located within a greater sage-grouse population management unit (PMU).

Greater sage-grouse winter areas are located approximately 3.5 miles north of the Project Area in the southern portion of the Slumbering Hills PMU (personal communication with Kenny Pirkle of the Nevada Department of Wildlife, October 14, 2009). No greater sage-grouse or their sign (e.g., scat, feathers, tracks, and/or egg shells) were found within the Project Area during the course of the May 2007 or October 2008 surveys. Also, no greater sage-grouse leks are located within a two-mile radius of the Project Area. A fire that occurred in 2006 burned the sagebrush habitat in the west half of T37N, R36E, section 29, where greater sage-grouse droppings had been recorded on the rock outcrop in wildlife surveys that had been conducted in May 1999 (Figure 5.1.1). The existing sagebrush stands have been reduced to small stumps and are surrounded by cheatgrass. Additional areas of sagebrush occur in the Project Area; however, no greater sage-grouse or sign were detected during the May 2007 or October 2008 surveys.

Loggerhead Shrike

Loggerhead shrike, a BLM sensitive species, is found in most open shrubland communities including the following: Mojave scrub; Joshua tree; salt desert scrub; sagebrush; lowland riparian; and montane riparian. This species can also be found in agricultural and cultivated areas. They generally avoid habitats without a shrub component or dense woodland. Loggerhead shrikes nest in shrubs or small trees in areas dominated by grasses. This species preys on large insects, small reptiles, birds, and rodents. Loggerhead shrike were identified in the Project Area during the May 1999 surveys.

Prairie Falcon

Prairie falcon, a BLM sensitive species, is restricted to western North America commonly in areas with cliffs adjacent to broad, arid, or semi-arid valleys. Prairie falcons are present in Nevada throughout the year. The highest densities of prairie falcons in Nevada are located in or near the mouths of narrow canyons, overlooking riparian vegetation and agricultural lands. The highest nesting densities in Nevada occur in the northern counties (Herron et al. 1985). A prairie falcon was identified in the Project Area during the May 1999 surveys.

Western Burrowing Owl

Lower elevations provide nesting and hunting habitat for this BLM sensitive species. Preferred nesting habitat for western burrowing owl, a BLM sensitive species, consists of areas previously dominated by dense stands of big sagebrush that have burned and converted to low grass species, with a few remaining sagebrush trunks for perches. Nesting normally takes place in abandoned badger burrows. Prey consists of rodents and insects, primarily beetles during the breeding season. Western burrowing owls were observed in the Project Area during the May 2007 survey.

Pallid Bat

Pallid bat (*Antrozous pallidus*), a BLM sensitive species, is found in arid deserts and grasslands within cliffs and shrublands, often near rock outcrops and water, and occasionally in evergreen and mixed coniferous woodland. They roost in rock crevices or buildings and sometimes in caves, snags, or mines. Their primary food is arthropods that they capture on the ground. Pallid bats are found throughout Nevada. According to the Nevada Department of Wildlife (NDOW) pallid bat occurrences have been documented in the Project Area (NDOW 2008). Pallid bats are known to occur in old mine workings in the Ten Mile Hills, which is in the southeastern corner of the Project Area (BLM 2008).

Townsend's Big-Eared Bat

Townsend's big-eared bat (*Corynorhinus townsendii*), a BLM sensitive species, is found in a variety of habitat types including desert, native prairies, coniferous forests, mid-elevation mixed conifer, and riparian communities: specifically piñon-juniper; mahogany; white fir; blackbrush; sagebrush; salt desert scrub; and agricultural lands. This species is dependent on cavern dwellings including mines, caves, trees, and buildings. Townsend's big-eared bats are loyal to natal sites and generally do not venture beyond six miles from a roost site. Maternal colonies are usually established between March and June and disband in late August or early September. Winter hibernating colonies usually form by late October. Townsend's big-eared bats feed mainly on moths and forage in open forest habitats. Townsend's big-eared bat occurrences have been documented in the Project Area (NDOW 2008). Townsend's big-eared bats are known to occur in old mine workings in the Ten Mile Hills, which is in the southeastern corner of the Project Area (BLM 2008). These bats are also known to forage in the Project Area.

Western Small-Footed Myotis

Western small footed myotis (*Myotis ciliolabrum*), a BLM sensitive species, roosts in crevices occurring in mines, caves, buildings, rock crevices, hollow trees, and in exfoliating bark on trees. They are found in desert scrub, grasslands, sagebrush steppe, blackbrush (*Coleogyne* sp.), greasewood, piñon-juniper woodland, pine-fir forests, agricultural, and urban areas. Western small footed myotis forages in open areas for moths, flies, ants, and beetles. This species occurs throughout Nevada. Western small footed myotis occurrences have been documented in the Project Area (NDOW 2008). Western small-footed myotis is known to occur in old mine workings in the Ten Mile Hills, which is in the southeastern corner of the Project Area (BLM 2008). These bats are also known to forage in the Project Area.

Pygmy Rabbit

Pygmy rabbit (*Brachylagus idahoensis*), a BLM sensitive species, typical habitat consists of dense stands of big sagebrush growing in deep loose soils. The rabbits dig burrows three inches in diameter and a burrow may have three or more entrances (NatureServe 2008). Burrows are relatively simple and shallow, often no more than seven feet in length and less than four feet deep with no distinct chambers. The winter diet of pygmy rabbits is composed of up to 99 percent sagebrush. During spring and summer, their diet may consist of roughly 51 percent sagebrush, 39 percent grasses, and ten percent forbs. The pygmy rabbit is believed to be one of only two rabbits in North America that digs its own burrows. During winter, pygmy rabbits use

extensive snow burrows to access sagebrush forage, as travel corridors among their underground burrows, and possibly as thermal cover (USFWS 2003).

No pygmy rabbits or their sign (e.g., burrows, runways, or scat) were identified in the Project Area during surveys. Areas of tall, dense sagebrush within the Project Area did not provide greater than 30 percent canopy cover, the preferred habitat for pygmy rabbit

3.15.2 Species with Other Special Designations

Information regarding species with other special designations, including species protected by NRS Chapter 501, was requested from the NNHP.

Plant Species with Other Special Designations

One special status plant species was identified by the NNHP that may potentially occur within the Project Area, Lahontan indigobush (*Psorothamnus kingii*) a NNHP at risk species.

Lahontan Indigobush

Lahontan indigobush, a NNHP sensitive species, is a rhizomatous herb. This species is dependant on sand dunes or deep sand and is found in active dunes, interdune areas, vegetated dunes and aeolian deposits in the shadscale, salt desert, and sagebrush vegetation communities. Associated species are as follows: horsebrush; fourwing saltbush; Geyer's milkvetch; lemon scrufpea (*Psoralidium lanceolatum*); Indian ricegrass; sand gilia; rabbitbrush; and big sagebrush (*Artemisia tridentata*). The elevation of this species ranges from 4,140 to 5,250 feet amsl. Lahontan indigobush flowers late-spring to summer and the range of most frequent survey months is from June through October. This species is native to Nevada and has been found in Churchill and Humboldt Counties (NNHP 2008).

Lahontan indigobush was abundantly located throughout suitable dune habitat in the northern portion of the Project Area during both the 1999 and 2009 surveys. Suitable habitat consisted of the west-facing slopes of dunes ranging in slope from zero to 40 percent. Tens of thousands of plants were located in the Project Area. Suitable habitat for Lahontan indigobush extends north, east, and west of the northern portion of the Project Area.

All cacti and yucca species are protected by Nevada state law (NRS 527.060.120). No species of cacti or yucca were identified in the Project Area during surveys.

Wildlife Species with Other Special Designations

Great Basin Collared Lizard

Great Basin collared lizard (*Crotaphytus bicinctores*), a species protected under NRS Chapter 501, is found in mid-elevation desert scrub, sagebrush, badlands, dunes, cliffs, canyons, mesquite bosques, desert washes, barren landscapes, invasive grasslands, and forblands. They occur in xeric, rocky areas with sparse vegetation. They feed on anthropods, other reptiles, and occasionally on flowers and leaves. Great Basin collared lizards are inactive during cold weather and occur throughout Nevada excluding Elko County. A Great Basin collared lizard was observed during the October 2008 survey.

Desert Horned Lizard

Desert horned lizard (*Phrynosoma platyrhinos*), a species protected under NRS Chapter 501, is found in arid regions in sandy flats, alluvial fans, washes, and on the periphery of dunes within creosote bush, greasewood, and cactus. Their primary diet consists of ants; however, they also consume beetles, spiders, and some plant material. Desert horned lizards occur throughout Nevada except in the western portion of the state in the higher elevations that abut Lake Tahoe. Desert horned lizard was observed during the May 1999 survey in the Project Area.

Kit Fox

Kit fox (*Vulpes macrotis*), a species protected under NRS Chapter 501, is found primarily in open desert, shrubby, or shrub-grass habitats. In the Mojave Desert, kit fox inhabits creosote bush (*Larrea tridentata*). In the Great Basin, kit fox occupies shadscale, greasewood (*Sarcobatus vermiculatus*), and sagebrush (*Artemisia* sp.). Kit foxes feed on rodents, birds, reptiles, and insects. This species is mainly nocturnal and breeds December through February. Litters of four to five pups are born in February or March. Kit foxes are found in northwestern and north-central Nevada through southern Nevada. Kit fox scat was identified in the Project Area during the May 1999 and October 2008 surveys.

3.16 Vegetation

The Project is located within the Lahontan Basin floristic region of the Intermountain physiographic region in north-central Nevada. This region is defined by mountain ranges that are smaller and less elongated with large irregularly shaped valleys located between mountain ranges. The Lahontan Basin floristic region covers approximately 14,250 square miles of Nevada.

Vegetation in the Project Area consists of sagebrush/bunchgrass, stabilized dune desert/bunchgrass, budsage/bunchgrass, grasslands, unstable dunes, and salt desert scrub. Eight wildland fires have occurred in the Project Area between 1985 and 2001 (BLM 2009). Approximately 6,686 acres or 24.2 percent of the 27,588-acre Project Area lands were burned by these wildfires (Figure 5.1.1). Many of the burned areas consist of cheatgrass with additional native species that have naturally recolonized the area as well as seeded species within the old fire perimeters (BLM 2008).

The sagebrush/bunchgrass community occupies approximately 17,451 acres in the Project Area. Sagebrush/bunchgrass occurs on slopes of all aspects. The basal and canopy cover in this vegetation community is between ten and 30 percent. The shrub density is greater in the valleys and alluvial fans with the greatest density in ephemeral drainages. Shrubs observed within this community consist of the following: Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*); budsage (*Picrothamnus desertorum*); silver sage (*Artemisia cana*); spiny hopsage (*Grayia spinosa*); spineless horsebrush (*Tetradymia canescens*); and winterfat (*Krascheninnikovia lanata*). Herbaceous cover typically includes grasses such as squirreltail (*Elymus elymoides*), Indian ricegrass, cheatgrass, and Sandberg bluegrass (*Poa secunda*), and forbs such as flixweed (*Descurania sophia*), milkvetch (*Astragalus* sp.), buckwheat (*Eriogonum* sp.), and prickly phlox (*Leptodactylon pungens*) (EMA 1999).

