

# FINAL ENVIRONMENTAL IMPACT STATEMENT

DOI-BLM-NV-W030-2011-0001-EIS

## Hycroft Mine Expansion Project



**July 2012**

U.S. Bureau of Land Management  
Winnemucca District Office  
Black Rock Field 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.

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**HYCROFT MINE EXPANSION PROJECT  
FINAL ENVIRONMENTAL IMPACT STATEMENT**

**JULY 2012**

<b>Lead Agency:</b>	U.S. Department of the Interior Bureau of Land Management Winnemucca District Office Black Rock Field Office
<b>Cooperating Agencies:</b>	U.S. Environmental Protection Agency Nevada Department of Wildlife
<b>Project Location:</b>	55 Miles West of Winnemucca, Nevada Humboldt and Pershing Counties
<b>EIS Number:</b> <b>Plan of Operations Number:</b>	DOI-BLM-NV-W030-2011-0001-EIS NVN-064641
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**ABSTRACT**

The Hycroft Mine is located on public land administered by the Bureau of Land Management and on private land controlled by Hycroft Resources and Development, Inc. The 20-year project, **including a 12-year extension of the mine life**, is an expansion of the existing mining and processing operation. This document describes the existing operation and how it would be modified and expanded by the Proposed Action. It also discusses the existing environment and the potential environmental consequences of the Proposed Action and the No Action Alternative to the existing environment. Suggested mitigation and monitoring measures are also outlined in this document. The surface disturbance associated with the proposed activities totals approximately 2,172 acres on both public and private lands. This is in addition to the current authorized surface disturbance of approximately 3,063 acres.

**Responsible Official for the EIS:**

  
**Gene Seidlitz**  
**District Manager**  
**Winnemucca District**

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**HYCROFT MINE EXPANSION PROJECT  
FINAL ENVIRONMENTAL IMPACT STATEMENT**

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**APPENDICES**

**Appendix A: Comment Letters on the Draft Environmental Impact Statement with Substantive Comments**

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## ABBREVIATIONS AND ACRONYMS

*Reader Note: Refer to the list below for abbreviations or acronyms that may be used in this document.*

<	less than
≤	less than or equal to
>	greater than
°	Degrees
µg/m <sup>3</sup>	micrograms per cubic meters
AADT	annual average daily traffic
AAQS	Ambient Air Quality Standards
ABA	acid base accounting
ACE	U.S. Army Corps of Engineers
ACHP	Advisory Council on Historic Preservation
ADT	average daily traffic
afa	acre feet annually
AHPA	Archaeological and Historic Preservation Act of 1974
AIRFA	American Indian Religious Freedom Act of 1978
AML	Appropriate Management Levels
amsl	above mean sea level
ANFO	ammonium nitrate/fuel oil mixture
ANSI	American National Standards Institute
AP	Advanced Placement
APE	Area of Potential Effect
AQMA	Air Quality Management Area
ARD	acid rock drainage
ARPA	Archaeological Resource Protection Act of 1979
ASW	Applied Soil and Water Technologies
AUM	animal unit month
B&K	Bruel & Kjaer (microphones)
BAPC	Bureau of Air Pollution Control
BAQP	Bureau of Air Quality Planning
BATF	Bureau of Alcohol, Tobacco, Firearms, and Explosive
BBA	Brown Buntin Associates, Inc.
BCR	Bird Conservation Region
BEA	Bureau of Economic Analysis
bgs	below ground surface
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMPs	Best Management Practices
BMRR	Bureau of Mining Regulation and Reclamation
BRFO	Black Rock Field Office
BSA	Barkdull Spencer Agency
C	Celsius
CAB	Community Advisory Boards
CEQ	Council on Environmental Quality