Stabilized desert dune/bunchgrass occupies approximately 4,950 acres in the Project Area. This vegetation community occurs on slopes of all aspects. Shrubs observed in this community consist of the following: budsage; shadscale; rabbitbrush; Wyoming big sagebrush; Kearney's buckwheat (*Eriogonum kearneyi*); spineless horsebrush; littleleaf horsebrush (*Tetradymia glabrata*); and spiny hopsage. Forbs observed in this community are: lance-leaved scruf-pea (*Psoralidium lanceolatum*); desert evening primrose (*Oenothera caespitosa*); and penstemon (*Penstemon* sp.). Grasses observed in this community consist of Indian ricegrass and needle and thread (*Hesperostipa comata*) (EMA 1999).

Budsage/bunchgrass occupies 1,788 acres in the Project Area. Budsage/bunchgrass occurs on west and southwest facing slopes. Shrubs observed within the budsage/bunchgrass community consist of the following: budsage; spineless horsebrush; little-leaf horsebrush; shadscale; fourwing saltbrush; rabbitbrush; and Wyoming big sagebrush. Subshrubs observed are snakeweed (*Gutierrezia* sp.). Forbs observed consist of clasping pepperweed (*Lepidium perfoliatium*) and flixweed. Grasses observed include the following: cheatgrass; squirreltail; Indian ricegrass; needle and thread; Sandberg bluegrass; and thurber needlegrass (*Achnatherum thurberianum*) (EMA 1999).

Grasslands occupy 1,410 acres in the Project Area and are dominated by cheatgrass.

Unstable dunes occupy approximately 1,209 acres in the Project Area. Unstable dunes occur in the northern portion of the Project Area on slopes of all aspects. Subshrubs observed in this community consist of the following: Lahontan indigobush. Forbs observed in unstable dunes include sand dock (*Rumex venosus*) and lanced-leaf scruf-pea. Grasses observed in this community consist of the following: Indian ricegrass and needle and thread (EMA 1999).

Salt desert scrub occupies approximately 635 acres in the Project Area. Salt desert scrub occurs in the northeastern portion of the Project Area on southwest facing slopes. Shrubs that occur in this vegetation community consist of the following: Bailey's greasewood; Wyoming big sagebrush; fourwing saltbush; spiny hopsage; budsage; and shadscale. One forb, lance-leaf scruf-pea was observed. Grasses such as Indian ricegrass, cheatgrass, and needle and thread were observed in the salt desert scrub vegetation community (EMA 1999).

3.17 Visual Resources

Scenic quality is a measure of the visual appeal of a parcel of land. Section 102(a)(8) of FLPMA emphasizes protection of the quality of scenic resources on public lands. Section 101(b) of NEPA requires that measures be taken to ensure that aesthetically pleasing surroundings be retained for all Americans.

The BLM initiated visual resource management (VRM) by establishing VRM class designations during planning processes to manage the quality of the landscape and minimize potential impacts to visual resources resulting from development activities. In determining VRM class designations, the inventory process considers the scenic value of the landscape, viewer sensitivity to the scenery, and the distance of the viewer to the subject landscape. These management classes identify various permissible levels of landscape alteration, while protecting the overall visual quality of the region. Management classes are divided into four levels (Classes I, II, III, and IV), with Class I designated as most protective of the visual resources.

The Project Area is managed to achieve VRM Class IV standards. The objective of this class is to provide for management activities that 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 landscape elements.

Previous mining activities have occurred in the Project Area resulting in constructed roads and mine sites.

The Project is located in a remote area of rolling hills and steep mountains with little or no development. Scattered ranches are they only source of scattered light making dark skies common.

3.18 Wildlife

General Wildlife

Terrestrial wildlife resources in the Project Area are typical of the northern Great Basin. A wide variety of wildlife species common to the Great Basin ecosystem may be found in the Project Area. Eight wildland fires have occurred in the Project Area between 1985 and 2001 (BLM 2009). Approximately 6,686 acres or 24.2 percent of the 27,588-acre Project Area lands were burned by these wildfires (Figure 5.1.1). Wildlife habitat has been altered within the Project Area as a result of the wildland fires. The Project Area topography includes mountains, valleys, hills, and sand dunes. Several ephemeral drainages are located within the Project Area. The Barrett Springs area, which is located in T37N, R36E, section 34 is the only known surface water in the vicinity of the Project Area. Existing pre-1981 roads, previous mine and exploration disturbance, gravel pits, a pipeline, water and monitoring wells, dirt roads, one county road, and residences and outbuildings associated with surface occupancy occur within the Project Area.

Wildlife species detected in the Project Area included the following: greater sage-grouse; chukar (*Alectoris chukar*); mule deer (*Odocoileus hemionus*); pronghorn antelope (*Antilocapra americana*); coyote (*Canis latrans*); badger (*Taxidea taxus*); kit fox; least chipmunk (*eutamias minimus*); antelope ground squirrel (*Ammospermophilus leucurus*); Townsend's ground squirrel (*Spermophilus towsendii*); woodrat (*Neotoma* sp.); gopher (*Thomoys* sp.); black-tailed jackrabbit (*Lepus californicus*); desert horned lizard; leopard lizard (*Gambelia wislizenii*); sagebrush lizard (*Sceloporus graciosus*); western fence lizard (*Sceloporus occidentalis*); Great Basin collared lizard; Great Basin gopher snake (*Pituophis catenifer deserticola*); scorpion (*Hadrurus* sp.); beetle (*Eleodes* sp.); June beetle (Phyllophaga errans); black widow (*Latrodectus Hesperus*); orb spider (*Argiope* sp.); sheep moth (*Hemileuca* sp.); skipper (Family: Hesperiidae); and blue butterfly (Family: Polyommatinae). Greater sage-grouse, kit fox, desert horned lizard, and Great Basin collared lizard, are discussed in Section 3.12. The migratory birds observed in the Project Area are listed in Section 3.5.

Big Game Species

Mule deer are found in sagebrush, desert shrub, chaparral vegetation communities, and grasslands with shrubs. Year-round mule deer habitat is located approximately 0.5 mile north of the Project Area in the Slumbering Hills. Mule deer are known to reside on Blue Mountain (NDOW 2009). This species browses on a wide variety of woody plants, grasses and forbs. Mule deer tracks and scat were observed in the western and southern portions of the Project Area during the October 2008 surveys. Mule deer were distinguished from pronghorn tracks in the Project Area by the biologist's observation of the dew claw imprint from the mule deer tracks on the soft sandy soils.

Pronghorn antelope prefer gentle rolling topography, flat prairie, and plateaus. The entire Project Area is within year-round pronghorn antelope habitat (NDOW 2009). Pronghorn antelope were observed moving along the road that traverses T37N, R36E, section 14 during the May 1999 surveys and scat and tracks were concentrated in sagebrush habitat along the east-facing side of the hill in T37N, R35E, section 14. Pronghorn antelope were also observed during the June 2007 surveys. Pronghorn antelope scat was observed during the October 2008 surveys in sagebrush habitat.

Game Birds

Upland game birds have been recorded including greater sage-grouse (discussed in Section 3.12) and chukar. Moderate chukar populations occur in and near the Project Area. Chukar are commonly found in dry shrublands with a prominent grass understory, often along rocky slopes, mesic habitats, and in rugged canyons. Chukar scat and roosts were observed during the October 2008 surveys throughout the Project Area.

4 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

The direct and indirect effects of the Proposed Action and the No Action Alternative on resources present and brought forward for analysis are discussed in this section. Cumulative impacts are discussed separately in Chapter 5. Direct effects are caused by the action and occur at the same time and place. Indirect effects 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 (40 CFR 1508.8).

4.1 Proposed Action

4.1.1 Air Quality

The Project has the potential to disturb 500 acres. Travel on access roads and drilling within the area of the Proposed Action would create emissions which would have a potential impact on air quality. Fugitive dust, in the form of PM_{10} and $PM_{2.5}$, would be caused by the operation of the following equipment: up to ten drill rigs; bulldozers; and road graders. Vehicle emissions, in the form of NO_x, SO_2, CO, and greenhouse gases, would occur anytime the internal combustion engines on the vehicles are operating. Table 4.1-1 summarizes the equipment fugitive dust and vehicle combustion emissions associated with the Project (Enviroscientists 2010b).

Table 4.1-1: Fugitive Dust and Combustion Emissions Associated with the Project

Equipment	Total Emissions (tons/year)				
	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO
Drilling	1.072	0.998	1.305	27.836	18.510
Bulldozing	0.099	0.084	0.044	0.931	0.619
Grading	0.556	0.086	0.020	0.427	0.284
Light Duty Gasoline Trucks	0.002	0.001	0.001	0.074	1.226
Light Duty Diesel Trucks	0.001	0.001	0.001	0.008	0.010
Light Plant	0.074	0.074	0.069	1.040	0.224
Compressor Trailer	0.137	0.137	0.127	1.925	0.415
Total Emissions	**1.941**	**1.381**	**1.567**	**32.241**	**21.288**

All exploration activities with surface disturbance exceeding 20 acres are required to obtain a Surface Area Disturbance (SAD) permit from the BAPC. This SAD permit was issued for the Project on January 5, 2010 (SAD Operating Air Permit # AP1041-2383). This permit required the preparation and, submittal of a Dust Control Plan to control the emissions of fugitive dust at the operation. The BAPC's issuance of the SAD permit and requirement that the Project operate

in compliance with the Dust Control Plan are intended to ensure that fugitive dust emissions are minimized to the maximum extent possible using BMPs. The Plan stipulates that travel on roads within the Project Area would be conducted at prudent speeds. The Dust Control Plan includes watering roads to suppress dust and following speed limits as measures to minimize the potential effects of fugitive dust on air quality. Two of the major access roads have improved gravel surfaces, which reduce the amount of fugitive dust generated. NMC has committed to a 25 mph speed limit in areas that have a silty or powdery surface, which would also reduce the amount of fugitive dust generated. Other roads under the Proposed Action whose surface became degraded through travel or weather would be graveled to reduce the amount of fugitive dust generated. Reclamation of proposed surface disturbance would gradually eliminate fugitive dust from wind erosion. Vehicle emissions are regulated by the USEPA and controlled by specific design requirements when the vehicle is manufactured.