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CERCLA -	Comprehensive Environmental Response, Compensation, and Liability Act
CESA -	cumulative effects study area
CFR -	Code of Federal Regulations
cm/sec -	centimeters per second
CNEL -	Community Noise Equivalent Level
CO -	carbon monoxide
CO <sub>2</sub> (e) -	carbon dioxide equivalent
dB -	Decibels
dBA -	decibel with A weighting filter
DE -	diatomaceous earth
DETR -	Department of Employment, Training, and Rehabilitation
DMV -	Department of Motor Vehicles
DOI -	Department of the Interior
EIS -	Environmental Impact Statement
EMS -	Emergency Medical Services
ENM -	Environmental Noise Model
EO -	Executive Order
EPA -	U.S. Environmental Protection Agency
EPCRA -	Emergency Planning and Community Right-To-Know Act
ESA -	Endangered Species Act
ET -	Evapotranspiration
F -	Fahrenheit
FCAA -	Federal Clean Air Act
FCWA -	Federal Clean Water Act
FHWA -	Federal Highway Administration
FICON -	Federal Interagency Committee on Noise
FLPMA -	Federal Land Policy and Management Act
FMCSA -	Federal Motor Carrier Safety Administration
ft/day -	feet per day
FTA -	Federal Transit Administration
GBBO -	Great Basin Bird Observatory
GED -	General Educational Development
GHG -	greenhouse gas
GID -	General Improvement District
GIS -	Geographic Information System
gpd -	gallons per day
gpm -	gallons per minute
gpm/ft <sup>2</sup> -	gallons per minute per square foot
GPS -	global positioning system
H:V	horizontal to vertical
H <sub>2</sub> S	hydrogen sulfide
HAP	Hazardous Air Pollutants
HCRMP	Humboldt County Regional Master Plan
HCSD	Humboldt County School District
HCSO	Humboldt County Sheriff's Office

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HCT	humidity cell test
HDA	Humboldt Development Authority
HDPE	high density polyethylene
HGH	Humboldt General Hospital
HMA	Herd Management Areas
HRDI	Hycroft Resources and Development, Inc.
HSWA	Hazardous and Solid Waste Amendments
Hz	Hertz
I-80	Interstate 80
ICC	International Code Council
ICP	induced coupled plasma
ID	Interdisciplinary
IM	Instruction Memorandum
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change
KMG	Kamma Mountains Group
KOP	key observation point
Ktons	Kilotons
kV	Kilovolt
KVA	kilovolt amperes
L <sub>50</sub>	noise level median
LCRS	leak collection recovery system
L <sub>dn</sub>	noise levels day/night
L <sub>eq</sub>	noise level average
LFD	Lovelock Fire Department
L <sub>max</sub>	noise level maximum
LMWD	Lovelock Meadows Water District
LPD	Lovelock Police Department
LR2000	Land and Mineral Legacy Rehost System
LRL	Lockwood Regional Landfill
LTT	long-term trust
MBTA	Migratory Bird Treaty Act
MDB&M	Mount Diablo Base & Meridian
MFP	Management Framework Plan
mg/L	milligrams per liter
mg/m <sup>3</sup>	milligrams per cubic meter
Mgal	million gallons
Mgd	million gallons per day
MMPA	Materials and Minerals Policy Act
MOU	Memorandum of Understanding
mph	miles per hour
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
mW/m <sup>2</sup>	milliwatt per square meter
MWMP	Meteoric Water Mobility Procedure
NAAQS	National Ambient Air Quality Standards

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NAC	Nevada Administrative Code
NAD83	North American Datum 1983
NAG	net acid generation
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NAIP	National Agricultural Imagery Program
NCA	National Conservation Area
NDE	Nevada Department of Education
NDEP	Nevada Division of Environmental Protection
NDOA	Nevada Department of Agriculture
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDSP	Nevada Division of State Parks
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NESHAP	National Emission Standard for Hazardous Air Pollutants
NHPA	National Historic Preservation Act of 1966
NHPD	Nevada Highway Patrol Division
NNHP	Nevada Natural Heritage Program
NNPS	Nevada Native Plant Society
NO <sub>2</sub>	nitrogen dioxide
NOI	Notice of Intent
Non-PAG	non-potentially acid generating
NO <sub>x</sub>	oxides of nitrogen
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NSAAQS	Nevada State Ambient Air Quality Standards
NSHD	Nevada State Health Division
NSO	BLM Nevada State Office
NSPL	National System of Public Lands
NSPS	New Source Performance Standards
NVAAQS	Nevada Ambient Air Quality Standards
NVCRIS	Nevada Cultural Resources Information System
NV DOT	Nevada Department of Transportation
NVHC	Nevada Health Centers, Inc.
NWIS	National Water Information System
NWS	National Weather Service
O <sub>3</sub>	Ozone
OLSG	Old Lang Syne Group
opt	ounces per ton
OSHA	Occupational Safety and Health Administration
PASS	Personal Achievement School Success
PAG	potential acid generating
Pb	Lead
PCMP	Pershing County Master Plan
PCPI	per capital personal income

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PCRI	properties of cultural or religious importance
PCS	petroleum contaminated soils
PCSD	Pershing County School District
PCSO	Pershing County Sheriff's Office
PHREEQC	PH-REdox-EQuilibrium-Chemistry
Plan	Plan of Operations
PLS	pure live seed
PM <sub>10</sub>	particulate matter with aerodynamic diameter less than 10 microns
PM <sub>2.5</sub>	particulate matter with aerodynamic diameter less than 2.5 microns
PMU	population management unit
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PRIA	Public Rangelands Improvement Act of 1978
Project	Hycroft Mine Expansion Project
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
PVC	polyvinyl chloride
RCE	reclamation cost estimate
RCRA	Resource Conservation and Recovery Act
REMSA	Regional Emergency Medical Services Authority
RFFAs	reasonably foreseeable future actions
RFRA	Religious Freedom Restoration Act
RMIS	Recreation Management Information System
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
RPC	Regional Planning Commission
RV	recreational vehicle
SARA	Superfund Amendments and Reauthorization Act
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SEA	Safe Explosives Act
SEM	scanning electron microscopy
SG	Sulphur Group
SHPO	State Historic Preservation Office
SLAMS	state and local air monitoring site
SO <sub>2</sub>	sulfur dioxide
SR	State Route
SRA	State Recreation Area
SWPPP	Storm Water Pollution Prevention Plan
TCP	traditional cultural property
TDS	total dissolved solids
Title V	Federal Operating Permit Program
tpd	tons per day
tpy	tons per year
TRI	Toxics Release Inventory

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# EXECUTIVE SUMMARY

## Purpose of this Document

The Black Rock Field Office (BRFO) of the United States Department of the Interior, Bureau of Land Management (BLM) received a revised Plan of Operations (the Hycroft Mine Expansion Project [Project]) from Hycroft Resources and Development, Inc. (HRDI) in April 2010 (NVN-064641) (Plan). The Project includes the expansion of HRDI's existing precious metal mining operation and Project boundary (Proposed Action). The Project is located on public land administered by the BLM and private land controlled by HRDI in Humboldt and Pershing Counties, Nevada, approximately 55 miles west of Winnemucca, Nevada.

This Environmental Impact Statement (EIS) discloses HRDI's Proposed Action, the No Action Alternative, and environmental consequences that could result from implementation of these actions. Potential direct, indirect, and cumulative effects on the environment are analyzed in this EIS. Impacts described in this EIS would form the basis for a BLM decision regarding the Proposed Action, the No Action Alternative, and the selection of appropriate mitigation measures.

## Description of the Proposed Action

Under the Proposed Action, HRDI proposes expanded mining and mineral exploration activities on public lands at the existing Hycroft Mine, which would expand the Project boundary and create additional surface disturbance. The expansion would include approximately 2,172 acres of new surface disturbance on private and public land, for a total Project surface disturbance of 5,235 acres. The expansion would expand the existing Project boundary, which encompasses approximately 8,858 acres, by an additional 5,895 acres to bring the total Project area to 14,753 acres of public and private land. The Hycroft Mine currently employs approximately 200 workers. The Proposed Action is a **20-year Project, including a 12-year extension of the mine life, and would** increase employment to 537 mine personnel. The actions associated with the Proposed Action would consist of the following:

- Expand the Plan boundary;
- Incorporate all or portions of five HRDI Rights-of-Way (ROWs) into the Plan and continue to use the ROWs outside of the Plan boundary associated with the Project;
- Conduct additional exploration activities throughout the Project Area;
- Expand the existing Brimstone, **North**, Boneyard **open pits and the Central pit complex**;
- Backfill all or portions of the **Center (formerly the Central pit complex)**, Boneyard, Bay Area (**formerly North**), and Brimstone open pits;
- Construct a dispatch center near the expanded Brimstone open pit;
- Expand haul and secondary roads around the open pits, waste rock facilities (WRFs), and heap leach facilities;
- Construct two ready line and heavy equipment fueling areas and expand the existing ready line and fueling area;
- Expand the existing WRFs;
- Construct, operate, and reclaim the South WRF and associated haul roads;
- Operate a portable crusher with conveyors at the South heap leach facility;

- Construct, operate, and close the North Brimstone heap leach facility and associated process ponds and Merrill Crowe process plant;
- Construct, operate, and close the South heap leach facility, Merrill-Crowe process plant, and solution ponds;
- Relocate a segment of the Seven Troughs Road to bypass the South heap leach facility;
- Expand the existing refinery;
- Expand the existing Brimstone Merrill-Crowe process plant;
- Construct storm water diversions, install culverts, and other storm water controls;
- Close the existing Class III-waivered landfill and construct a new Class III-waivered landfill on private land;
- Relocate one potable water well and construct one process well;
- Relocate the existing Brimstone substation, upgrade the existing Crofoot substation, and extend powerlines to new process areas;
- Expand maintenance facilities;
- Construct growth media stockpiles; and
- Reclaim the Project consistent with the proposed Reclamation Plan.

### **Project Alternatives**

The only alternative analyzed in detail in this EIS, other than the Proposed Action, is the No Action Alternative. To date, no issues have arisen that would result in the formulation of an additional alternative(s). Three other alternatives were considered but eliminated from detailed analysis and are discussed in Section 2.2.2.

### **No Action Alternative**

Under the No Action Alternative, HRDI would not be authorized to develop the Project and expand the Hycroft Mine operations as currently defined under the Proposed Action. However, HRDI would be able to continue mining activities as outlined in previously approved plans of operation. Refer to Section 1.9.2 for a discussion of the existing mining activities. In addition, further mineral development on private land could occur even if the BLM selected the No Action Alternative. The public land area would remain available for future mineral development or for other purposes as approved by the BLM. Any additional activities proposed on public lands within the area would be analyzed under their own site-specific National Environmental Policy Act (NEPA) analysis at the time they are proposed.

### **Issues**

As a result of the public and internal scoping process, the following issues of concern were identified:

- What are the expected point source and fugitive emissions from the Proposed Action including particulate matter and greenhouse gases (GHGs)?
- What are the mercury emissions from the proposed Project?
- What are the effects to cultural resource sites?
- What is the effect of the Project on adjacent mineral resources?

- What are the noise effects to the National Conservation Area (NCA), the nearby private residence, the wilderness area, and the historic trail?
- What are the effects on the population of Crosby's buckwheat?
- What are the effects on the availability of golden eagle nesting habitat?
- How would special status bat species be impacted by the Proposed Action?
- How would increased traffic on Jungo Road affect public safety (i.e., collision with cows or reduced visibility from increased dust?)
- What effect does the Project have on the viewshed?
- What effect does the Project have on the night skies?
- What would be the cumulative impacts from the Project?

### **Summary of Potential Impacts**

A summary of the direct and indirect effects, as well as recommended mitigation measures, and the effectiveness of the mitigation for the Proposed Action and No Action Alternative are outlined in Table 2.3-1.

### **BLM Preferred Alternative**

Section 9.2.7.3 of the BLM NEPA Handbook directs that an EIS "...identify the agency's preferred alternative...For external proposals or applications, the proposed action may not turn out to be the BLM preferred alternative because the BLM would often present an alternative that would incorporate specific terms and conditions on the applicant."

Thus, the BLM has selected a Preferred Alternative based on the analysis in this EIS. This Preferred Alternative is the alternative that best fulfills the agency's statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. The BLM has determined that the Preferred Alternative is the Proposed Action as outlined in Chapter 2 of the EIS, with the inclusion of the identified mitigation measures to the Proposed Action as specified in Chapter 3 of the EIS.