4.1.2 Cultural Resources

NMC would avoid, or mitigate impacts to, all eligible or the contributing element portions of cultural resources within the Project Area. As a rule, all eligible or contributing elements of an eligible site would be avoided by a buffer zone of 100 feet. In cases of historic roads the non-contributing elements would continue to be utilized and the contributing elements would not be utilized for transportation. The contributing elements would continue to be avoided by the 100 feet buffer zone during all other activities. If eligible or the contributing elements to an eligible site could not be avoided the site would be mitigated through a data recovery plan approved by the BLM in consultation with the SHPO.

4.1.3 Invasive, Nonnative Species

The strategy for noxious weed management is to, “prevent and control the spread of noxious weeds through local and regional cooperative efforts…to ensure maintenance and restoration of healthy ecosystems on BLM managed lands." Noxious weed control would be based on a program of “prevention, education, detection and rapid response (control) of small infestations.” Surface disturbance as a result of the Proposed Action may have the potential to facilitate the introduction or establishment of invasive, nonnative species, and noxious weeds. These impacts would be minimal based on implementation of the environmental protection measures outlined in Section 2.1.12 and reclamation.

4.1.4 Migratory Birds

The environmental protection measures outlined in Section 2.1.12 would prevent direct impacts to migratory birds in the Project Area. Potential indirect impacts occur to migratory birds as a result of vegetation removal and activities associated with the Proposed Action. Migratory birds foraging in the Project Area during exploration activities would likely leave the immediate area, resulting in a temporary spatial redistribution of individuals or habitat-use patterns during the Project. Such redistribution would not have a long-term effect because undisturbed and suitable habitat exists around the Project Area. No long-term impacts are likely to occur because reclamation and reestablishment of vegetation would occur approximately three years after Project completion.

4.1.5 Native American Religious Concerns

To date, no TCPs or Executive Order 13007 sites have been identified within the Project Area that might be impacted by the Proposed Action or alternatives. Consultation is ongoing.

4.1.6 Noise

Potential impacts associated with noise would be associated with traffic, construction, and drill rig operation. The Environmental Noise Analysis analyzed impacts associated with these noise producing activities. The predicted L_{dn} value for existing traffic at a distance of 50 feet from the centerline of Jungo Road is 63.4 dB. The traffic noise level is predicted to be less than 55 dB L_{dn} at distances exceeding about 180 feet from the roadway centerline. The Project could increase traffic volume by five percent and would; therefore, have minimal traffic noise impacts.

Noise due to construction activity is temporary, use of heavy equipment and noisy activities are limited to daytime hours, no surface blasting is planned, and all industry-standard noise abatement measures are implemented for noise-producing equipment. In addition, based on the topography of the Project Area, much of the construction equipment would be shielded from view of the nearest receivers by topography, which naturally reduces noise levels. The maximum noise levels received at the nearest ranch, which is about 3.5 miles away from the nearest areas where drilling would occur, would be reduced by about 50 dB as compared to the range of values of 70 to 90 dB; therefore, maximum construction noise levels at the nearest ranch house would be in the range of about 15 to 35 dB, well within regulatory limits. No impacts are expected from construction activities.

The ENM was run to predict hourly noise levels at the nearest existing receiver, which is a ranch about seven miles southeast of the section 22 site. It was assumed that the drill rig would be operated continuously on a 24-hour per day basis for a period of one or more weeks. The predicted drill rig noise level at seven miles distant is approximately 1 dB $L_{eq;}$ therefore, the Project-related noise levels in terms of the hourly noise level standards assumed for the analysis would be very low and likely undetectable. There would be minimal impacts from drill rig noise.

Over all, based on the Environmental Noise Analysis, there would be no noise related impacts from this Project.

4.1.7 Water Quality

Surface Water

The Proposed Action could result in impacts to surface water quality as a result of spills and sedimentation from surface disturbance or erosion from pump test water discharge. The potential impacts to surface water quality from spilled petroleum products and drilling fluids would be minimized by the implementation of the Spill Prevention Plan included in the Plan. In addition, all containers of hazardous substances would be labeled and handled in accordance with the NDOT and NDEP regulations. The potential impacts to surface water quality from sedimentation would be minimized by the implementation of the environmental protection measures outlined in Section 2.1.12, including BMPs for road and drill pad construction and pump test water discharge. These BMPs would include the use of one or all of the following: fabric and/or weed-

free straw bale filter fences; siltation or filter berms; mud sumps; and downgradient drainage channels. Sediment traps would be constructed to ensure that drill cuttings are contained. Any residual impacts would be temporary, lasting only until exploration roads and drill pads are successfully reclaimed and revegetated.

4.1.8 Land Use Authorizations and Access

Land uses within and around the Project Area consist primarily of recreation, grazing, mineral exploration and mining. The Proposed Action would result in minor temporary changes to land use in the Project Area with regard to recreation and grazing that would last for the duration of the Project.

4.1.9 Paleontological Resources

Surface disturbing activities may cause direct impacts to paleontological resources through the damage or destruction of fossils, or loss of valuable scientific information by the disturbance of the stratigraphic context in which fossils are found. Indirect impacts may be created by increased accessibility to important paleontological resources leading to looting or vandalism. The potential for significant paleontological resources in the Project Area ranges from very low to high with the majority (84 percent) of the Project Area ranked as very low (PFYC 1). If any significant paleontological resources are found during operations, impacts would be mitigated through education of equipment operators, monitoring by geologists in critical areas, avoidance and/or data recovery (see Section 2.1.12). Generally, the Project proponent is responsible for the cost of implementing mitigation measures, including the cost of investigation, salvage, and curation of paleontological resources.

4.1.10 Public Safety

Public safety would be maintained throughout the life of the Project as described in the environmental protection measures (Section 2.1.12), which include that all equipment and other facilities would be maintained in a safe and orderly manner; all trenches, sumps, and other small excavations that pose a hazard or nuisance to the public, wildlife, or livestock would be adequately fenced to preclude inadvertent access to them; activities would be restricted to frozen or dry ground conditions where feasible; and in the event that any existing roads are severely damaged as a result of NMC activities, NMC would return them to their original condition.

NMC vehicles leaving the Project Area and turning on to the Jungo Road create a slight increase in the potential for vehicle collisions with approximately 20 to 40 trips per day. In addition, these added vehicles would create indirect public safety concerns due to the increased fugitive dust on the Jungo Road. There are no anticipated long-term impacts on public safety.

4.1.11 Rangeland Management

Potential impacts to rangeland improvements in the Project Area, including one corral and one windmill, could occur as a result of the Proposed Action. Disturbance as a result of the Proposed Action could impact approximately 500 acres of public lands in the Sand Dunes grazing allotment; however, due to the dispersed nature of the surface disturbance resulting from phased exploration activities (i.e., not all proposed sites would be disturbed at once) no impacts from the Proposed Action are expected on grazing animals.

4.1.12 Social Values and Economics

Approximately 50 individuals would be contracted or employed to conduct the exploration activities and could be in the Project Area at the same time for the life of the Project. The temporary contract personnel would utilize motel rooms and restaurants in the community of Winnemucca, Nevada; therefore, the socioeconomic impacts associated with the Project include, and would be limited to, Humboldt County. Such personnel would be temporary and should not create a demand for additional public or private services and would not impact public schools, the permanent housing market, or other services associated with permanent workers. These individuals would support local businesses and provide income to the community through the purchase of goods and services. In addition, the impacts to social values and economics from the Proposed Action would be short term (i.e., for the life of the Project).

4.1.13 Soils

The soil associations in the Project Area vary from severe to low for erosion hazard by water and erosion hazard by wind. Exploration activities associated with the Proposed Action on the soil series with a severe erosion hazard for wind and water would result in greater impacts from erosion compared to disturbance on the low hazard soils.

Total surface disturbance associated with the Proposed Action would impact up to 500 acres of soils and could occur in any of the soil series within the Project Area (Table 3.11-1). It is expected that the majority of the surface disturbance associated with the Project would occur on the Hawsley-Isolde and Blackhawk-Golconda-Orovada series since they occupy 16.1 and 12.4 percent, respectively, of the Project Area. The Hawsley-Isolde association has a low soil erosion hazard potential for water and a severe erosion hazard potential for wind. The Blackhawk-Golconda-Orovada association has a low erosion hazard potential for water and a moderate erosion hazard potential for wind. Impacts from erosion by water for both soil types would be minimal. Erosion by wind would result in a greater impact to soils.

The potential impacts to soils would be reduced by measures incorporated in the Project design including BMPs and the use of overland travel when practicable, concurrent reclamation of drill pads, sumps, trenches, and drill roads no longer needed for access. BMPs would include the use of one or all of the following: fabric and/or weed-free straw bale filter fences; siltation or filter berms; mud sumps; and downgradient drainage channels. Sediment traps would be constructed to ensure that drill cuttings are contained. Growth media (e.g., topsoil) would be salvaged and placed in a separate stockpile from the remainder of the excavated material. The growth media would be redistributed after the trench has been refilled to enhance revegetation and reduce the potential for erosion. Following successful reclamation, which would include regrading, ripping, and revegetation of disturbed areas, soil loss due to the Proposed Action would be temporary and minimal.

4.1.14 Special Status Species

4.1.14.1 Sensitive Species

Sensitive Plant Species

No sensitive plant species were located within the Project Area; therefore, no impacts to sensitive plants are expected from the Proposed Action.

Sensitive Wildlife Species

There are approximately 108,545 acres of potential Humboldt serican scarab habitat that has been identified in the dune complex. Approximately 5,656 acres of potential Humboldt serican scarab habitat have been identified in the Project Area or 5.2 percent of the total. The Humboldt serican scarab has not been seen since it was originally located and described in the Winnemucca dune complex in 1963 approximately 11.8 miles east of the Project Area boundary. If the Humboldt serican scarab is currently present in this location, potential habitat for this species is extensive and occurs throughout the complex. Disturbance to potential Humboldt serican scarab habitat within the Project Area could occur as a result of the Proposed Action and result in displacement and/or mortality of individuals present in the Project Area. If the Humboldt serican scarab is present in the Project Area, it is extremely likely that the population extends into the surrounding habitat. Project-related activities could impact a total of 500 acres, or 0.5 percent, of the Humboldt serican scarab habitat available in the Winnemucca dune complex. The Proposed Action may impact local individuals of the Humboldt serican scarab, if present.

Greater sage-grouse, a sensitive small game species, may have incidental use within the Project Area. Greater sage-grouse winter habitat occurs approximately 3.5 miles north of the Project Area. Greater sage-grouse droppings were identified in the Project Area in 1999. The area where the droppings were identified, burned in a wildland fire in 2006 and no evidence of greater sage-grouse was detected during the 2007 or 2008 surveys. Of the 17,451 acres of sagebrush/bunchgrass vegetation in the Project Area, two percent (or 415 acres) has been burned by wildfires. Although wildland fires had limited impacts to the total number of acres of sagebrush/bunchgrass vegetation available in the Project Area, wildland fires did impact the portion of the Project Area with recorded greater sage-grouse use; therefore, the quality, quantity, and distribution of previously occupied greater sage-grouse habitat are limited within the Project Area and the Proposed Action would have minimal impacts to greater sage-grouse.

Pallid bat, Townsend's big-eared bat, and western small-footed myotis occur within the Project Area. Project activities could occur 24 hours a day, seven days a week. Impacts to sensitive bat species could include noise disturbance, structural damage to hibernacula, disruption of hibernation, disruption of roosting, and reduced foraging area.

Disturbance to sensitive bat species would be minimized by the implementation of environmental protection measures outlined in Section 2.1.12 which would avoid impacts to bats during their hibernation. Bats are known to forage in the Project Area during the summer and Project-related disturbance could occur within the 600-foot buffer between April and September. As a result of the environmental protection measure disturbance within the 600-foot buffer in the summer is expected to have minimal impacts to sensitive bat species. Impacts to bats outside of the hibernation period would also be minimized since individuals are mobile in the summer and

would be expected to leave the immediate vicinity and roost in nearby habitat (i.e., additional nearby mine workings). Additionally, Project-related surface disturbance would be created incrementally and bats would be expected to move and forage in undisturbed areas. Impacts to foraging bats would be reduced with revegetation following Project completion.

With the implementation of the environmental protection measures (i.e., avoidance during hibernation or mitigation during non-hibernation), phased and incremental disturbance in the Project Area, and reclamation following Project activities, impacts to sensitive bat species in the Project Area would be minimized.

The environmental protection measures outlined in Section 2.1.12 would prevent direct impacts to sensitive bird species in the Project Area. Potential indirect impacts occur to sensitive bird species as a result of vegetation removal and activities associated with the Proposed Action. Sensitive bird species foraging in the Project Area during exploration activities would likely leave the immediate area, resulting in a temporary spatial redistribution of individuals or habitat-use patterns during the Project. Such redistribution would not have a long-term effect because undisturbed and suitable habitat exists around the Project Area. No long-term impacts are likely to occur because reclamation and reestablishment of vegetation would occur approximately three years after Project completion.

4.1.14.2 Species with Other Special Designations

Plant Species with Other Special Designations

Lahontan indigobush, a NNHP sensitive species, was located throughout suitable habitat in the northern portion of the Project Area. Suitable habitat consisted of the west-facing slopes of dunes ranging in slope from zero to 40 percent. Tens of thousands of plants were located in the Project Area. Suitable habitat for Lahontan indigobush extended north, east, and west of the northern portion of the Project Area.

Due to the small and dispersed nature of surface disturbance resulting from exploration activities (as well as the large numbers of existing populations and extent of suitable habitat), the Project would not result in a significant loss of individuals or populations of the Lahontan indigobush or their habitat and would not contribute to a loss of viability for the species; therefore, no mitigation is proposed.

Wildlife Species with Other Special Designations

Although minimal impacts are expected, wildlife species with other special designations(i.e., Great Basin collared lizard, desert horned lizard, kit fox) displaced by Project-related disturbance or habitat loss could be expected to relocate to additional habitat that is located adjacent to the Project Area and wildlife (i.e., Great Basin collared lizard, desert horned lizard, and kit fox) could be expected to move into nearby similar habitat during Project-related activities.

4.1.15 Vegetation

The Proposed Action would result in surface disturbance of approximately 500 acres of vegetation. The disturbance would be created incrementally and dispersed throughout the vegetation communities in the Project Area. Reclamation would begin as soon as practicable when exploration areas have been deemed inactive, without potential, or completed. Final reclamation would begin within two years of completion of exploration activities using a BLM approved seed mix. In addition, the disturbance would be mostly linear (roads) or patchy (drill pads) in form, and therefore highly likely to be recolonized by surrounding vegetation. The quality, quantity, and distribution of native vegetation within the Project Area is limited as a result of the wildfires that have occurred. Some natural revegetation in the burn areas would be expected from seeded species in areas that have not burned. Non burned areas have the potential for sagebrush and rabbitbrush to establish with sparse seeded species. There could be a long-term improvement of vegetation in the Project Area as surface disturbance is reclaimed and revegetated, and a greater abundance of native plant species becomes propagated if revegetation is especially successful. Livestock foraging and trailing to water sources could impact portions of the reclaimed areas, primarily linear features by making seeded species establishment difficult. Impacts to vegetation communities within the Project Area would likely be temporary.

4.1.16 Visual Resources

The Proposed Action would result in short-term visual impacts principally affecting the visual elements of line and color. Horizontal and shallow diagonal lines from drill roads would cause moderate, temporary line contrasts with the natural landscape. Disturbance of vegetation would cause moderate, temporary color contrasts. With successful reclamation of exploration roads and revegetation, long-term visual impacts would be minimized. The effects of the Proposed Action on visual resources would be consistent with BLM prescribed Class IV VRM objectives.

Drilling could occur 24 hours per day and could occur in any part of the Project Area. Drilling during the night would require the use of lights around each of the drill rigs. These lights are usually directional in nature to aid the drill crew to clearly see the equipment used to collect either core or reverse circulation samples. Up to ten drill rigs could be drilling during nighttime hours at any stage of the Project. Drilling activities at night would result in an isolated diffuse glow of light that could be seen from a distance. Depending on the location of the drilling in the Project Area, the distance could be from a few hundreds of feet to several miles. The effects would be temporary and last only as long as Project operations occurred at night.

4.1.17 Wildlife

Direct impacts to wildlife would consist of temporary habitat loss and disturbance from human activity and noise. Approximately 500 acres of existing wildlife habitat would be temporarily impacted by exploration activities over a five-year period, with the actual length of time based on exploration results, and reclamation following exploration including revegetation.

Although minimal impacts are expected, wildlife, especially individual small mammals, displaced by Project-related disturbance or habitat loss into already saturated habitats might perish; however, additional habitat is located adjacent to the Project Area and larger and more mobile wildlife could be expected to move into nearby similar habitat during Project activities. Construction of roads and drill pads and the operation of drilling equipment could disturb

wildlife due to the presence of humans and by creating noise and dust. Wildlife foraging activities within the Project Area could continue to be dispersed because up to ten drill rigs and their associated support equipment would be operating at one time within the 27,588-acre Project Area, allowing wildlife to move around and between Project activities. Concurrent reclamation and reestablishment of vegetation would take place in areas no longer needed for exploration and within two years of Project completion; therefore, no long-term impacts to wildlife habitat are likely to occur and the Proposed Action would have minimal direct impacts on wildlife species.

Indirect impacts to wildlife would occur as a result of short-term temporary loss of vegetation as a result of Project-related surface disturbance. The quality, quantity, and distribution of wildlife habitat within the Project Area is limited as a result of the wildfires that have occurred in the Project Area. Potential impacts to habitat would be minimized following reclamation and revegetation.

Big Game Species

Any disturbance to mule deer or pronghorn antelope would likely be limited to temporary auditory and/or visual perturbation of individuals in or near the Project Area. Individual mule deer or pronghorn antelope foraging in the Project Area during exploration activities would likely leave the immediate area, resulting in a temporary spatial redistribution of individuals or habitat-use patterns during the Project. Such redistribution would not have a long-term effect because undisturbed and suitable habitat exists around the Project Area.

Occupied year-round pronghorn antelope range occurs within the Project Area. The Project proposes to impact 500 acres and additional pronghorn antelope year-round range is available in the vicinity of the Project Area; therefore, no long-term impacts to pronghorn antelope year-round range are likely to occur and the Proposed Action would have minimal direct impacts on pronghorn antelope.

Indirect impacts to game species would occur as a result of the temporary loss of vegetation from Project-related surface disturbance. Impacts to wildlife habitat in the Project Area would be reduced as surface disturbance is reclaimed and revegetated and a greater amount of native plant species become available for game species foraging and shelter. Therefore, no long-term impacts to game species habitat are likely to occur and the Proposed Action would have minimal impacts on game species.

4.2 No Action Alternative

4.2.1 Air Quality

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. Air impacts from fugitive dust would be regulated by the SAD Operating Air Quality Permit #AP1041-2383. The impacts associated with the No Action Alternative would be similar to those described for the Proposed Action and would result in similar impacts but less than those associated with the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.2 Cultural Resources

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur. However, ongoing mineral exploration activities currently authorized or potentially occurring under the No Action Alternative would result in impacts similar to those associated with the Proposed Action.

4.2.3 Invasive, Nonnative Species

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. The No Action Alternative could include disturbance or redisturbance of 119.2 acres. The impacts associated with the No Action Alternative could result in impacts to 119.2 acres from establishment of invasive, nonnative species. Reclamation of surface disturbance, including reseeding, would gradually decrease potential impacts from invasive, nonnative species. Impacts to invasive, nonnative species as a result of the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.4 Migratory Birds

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. The No Action Alternative could result in the temporary loss of 119.2 acres of migratory bird nesting or foraging habitat. Reclamation of surface disturbance would gradually eliminate potential impacts to migratory birds. Impacts to migratory birds as a result of the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.5 Native American Religious Concerns

Under the No Action Alternative, there would be no impacts to Native American religious concerns.

4.2.6 Noise

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. The impacts from noise generated under the No Action Alternative would be similar to the Proposed Action; however, the impacts would not be as extensive due to the limited size (surface disturbance) of the alternative (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.7 Water Quality

Surface Water

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. Potential impacts to surface water quality as a result of this alternative would be similar to the Proposed Action and could include spills and sedimentation from surface disturbance from currently permitted surface disturbance and activities on private land that do not require a permit. Reclamation of surface disturbance would gradually eliminate sedimentation. Impacts to water quality as a result of the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.8 Land Use Authorizations and Access

The No Action Alternative would be similar to the Proposed Action and result in minor temporary changes to land use in the Project Area with regard to grazing. There are no anticipated long-term impacts on land use. Impacts to land use and access as a result of the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.9 Paleontological Resources

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. The No Action Alternative could result in 119.2 acres of surface disturbance, with impact similar to but less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.10 Public Safety

Impacts to public safety as a result of the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

NMC vehicles leaving the Project Area under the No Action Alternative and turning on to the Jungo Road would continue to create a slight increase in the potential for vehicle collisions with approximately five to 10 trips per day. In addition, these added vehicles would create indirect public safety concerns due to the increased fugitive dust on the Jungo Road. There are no anticipated long-term impacts on public safety.

4.2.11 Range Resources

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. The impacts to rangeland management under the No Action Alternative would be minimal due to the dispersed nature of the permitted surface disturbance and this impact is similar to but less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.12 Social Values and Economics

Under the No Action Alternative, there could be five to ten contract workers associated with the permitted Project which could potentially cause temporary minor impacts to the community of Winnemucca, Nevada. These impacts could include increased traffic and increased business for motels, restaurants, gas stations, and grocery stores. Impacts associated with the No Action Alternative would be similar, but proportionally less than the Proposed Action (i.e, five to ten people versus 50 people).