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# 1 INTRODUCTION

## 1.1 Introduction

HRDI submitted the Plan to expand their existing precious metal mining operation at the Hycroft Mine site located in Humboldt County, Nevada. This expansion would then encompass lands in Pershing County. The existing and proposed operations are located on the National System of Public Lands (NSPL) and on private lands controlled by HRDI. These public lands are administered by the BLM, BRFO in the Winnemucca District. The Project is located in Township 34 North, Range 29 East (T34N, R29E) in all or portions of sections 1-4, 9-12, and 14; T35N, R29E, in all or portions of sections 13-14, 22-27, and 33-36; and T35N, R30E in all or portions of sections 16-21, and 28-32, Mount Diablo Base & Meridian (MDB&M) (Project Area). HRDI controls the mineral rights on the public lands within the Project Area under lode mining claims. Figure 1.1.1 shows the location of the Project Area and access to the site. The Project Area can be accessed by four routes:

- Jungo Road from Winnemucca;
- Interstate 80 (I-80) to State Route (SR) 447 between Empire and Gerlach to Jungo Road;
- Seven Troughs Road from Lovelock; and
- Imlay Cutoff from Imlay or Rye Patch Reservoir.

The existing Project boundary encompasses approximately 8,858 acres of both public and private land. The proposed expansion of the Project Area boundary includes approximately an additional 5,895 acres of public land, which would result in a total Project Area of approximately 14,753 acres. The Project Area would be located on approximately 12,946 acres of public lands, and approximately 1,807 acres of private land. Figure 1.1.2 shows the land status and boundary of the Project Area.

The specifics of the Proposed Action are outlined in the amended Plan (NVN-064641) submitted to the BLM in April 2010 (HRDI 2010a) and revised in September 2010. The Plan is available at the BLM BRFO in Winnemucca, Nevada, during normal business hours (Monday – Friday, 7:30 am to 4:30 pm). The proposed expansion would extend the life of the Project for approximately 20 years (through 2033), assuming a Project start date in 2013 and depending on market conditions. Mining would occur for approximately 12 years, followed by ore processing for approximately three years after mining operations ceased. Reclamation and site closure activities would occur for approximately five years following each mining and processing facility closure.

The proposed mining activities, which would be located primarily on public lands, are subject to BLM review and approval pursuant to the Federal Land Policy and Management Act (FLPMA) and surface management regulations at 43 Code of Federal Regulations (CFR), Subpart 3809. The BLM has determined that review and approval of the proposed Plan is a major federal action and that an EIS must be prepared to fulfill the BLM's NEPA. The EIS also analyzes potential impacts from proposed activities on private lands within the Project Area boundary. As the Lead Agency with respect to compliance with the NEPA and its implementing regulations, the BLM is preparing this EIS and will make a decision on the proposed expansion on public land.

The EIS is prepared in compliance with the NEPA and in accordance with the *BLM National Environmental Policy Act Handbook H-1790-I* (BLM 2008a), BLM Nevada State Office (NSO) Instruction Memorandum (IM) NV-90-435, and Council on Environmental Quality (CEQ)

regulations (40 CFR 1500) and guidance on the analysis of cumulative impacts. This EIS discloses the potential impacts on the human environment associated with implementation of the Proposed Action.

All of the georeferenced data presented in the figures and tables in this EIS are based on the Universal Transverse Mercator (UTM) coordinate system, Zone 11 North, and North American Datum 1983 (NAD83).

## **1.2 Organization of Document**

This document has been divided into several chapters to organize information for decision-making and ease of reading.