4.2.13 Soils

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. Under the No Action Alternative, the construction and maintenance of access roads and drill pads could impact 119.2 acres of soils. The exact location of all 119.2 acres of surface disturbance within the Project Area is unknown; therefore, the exact acres of surface disturbance that would occur under the No Action Alternative in each of the soil types in the Project Area cannot be calculated. However, the dominant soil types in the Project Area are Hawsley-Isolde, which has a low erosion hazard for water and a severe erosion hazard for wind, and the Golconda-Orovada association that has a low erosion hazard for water and a moderate erosion hazard for wind.

The potential for wind and water erosion of disturbed soils would be increased until reclamation was successfully completed. The potential impacts to soils would be reduced by measures incorporated in the Project design, including the use of waterbars and other BMPs, and the concurrent reclamation of drill pads, sumps, trenches, and drill roads no longer needed for access. BMPs would include the use of one or all of the following: fabric and/or weed-free straw bale filter fences; siltation or filter berms; mud sumps; and downgradient drainage channels. Sediment traps would be constructed to ensure that drill cuttings are contained. Impacts associated with the Proposed Action would not occur; however, authorized activities on public land and disturbance activities on private land up to 119.2 acres could occur (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.14 Special Status Species

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. Impacts to special status species habitat could be caused by surface disturbing activities on 119.2 acres of public and private land within the Project Area. Impacts to special status species habitat under the No Action Alternative would be similar to but less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.15 Vegetation

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. The No Action Alternative could include disturbance or redisturbance of 119.2 acres. Under the No Action Alternative, currently permitted surface disturbance and activities on private land that do not require a permit in the Project Area would continue to occur, which would result in the temporary loss of 119.2 acres of vegetation. Reclamation of surface disturbance including reseeding would minimize impacts to vegetation. Under the No Action Alternative, impacts to vegetation would be similar to, but less than, the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

4.2.16 Visual Resources

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. The No Action Alternative could include disturbance or redisturbance of 119.2 acres of public and private lands (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance). The impacts to visual resources would be similar in line, form, and texture to the Proposed Action and consistent with BLM prescribed Class IV VRM objectives under the No Action Alternative. These objectives are described in Section 3.14 in the Affected Environment Chapter of the EA. Impacts to visual resources, including lighting, under the No Action Alternative would be similar to but less than the Proposed Action.

4.2.17 Wildlife

Under the No Action Alternative, none of the impacts associated with the Proposed Action would occur; however, ongoing mineral exploration activities in the Project Area currently permitted through Notices and PFRs and activities on private land that do not require a permit (i.e., a permit is not required from the State of Nevada for activities disturbing less than five acres) could occur. The No Action Alternative could include disturbance or redisturbance of 119.2 acres, which could result in the temporary loss of 119.2 acres of wildlife habitat.

Reclamation of surface disturbance would gradually eliminate impacts to wildlife. Impacts to wildlife as a result of the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately 24 percent of the Proposed Action based on relative amounts of surface disturbance).

5 CUMULATIVE IMPACTS

A cumulative impact is defined under federal regulations as follows:

> "...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

As required under the NEPA and the regulations implementing NEPA, this chapter addresses those cumulative effects on the environmental resources in the Cumulative Effects Study Areas (CESAs) which could result from the implementation of the Proposed Action and No Action Alternative. The extent of the CESA would vary with each resource, based on the geographic or biologic limits of that resource. As a result, the list of projects considered under the cumulative analysis may vary according to the resource being considered. In addition, the length of time for cumulative effects analysis would vary according to the duration of impacts from the Proposed Action on the particular resource.

5.1 Assumptions for Analysis

Direct and indirect consequences of the Proposed Action were evaluated previously in Chapter 4 for the various environmental resources. Analyzed in this chapter are those resources from Chapter 4 that have the potential to be incrementally impacted by the Proposed Action within the identified CESAs. Based on the preceding analysis in Chapter 4, no cumulative impacts are expected for the following resources: cultural resources; Native American religious concerns; land use; paleontological resources; rangeland management; recreation; social and economic values; noise, lighting, and visual resources. Resources have been grouped where similar cumulative impacts are expected.

Description of CESA Boundaries

The geographical areas considered for the analysis of cumulative effects vary in size and shape to reflect each evaluated environmental resource and the potential area of impact (Table 5.1-1).

The Air Quality CESA (375,663 acres) is identified as the three Hydrologic Unit Code (HUC) 5 watersheds (Silver State Valley, Blue Mountain Canyon, and Rose Creek-Humboldt River) that overlap with the Project Area (Figure 5.1.1). The Air Quality CESA was developed to address potential cumulative impacts to air quality.

The Natural Resources CESA (214,379 acres) was developed to assess potential cumulative impacts to water quality, soils, vegetation, wildlife, invasive, nonnative species, migratory birds, and special status species. The southern and western boundaries of the Natural Resources CESA follow the Sand Dunes grazing allotment. The eastern boundary of the Natural Resources CESA follows the Silver State Valley Hydrologic Unit Code (HUC 5) (Figure 5.1.1).

The Traffic CESA (64,556 feet) includes the length of Jungo Road from Winnemucca through the Project Area and was developed to address potential cumulative impacts to public safety (Figure 5.1.1).

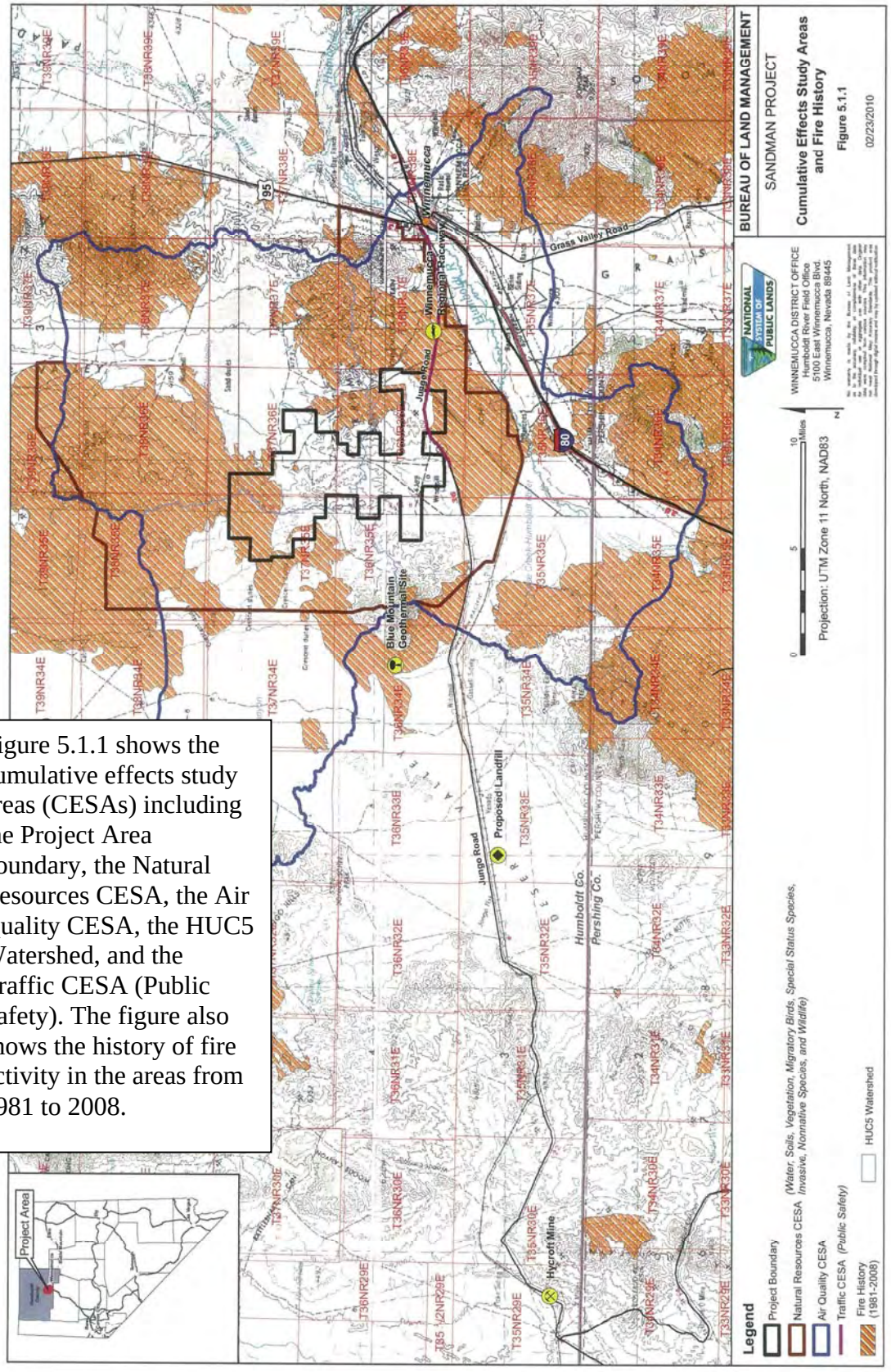


Figure 5.1.1 shows the cumulative effects study areas (CESAs) including the Project Area boundary, the Natural Resources CESA, the Air Quality CESA, the HUC5 Watershed, and the Traffic CESA (Public Safety). The figure also shows the history of fire activity in the areas from 1981 to 2008.

Table 5.1-1: Cumulative Effects Study Areas

Resource	Cumulative Effects Study Area	CESA Name	CESA Size
Air Quality	Silver State Valley, Blue Mountain Canyon, and Rose Creek-Humboldt River HUC 5 watersheds that overlap the Project Area.	Air Quality CESA	375,663 acres
Water Quality, Soils, Vegetation, Wildlife, Migratory Birds, Invasive, Nonnative Species, Special Status Species	The southern and western boundaries of the Natural Resources CESA follow the Sand Dunes grazing allotment. The eastern boundary of the Natural Resources CESA follows the Silver State Valley HUC 5 watershed.	Natural Resources CESA	214,379 acres
Public safety	Section of Jungo Road from Winnemucca to the Project Area.	Traffic CESA	64,556 feet

5.2 Past and Present Actions

Past and present actions in the Air Quality CESA include the following: exploration (approximately 68.3 acres of mineral exploration surface disturbance); livestock grazing; rangeland improvements; vegetation treatments; wildland fire; transportation networks (including railroads); ROWs; land sales and acquisitions; recreation (e.g., Winnemucca Regional Raceway); airport conveyance; and geothermal leases.

Past and present actions in the Natural Resources CESA include the following: exploration (approximately 31.9 acres of mineral exploration surface disturbance); livestock grazing; rangeland improvements; vegetation treatments; wildland fire; transportation networks (including railroads); ROWs; land sales and acquisitions; and recreation (e.g., Winnemucca Regional Raceway).

Past and present actions in the Traffic CESA include a transportation network.

Mineral Exploration and Mining

Previous mineral exploration for gold was initiated by Kennecott Minerals in 1987. Kennecott Minerals entered into a joint venture with Santa Fe Pacific Gold Corporation. Subsequently, Fronteer Development Group (formerly New West Gold, and Western States) conducted exploration at the Project. Disturbance included exploration drill holes and access roads.

Approximately 68.3 acres of surface disturbance associated with mineral exploration are located within the Air Quality CESA. Additionally, there are approximately 100 acres associated with four community material sites in the Air Quality CESA and approximately 225 acres of surface disturbance authorized for five projects associated with mineral commodities in the Air Quality CESA.

Approximately 31.9 acres of surface disturbance associated with mineral exploration are located within the Natural Resources CESA. Additionally, there are approximately 70 acres associated with three community material sites in the Natural Resources CESA and approximately 155 acres of surface disturbance authorized for four projects associated with mineral commodities in the Natural Resources CESA.

Livestock Grazing and Rangeland Improvements

Sixteen allotments are located in the Air Quality CESA, seven allotments are located in the Natural Resources CESA, and one allotment is located in the Traffic CESA. The allotments located in each of the CESAs are listed in Table 5.1-2.

Table 5.1-2: Allotments Located Within the CESAs

Grazing Allotment Name	CESA[1]		
	Air Quality	Natural Resources	Traffic
Bloody Run	X	X	
Blue Mountain	X	X	
Bottle Creek	X		
Daveytown	X	X	
Desert Valley	X		
Diamond S	X		
Dolly Hayden	X		
Harmony	X		
Humboldt Valley	X	X	
Jackson Mountains	X		
Melody	X		
Mormon Dan	X	X	
Sand Dunes	X	X	X
Sand Pass	X	X	
Thomas Creek	X		
White Horse	X		

[1]X indicates that the allotment is located within the identified CESA.

Table 5.1-3 includes the rangeland improvements located within the Air Quality and Natural Resources CESAs.

Table 5.1-3: Rangeland Improvements Located Within the CESAs

CESA	Rangeland Improvement Type
Air Quality	Corrals (9), developed springs (11), reservoir (1), troughs (4), wells (2), windmills (11), allotment fence (101.9 miles), exclosure (3.6 miles), fence (38.3 miles), pipeline (7.5 miles), private fence (39.9 miles), temporary fence (0.9 mile).
Natural Resources	Corrals (7), developed springs (6), reservoir (1), troughs (5), well (1), windmills (5), allotment fence (44.8 miles), fence (3.6 miles), pipeline (1.9 miles), private fence (28.6 miles), temporary fence (0.9 mile).
Traffic	n/a

Wildland Fires and Vegetation Treatments

Wildland fires burned approximately 148,490 acres within the Air Quality CESA, 108,355 acres within the Natural Resources CESA, and 21,763 acres within the Traffic CESA between 1985 and 2006 (Figure 5.1.1).

Vegetation treatments within the Air Quality CESA include the following: 13,203 acres of aerial seeding; 22,702 acres of drill seeding; 96 acres of heli-mulch; 85 acres of mowing; 5,289 acres of natural recovery; and three acres of Wyoming big sagebrush planting (Figure 5.1.2).

Vegetation treatments within the Natural Resources CESA include the following: 9,720 acres of aerial seeding; 19,899 acres of drill seeding; and 1,981 acres of natural recovery (Figure 5.1.2).

Transportation Networks

The approximate lengths of transportation networks in the various CESAs are listed below in Table 5.1-4.

Table 5.1-4: Transportation Networks in the CESAs

Transportation Network	CESAs		
	Air Quality	**Natural Resources**	**Traffic**
Jungo Road	19.7 miles	14.8 miles	12.2 miles
Grass Valley Road	6.8 miles	-	-
I-80	21.3 miles	-	-
Highway 95	1.8 miles	-	-
Railroads	22.5 miles	0.5 mile	-

ROWs

The following ROWs are located within the Air Quality CESA: 33 ROWs associated with power transmission lines totaling approximately 153 acres; five ROWs associated with water facilities totaling approximately one acre; one ROW associated with a water plant; 11 ROWs associated with communication sites totaling approximately 0.2 acre; ten ROWs associated with telephone lines totaling approximately 35 acres; 19 ROWs associated with roads totaling approximately 235 acres; seven ROWs associated with oil and gas pipelines totaling approximately 59 acres; one ROW associated with a gas pipeline totaling approximately one acre; one ROW associated with a power transmission facility; two ROWs associated with the railroad totaling approximately 56 acres; one easement ROW totaling approximately two acres; two ROWs associated with trail/firebreaks totaling approximately seven acres; and one ROW associated with a community pit totaling approximately 0.2 acre.

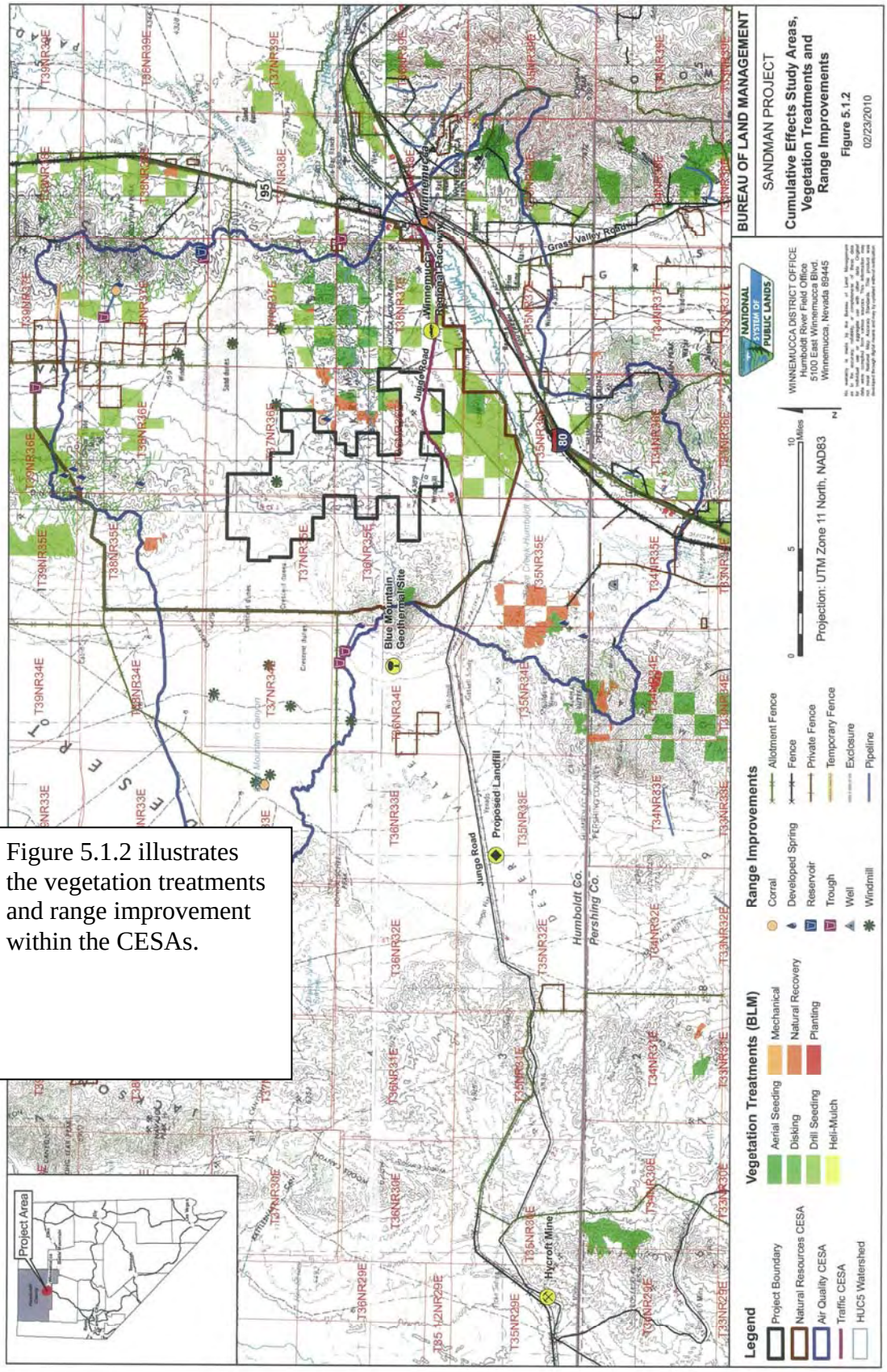


Figure 5.1.2 illustrates the vegetation treatments and range improvement within the CESAs.

The following ROWs are located within the Natural Resources CESA: 15 ROWs associated with power transmission lines totaling approximately 279 acres; two ROWs associated with water facilities; ten ROWs associated with communication sites totaling approximately 0.1 acre; six ROWs associated with telephone lines totaling approximately 66 acres; 13 ROWs associated with roads totaling approximately 393 acres; 11 ROWs associated with pipelines totaling approximately 104 acres; one ROW associated with a sewer and water pipeline totaling approximately two acres; one ROW associated with a community pit totaling approximately 0.2 acre; one ROW associated with a power transmission facility; five ROWs associated with railroads totaling approximately 406 acres; three ROWs associated with a substation totaling approximately four acres; two ROWs associated with easements totaling approximately 15 acres; and two ROWs associated with trail/firebreak totaling approximately six acres.

There are no ROWs located within the Traffic CESA.

Land Exchange, Acquisitions, and Land Sales

Ten land sales are located in the Air Quality CESA and five land sales are located in the Natural Resources CESA. Four land acquisitions are located in the Air Quality CESA and one land acquisition is located in the Natural Resources CESA.

Recreation

The Winnemucca Regional Raceway is located in all the CESAs. Dispersed recreation occurs throughout the CESAs; however, there are no data on the level of use.

Airport Conveyance

One airport conveyance is located in the Air Quality CESA totaling 857.5 acres.

Geothermal Leases

Two geothermal leases totaling 3,817 acres are located in the Air Quality CESA.

5.3 Reasonably Foreseeable Future Actions

Activities/events that would continue to occur in the Air Quality CESA include the following: livestock grazing; mineral exploration; material sites (including sites within the Project Area); vegetation treatments; wildland fire; transportation networks; and dispersed recreation.

Activities/events that would continue to occur in the Natural Resources CESA include the following: livestock grazing; mineral exploration; material sites (including sites within the Project Area); vegetation treatments; wildland fire; transportation networks; and dispersed recreation.

Activities/events that would continue to occur in the Traffic CESA include the following: transportation networks; dispersed recreation; and wildland fire.

Reasonably Foreseeable Future Actions (RFFAs) in the Air Quality CESA include the following: power transmission ROWs; two land exchanges; five land sales; one lease; and one other ROW.