Chapter 1, Introduction, includes the following elements:

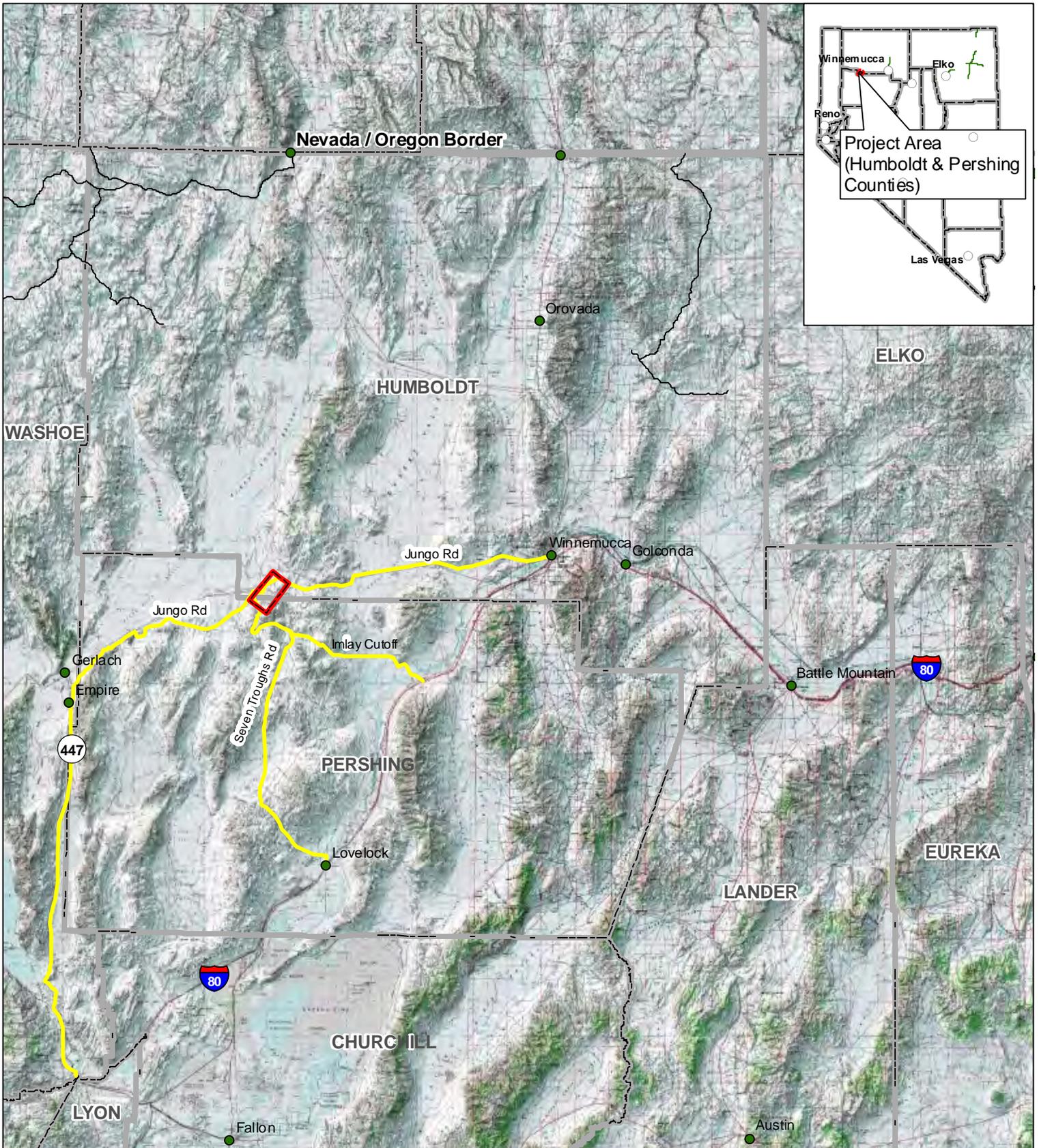
- Introduction (including Project location);
- Organization of the Document;
- Purpose of and Need for Action;
- Land Use Plan Conformance;
- Relationship to BLM and non-BLM plans, policies, and programs;
- Issues (resulting from both the internal and public scoping meetings); and
- Mine History and Existing and Approved Facilities.

Chapter 2, Description of Proposed Action and Alternatives, includes the following elements:

- Proposed Action (including activities and facilities associated with the Proposed Action, reclamation, and Environmental Protection Measures);
- Alternatives considered but eliminated from detailed analysis;
- The BLM Preferred Alternative; and
- A summary of effects by alternative.