RFFAs in the Natural Resources CESA include the following: two land sales; one ROW associated with a road; and four leases.

No RFFAs are known in the Traffic CESA.

Continuation of Past and Present Actions

Livestock grazing and road maintenance are expected to continue at their current levels. Recreation in the planning area is expected to increase an average of five percent per year (BLM 2005).

5.4 Cumulative Impacts for the Proposed Action

5.4.1 Air Quality

The CESA for air quality is the Air Quality CESA, which covers 375,663 acres.

Past and Present Actions: Present actions within the Air Quality CESA that are likely to be contributing to air quality impacts include wildland fire, dispersed recreation, minerals exploration, industrial operations (i.e., potato processing plant, limestone mill plant, concrete readymix plant), and transportation networks. These activities are principally contributing point source particulate matter emissions and fugitive dust to the air quality impacts; however, products of combustion are also emitted. Impacts from wildland fires would be of short duration and localized. Table 5.4-1 provides a summary of the emissions within the CESA. These emissions include those sources that have a permit from the Nevada BAPC and vehicle travel on Interstate-80, US Highway 95, Grass Valley Road, and Jungo Road. Other emissions occur within the city of Winnemucca and from railroad travel through the CESA; however, these emissions are not readily quantifiable.

Table 5.4-1: Air Quality Emissions within the Air Quality CESA

Emission Source	Emissions (tons per year)					
	PM_{10}	$PM_{2.5}$	NOx (oxides of nitrogen)	SO_2 (sulfur dioxide)	CO (carbon dioxide)	VOC (volatile organic compounds)
Permitted Sources	101.84	101.84	770.49	161.40	263.50	157.88
Vehicles	10.94	8.40	398.97	11.86	1,120.98	-
Totals	112.78	110.24	1,169.46	173.26	1,384.48	157.88

RFFAs: RFFAs within the Air Quality CESA that may contribute to impacts to air quality include dispersed recreation, mineral exploration, transportation, industrial operations, and wildland fires, which would likely be of a similar magnitude as the present actions within the CESA. These impacts result in impacts to air quality from the emissions of point source particulate matter, fugitive dust, and the products of combustion.

Cumulative Impacts: Cumulative impacts to air quality within the Air Quality CESA would result from the past and present actions and RFFAs when combined with the Proposed Action. The incremental contribution of the Proposed Action's particulate and combustion emissions and fugitive dust would be on the order of 0.9 percent for SO_2 and 2.8 percent for NOx. Stationary

sources would be regulated by the BAPC under individual permits to ensure that impacts would be reduced to levels that are consistent with the ambient air quality standards. The Dust Control Plan for the Project and speed limits are measures that would minimize the potential effects of fugitive dust on air quality. Reclamation of Project-related proposed surface disturbance would gradually eliminate fugitive dust from wind erosion.

5.4.2 Invasive, Nonnative Species

The CESA for invasive, nonnative species is the Natural Resources CESA, which covers 214,379 acres.

Past and Present Actions: Past and present actions with impacts created by invasive, nonnative species (noxious weeds) have included mineral exploration, material sites (including sites within the Project Area), livestock grazing, rangeland improvements, vegetation treatments, wildland fire, transportation networks, ROWs, land sales and acquisitions, dispersed recreation, airport conveyance, and geothermal leases. The BLM identifies six species of noxious weeds potentially occurring within the Project Area and immediate vicinity: hoary cress; perennial pepperweed; salt cedar; medusahead; bull thistle; and Scotch thistle. Noxious weed species were not detected in the Project Area during surveys. Weedy, invasive species generally occupy areas of previous disturbance.

RFFAs: Potential impacts from invasive, nonnative species as a result of federal land sales (resultant land development), ROWs and leases, livestock grazing, mineral exploration; material sites (including sites within the Project Area); vegetation treatments, transportation networks, dispersed recreation, or loss of vegetation associated with wildland fires could occur, and result in continued potential of invasive, nonnative species infestations.

Cumulative Impacts: Cumulatively, the past, present, and RFFAs in combination with the Proposed Action would result in potential impacts from invasive, nonnative species that would be limited to infestations following removal or disturbance of vegetation. Wildland fires have impacted a large portion of the Natural Resources CESA (Figure 5.1.1). The Proposed Action (500 acres) would impact 0.2 percent of the CESA (214,379 acres). The past and present actions and RFFAs would impact an undetermined percentage of the Natural Resources CESA that is not readily quantifiable. The potential impacts from the Proposed Action would be minimized due to the implementation of environmental protection measures outlined in Section 2.1.12 including the following BMPs: concurrent reclamation efforts; operator control; removal of invasive, nonnative species, and noxious weeds on reclaimed areas; washing of vehicles prior to entering the Project Area; and avoiding areas of invasive, nonnative species and noxious weeds during periods when the weeds could be spread by vehicles. As a result, a minimal incremental impact from invasive, nonnative species in the Natural Resources CESA is expected.

5.4.3 Migratory Birds, Special Status Species, Wildlife

The CESA for migratory birds, special status species, and general wildlife is the Natural Resources CESA, which covers 214,379 acres.

Past and Present Actions: Past and present actions that are likely to have impacts to the habitat for special status bat species, as well as migratory birds and other wildlife include mineral exploration, material sites (including sites within the Project Area), livestock grazing, vegetation treatments, transportation networks, ROWs, land sales and acquisitions, wildland fire, and dispersed recreation. These activities are likely to have impacts to migratory birds, special status species, and wildlife habitat, or result in direct impacts to individuals in travel routes. Approximately 108,355 acres within the Natural Resource CESA have been disturbed by wildland fires between 1985 and 2006, which is approximately 51 percent of the CESA.

Past and present minerals surface disturbance in the Natural Resources CESA totals approximately 31.9 acres (or approximately 0.02 percent of the CESA). There are no data on the number of acres reclaimed. State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed and some areas have become naturally stabilized, and/or naturally revegetated over time.

Within the Natural Resources CESA there are portions of seven allotments. Grazing has modified vegetation, and thus modified the migratory bird, special status species, and wildlife habitat throughout the CESA.

RFFAs: Potential impacts to migratory birds, special status species, and wildlife from exploration, livestock grazing, vegetation treatments, transportation networks, ROWs, dispersed recreation, or loss of habitat associated with potential wildland fires could occur. In addition, noise could affect migratory birds, special status species, and wildlife.

Grazing uses within the Natural Resources CESA would have varying effects on migratory birds, special status species, and wildlife habitats based on the grazing system in each allotment.

Cumulative Impacts: Impacts to migratory birds, special status species, and wildlife from the Project would be limited to removal of vegetation, alteration of habitat (500 acres), noise associated with exploration, and vehicular collisions. The Proposed Action (500 acres) would impact 0.2 percent of the CESA (214,379 acres). These impacts would be localized. Based on the above analysis and findings from Sections 4.1.4, 4.1.12, and 4.1.14 incremental impacts to migratory birds, special status species, and wildlife as a result of the Proposed Action when added to the past and present actions and RFFAs are expected to be minimal.

5.4.4 Water Quality

The CESA for water quality is the Natural Resources CESA, which covers 214,379 acres.

Past and Present Actions: Past actions that are likely to have impacted surface water would have included mineral exploration, material sites (including sites within the Project Area), livestock grazing, rangeland improvements, ROWs, land exchange, vegetation treatments, wildland fire, transportation networks, and dispersed recreation. Fire rehabilitation has been conducted on a large portion of the public lands and portions of the private land. A total of 31.9 acres of disturbance are approved for mineral activities in the Natural Resources CESA. Reclamation

would be required when this disturbance is completed, thereby limiting the amount of sedimentation generated by this disturbance.

RFFAs: Potential impacts to surface water quality could result from livestock grazing, vegetation treatments, wildland fire, mineral exploration; material sites (including sites within the Project Area); transportation networks, ROWs, and dispersed recreation. There are no specific data on the amount of sedimentation that could result from these activities. However, the mining activities would be required to have spill prevention plans, handle hazardous substances in accordance with NDOT and NDEP, adhere to NAC 534.4369 and 534.4371, and utilize BMPs, thus minimizing impacts to water quality. BMPs would include the use of one or all of the following: sediment traps or sumps; straw bales (certified weed-free); silt fences; the distribution of clarified water from sediment traps through perforated pipes in order to minimize erosion from channeling; and the use of common, centrally located sediment sumps.

Cumulative Impacts: The Proposed Action (500 acres) would impact 0.2 percent of the CESA (214,379 acres); however, BMPs would minimize those impacts. Surface disturbance would increase the potential for erosion and sedimentation in the surface water system. As a result, a minimal incremental impact to surface water quality in the Natural Resources CESA is expected.

5.4.5 Public Safety

The CESA for public safety is the Traffic CESA, which includes 64,556 feet of the Jungo Road from the intersection with US Highway 95 to the Project access road.

Past and Present Actions: The only present actions within the CESA are travel on the Jungo Road at an approximate rate of 1,482 trips per day, maintenance of the road, and livestock and wildlife crossing the open range portion of the road.

RFFAs: The Jungo Landfill, located west of the Project along Jungo Road, would commence operations and result in up to 50 trips per day on the Jungo Road. In addition, it is reasonable to expect that the RFFA would be a continuation of the same present actions with a slight increase on traffic volumes.

Cumulative Impacts: Cumulatively, the past, present, and RFFAs in combination with the Proposed Action would result in potential impacts to public safety due to vehicle collisions within the CESA. Vehicle traffic associated with the Proposed Action could include between 20 and 40 trips per day, which would likely increase the traffic volume thus increasing the collision potential by 1.4 to 2.4 percent within the CESA.

5.4.6 Soils

The CESA for soils is the Natural Resources CESA, which covers 214,379 acres.

Past and Present Actions: Past actions that could have impacted soils would have included mineral exploration, material sites (including sites within the Project Area), livestock grazing, rangeland improvements, ROWs, land sales and acquisitions, vegetation treatments, transportation networks, and dispersed recreation that disturbed or impacted soils, or that increased erosion or sedimentation. Wildland fires have affected soils but these conditions have been stabilized through fire rehabilitation and natural. There are no specific data that quantify soil loss in the Natural Resources CESA.

RFFAs: Potential impacts to soils from livestock grazing, mineral exploration; material sites (including sites within the Project Area); vegetation treatments, transportation networks, ROWs, dispersed recreation, land leases, or loss of vegetative cover associated with potential wildland fires could occur.

Cumulative Impacts: The Proposed Action (500 acres) would impact 0.2 percent of the CESA (214,379 acres). The potential impacts from the Proposed Action would be minimized due to the implementation of environmental protection measures outlined in Section 2.1.12 and concurrent reclamation. As a result, a minimal incremental impact to soils in the Natural Resources CESA is expected.

5.4.7 Vegetation

The CESA for vegetation is the Natural Resources CESA, which covers 214,379 acres.

Past and Present Actions: Past and present actions that could impact vegetation would include mineral exploration, material sites (including sites within the Project Area), livestock grazing, rangeland improvements, ROWs, transportation networks, land sales and acquisitions, and dispersed recreation that utilized, impacted or reduced vegetation. Changes in vegetation were associated with wildland fire and fire rehabilitation treatments.

RFFAs: Potential impacts from livestock grazing, vegetation treatments, transportation networks, ROWs, dispersed recreation, land leases, or loss of vegetation associated with wildland fires could occur.

Cumulative Impacts: The Proposed Action (500 acres) would impact 0.2 percent of the CESA (214,379 acres). The potential impacts to vegetation from the Proposed Action would be minimized due to concurrent reclamation. As a result, a minimal incremental impact to vegetation in the Natural Resources CESA is expected.

5.5 <u>Cumulative Impacts for the No Action Alternative</u>

5.5.1 Air Quality

Cumulative impacts to air resources within the CESA would result from the present and RFFAs when combined with this alternative; however, the incremental contribution of this alternative is less than the Proposed Action and would be relatively small. The cumulative emissions are generally dispersed and the stationary sources would be regulated by the BAPC to ensure that impacts would be reduced to levels that are consistent with the ambient air quality standards.

5.5.2 Invasive, Nonnative Species

Cumulatively, the past, present, and RFFAs would result in potential impacts from invasive, nonnative species that would be limited to infestations following removal of vegetation. These impacts would be localized. Therefore, impacts from invasive, nonnative species as a result of this alternative would be less than the Proposed Action and in combination with past and present actions and RFFAs would be minimized.

5.5.3 Migratory Birds, Special Status Species, Wildlife

Cumulatively, the past, present, and RFFAs would result in potential impacts to migratory birds, special status species, and wildlife and their habitat. These impacts would be localized and current projects would include revegetation in order to restore habitat. Due to the small impact within the Natural Resources CESA, the impacts to migratory birds, special status species, and wildlife or their habitat from this alternative in combination with past and present actions and RFFAs would be minimal.

5.5.4 Water Quality

Cumulatively, the past, present, and RFFAs would result in impacts to surface water resources. Due to the very limited impact within the CESA, the impacts to surface water quality from this alternative in combination with past and present actions and RFFAs would be minimal.

5.5.5 Public Safety

Cumulatively, the past, present, and RFFAs would result in potential impacts to public safety due to vehicle collisions within the CESA. Impacts to public safety as a result of this alternative would be less than the Proposed Action and in combination with past and present actions and RFFAs would be minimized.

5.5.6 Soils

Cumulatively, the past, present, and RFFAs would result in the displacement of soils and could result in increased erosion by wind and water. These impacts would be localized. Therefore, impacts to soils as a result of this alternative would be less than the Proposed Action and in combination with past and present actions and RFFAs would be minimized.

5.5.7 Vegetation

Cumulatively, the past, present, and RFFAs would result in removal of vegetation. These impacts would be localized; therefore, impacts to vegetation as a result of this alternative would be less than the Proposed Action and in combination with past and present actions and RFFAs would be minimized.

6 MITIGATION AND MONITORING

6.1 Proposed Action

No mitigation measures were recommended beyond those environmental measures committed to by NMC in Section 2.1.12, which are reiterated below as a reference.

NMC Environmental Protection Measures from Section 2.1.12

Water Quality

- All but ten drill holes would be surveyed and plugged as an operational procedure immediately after completion of drilling in accordance with NAC 534.421 and 534.425. The ten drill holes would be collared with a RC drill rig and completed using a core rig. Once the core rig has completed the drill hole, the hole would be plugged. Drill holes would be plugged by placing drill cuttings or cement grout, concrete grout, or neat cement plug into the total depth of the hole, or if ground water is encountered, plugged as a well pursuant to NAC 534.420.

- BMPs such as check dams (weed-free straw bales) would be used to slow and disseminate discharge water from pump tests to decrease erosion and sedimentation to surface waters.

- Drill cuttings would be contained on site and fluids managed utilizing appropriate control measures. Sediment traps would be used as necessary and filled at the end of the drill program.

- NMC would follow the Spill Prevention Plan included in the Plan.

- Only nontoxic fluids would be used in the drilling process.

Cultural and Paleontological Resources

- Pursuant to 43 CFR 10.4(g), NMC would notify the BLM authorized officer, by telephone, and with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR 10.2). Further, pursuant to 43 CFR 10.4 NMC would immediately stop all activities in the vicinity of the discovery and not commence again until a notice to proceed is issued by the BLM authorized officer.

- NMC would not knowingly disturb, alter, injure, or destroy any scientifically important paleontological deposits. In the event that previously undiscovered paleontological resources are discovered by NMC in the performance of any surface disturbing activities, the item(s) or condition(s) would be left intact and immediately brought to the attention of the authorized officer of the BLM. If significant paleontological resources are found, avoidance, recordation, and/or data recovery would be required.

- NMC would avoid, or mitigate impacts to, all eligible or the contributing element portions of cultural resources within the Project Area. As a rule all eligible or contributing elements of an eligible site would be avoided by a buffer zone of 100 feet. In cases of historic roads the non-contributing elements would continue to be utilized and the contributing elements would not be utilized for transportation. The contributing elements would continue to be avoided by the 100 feet buffer zone during all other activities. If eligible or the contributing elements to an eligible site could not be avoided the site would be mitigated through a data recovery plan approved by the BLM in consultation with the SHPO. The BLM would provide a review of the work plan for each phase prior to NMC initiating activities under that phase to ensure the protection of all contributing elements of or eligible cultural resources. Any cultural resource discovered by NMC, or any person working on their behalf, during the course of activities on federal land would be immediately reported to the authorized officer by telephone, with written confirmation. The permit holder would suspend all operations in the immediate area of such discovery and protect it until an evaluation of the discovery can be made by the authorized officer. This evaluation will determine the significance of the discovery and what mitigation measures are necessary to allow activities to proceed. NMC would be responsible for the cost of evaluation and mitigation. Operations would resume only upon written authorization to proceed from the authorized officer.

- NMC would provide a fact sheet and field orientation to heavy equipment operators and drilling crews. The fact sheet would include information on fossils that could be found during surface disturbing activities in the Project area and the procedure to follow if fossils were found.

- NMC would have a geologist on site during surface disturbing activities in the following buffered areas where the Lake Lahontan highstand (elevation 4,360) is mapped in the Project Area: T37N, R36E sections or portions of sections 19, 20, 22, 27, 28, 29, 32, 33, T36N, R36E sections or portions of sections 26, 19, 20, 29, and 30, and a portion of T37N, R35E, section 15.

Migratory Birds

- Land clearing or other surface disturbance associated with the Proposed Action would be conducted outside of the avian breeding season, whenever feasible, to avoid potential destruction of active bird nests or young birds in the area. When surface disturbance must be created during the avian breeding season (April 15 through July 15), a qualified biologist would survey the area prior to land clearing activities. If active nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nest material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) would be delineated and the entire buffer area avoided to prevent destruction or disturbance to nests until they are no longer active. The start and end dates of the seasonal restriction may be based on site-specific information, such as elevation and winter weather patterns, which affect breeding chronology.

Wildlife

- All construction activities within 600 feet of the openings of underground workings known to be habitat to sensitive bat species would be avoided during the winter hibernaculum (the months of October through March).

- If construction activities occur closer than 600 feet of the openings of underground workings, outside of the hibernation period (between the months of April and September), NMC would consult with the BLM and a qualified expert in the field of bat conservation and biology to develop appropriate mitigation.

- All trenches, sumps, and other small excavations that pose a hazard or nuisance to the public, wildlife, or livestock would be adequately fenced to preclude access or constructed with a sloped end for easy egress.

Public Safety and Access

- Public safety would be maintained throughout the life of the Project. All equipment and other facilities would be maintained in a safe and orderly manner.

- NMC would contact the appropriate agency prior to surface disturbance or drilling in any underground ROW.

- Drill sites, sumps, and trenches would be reclaimed as soon as practicable after completion of sampling and logging.

- Activities would be restricted to frozen or dry ground conditions where feasible. Operations would be curtailed when saturated or soft soil conditions exist.

- Any survey monuments, witness corners, or reference monuments would be protected and avoided.

- Pursuant to 43 CFR 8365.1-1(b)(3) and 43 CFR 3809.420(b)(5) and (6), no sewage, petroleum products, or refuse would be dumped from any trailer or vehicle.

- All regulated wastes would be removed from the Project Area and disposed of in a state, federal, or local designated area.

- All applicable state and federal fire laws and regulations would be complied with and all reasonable measures would be taken to prevent and suppress fires in the Project Area.

- Final reclamation of overland travel routes, sumps, and drill sites would consist of, if required, fully recontouring disturbances to their original grade, and reseeding in the fall season immediately following completion of exploration activities.

- In the event that any existing roads are severely damaged as a result of NMC activities, NMC would return the roads to their original condition.

Vegetation

- Reseeding would be consistent with all BLM recommendations for seed mix constituents, application rate, and seeding methods.

Air Quality

- Emissions of fugitive dust from disturbed surfaces would be minimized by the application of water from a water truck as a method of dust control.

Noxious Weeds

- Noxious weeds would be controlled through implementation of preventative BMPs and eradication measures if noxious weeds were found.

6.2 No Action Alternative

There are no mitigation measures or monitoring recommended as part of the No Action Alternative.

7 LIST OF PREPARERS

Bureau of Land Management

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8 CONSULTATION AND COORDINATION

Tribal Consultation

On October 5, 2009, letters providing information relating to the Proposed Action were sent to the Winnemucca Indian Colony and the Summit Lake Paiute Tribe and on October 16, 2009, letters providing information relating to the Proposed Action were sent to the Fort McDermitt Paiute & Shoshone Tribe and the Lovelock Paiute Tribe. Additionally, follow-up phone calls were conducted to identify if the Tribes had any concerns about the Proposed Action, effects it may have on TCP or sacred sites, or if the Tribe would like to have formal government to government consultation relating to the proposed action.

On October 15, 2009, an e-mail was received from Ron Johnny, of the Summit Lake Paiute Tribe, expressing that the Tribal Council was concerned with the Project relating to whether artifacts had been collected during the cultural resource inventories, protection of resources, pollution, and if tribal monitors would be utilized during the proposed activities. On November 12, 2009, Ron Johnny and Rachael Brown of the Summit Lake Paiute Tribe and Samuel Potter of the BLM visited the Project Area for a tour and to answer questions about the proposed Project.

9 PUBLIC INVOLVEMENT

A scoping letter was posted on the BLM's website and sent to potentially interested parties by the BLM on August, 13, 2009, and five responses were received. The reader should refer to Section 1.5 regarding internal and external scoping.

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