Chapter 3, Affected Environment and Environmental Consequences, includes the following elements:

- Introduction (includes an environmental setting overview for the Project Area);
- Affected Environment (for each resource, which includes a description of the assessment area and regulatory framework);
- Environmental Consequences (for each resource, which includes the description of the assessment methodology, indicators of impacts, applicant committed environmental protection measures and design features, direct and indirect impacts, recommended mitigation and monitoring [as necessary], and residual impacts);
- The Relationship Between Short- and Long-term Uses of Man's Environment and Maintenance and Enhancement of Long-term Productivity; and
- Irreversible and Irretrievable Commitment of Resources.



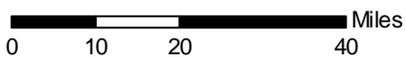
Projection: UTM Zone 11 North, NAD83

**Explanation**

- Proposed Project Area Boundary
- Roads
- Access Roads
- 447 State Route



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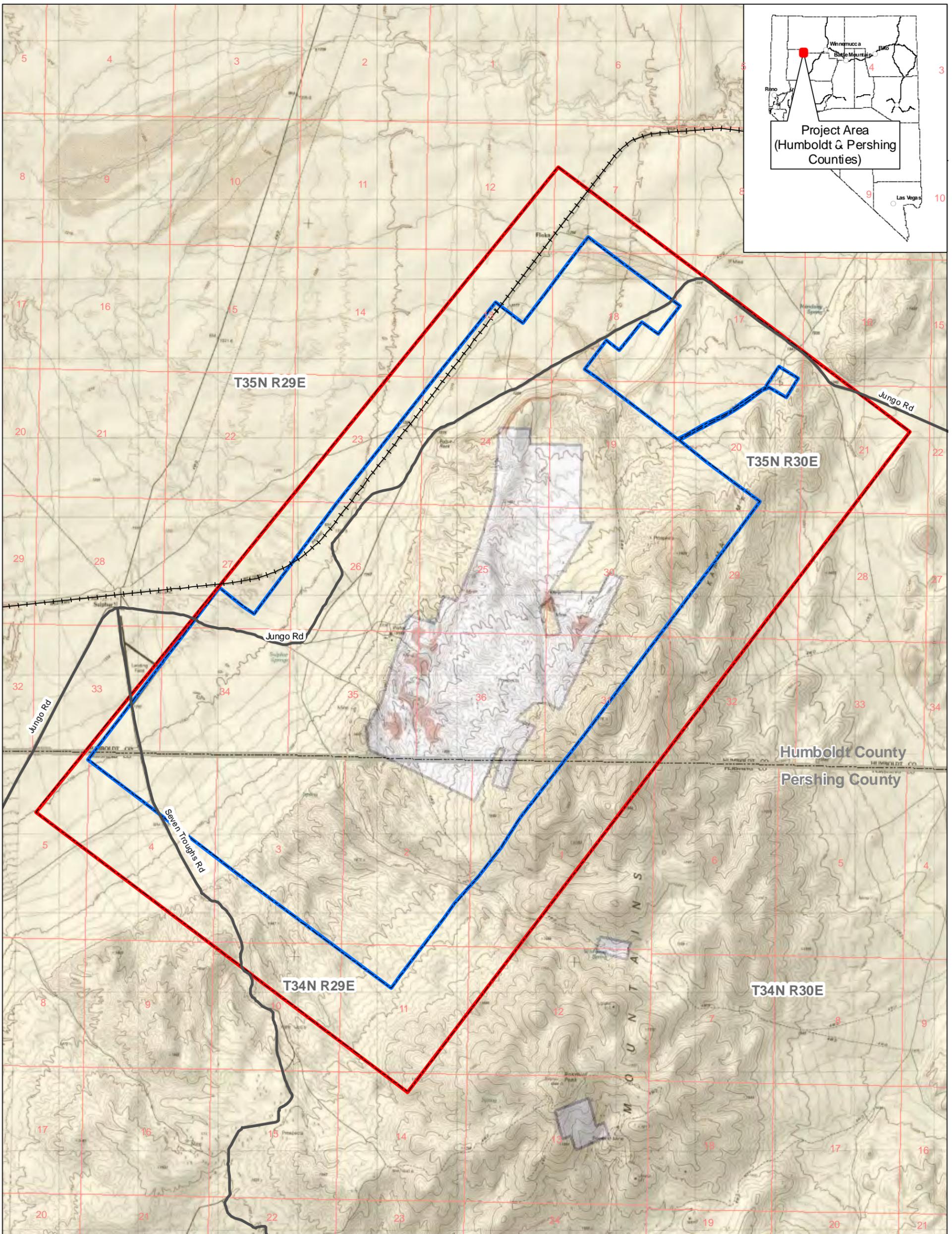
**BUREAU OF LAND MANAGEMENT**

**HYCROFT MINE EXPANSION PROJECT**

Project Location and Access

Figure 1.1.1

11/28/2011



Projection: UTM Zone 11 North, NAD83

- Explanation**
- Existing / Authorized Project Area Boundary
  - Proposed Project Area Boundary
  - Access Road
  - Railroad
  - Land Status**
  - Private Land
  - BLM Managed Land



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1:45,000



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BUREAU OF LAND MANAGEMENT

HYCROFT MINE EXPANSION PROJECT

Land Status and Boundary  
 of Project Area

Figure 1.1.2

11/28/2011

Chapter 4, Cumulative Impacts, includes the following elements:

- Introduction;
- Assumptions for Analysis (including the description of the cumulative effects study area [CESA] boundaries);
- Past and Present Actions;
- Reasonably Foreseeable Future Actions (RFFAs); and
- Cumulative Impacts (for resources identified as having a cumulative effect).

Chapter 5, Mitigation and Monitoring, includes the following elements:

- BLM recommended mitigation and monitoring for each alternative and resource; and
- Environmental Protection Measures identified in Chapter 2 for the Proposed Action and Alternatives.

Chapter 6, List of Preparers, includes the following elements:

- List of BLM Interdisciplinary (ID) Team Members;
- List of Cooperating Agencies; and
- List of Enviroscientists, Inc. Team Members.

Chapter 7, Consultation and Coordination, includes the following elements:

- Description of consultation with Tribes; and
- Consultation with other government entities.

Chapter 8, Public Involvement, includes the following elements:

- Summary of Public Outreach; and
- Public Comments on Draft EIS and Responses to Comments (**Comment letters with substantive comments are included in Appendix A**).

Chapter 9 includes a list of references supporting the EIS document.

Chapter 10 is a glossary for key words found in the EIS document.

Chapter 11 is an alphabetically ordered index.

**For the Final EIS, additions to the text are in bold font and deleted text has been removed.**

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

The purpose of this action is to provide HRDI the opportunity to conduct expanded mining activities including, but not limited to, the following: construction of new haul roads; construction, operation, and reclamation of waste rock and heap leach facilities; expansion of the existing refinery, Brimstone Merrill-Crowe process plant, and open pits; construction of storm water diversions and installation of culverts; construction of one potable water well and one

process well; expansion of maintenance facilities; and to conduct exploration activities throughout the Project Area.

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

#### **1.4 Land Use Plan Conformance**

##### **1.4.1 Sonoma Gerlach Management Framework Plan**

The Proposed Action conforms to the BLM's Sonoma Gerlach Management Framework Plan (MFP) dated July 1982 (BLM 1982a). Specifically, in Section .42 Minerals, Objective M-1 states: "Make all public lands and other federally owned minerals available for the exploration and development of mineral and material commodities."

##### **1.4.2 Paradise Denio Management Framework Plan**

The Proposed Action conforms to the BLM's Paradise Denio MFP dated July 1982 (BLM 1982). Specifically, in Section .42 Minerals, Objective M 1.0 states: "Provide the public the opportunity to acquire minerals from the public lands to meet market demands."

#### **1.5 BLM and Non-BLM Policies, Plans, and Programs**

The following policies, plans, and programs are applicable to the Proposed Action and alternatives:

- Federal Land Policy and Management Act, the Mining and Mineral Policy Act of 1970, and BLM Mineral Policy;
- National Environmental Policy Act;
- Locatable Minerals Surface Management Regulations (43 CFR 3809);
- Humboldt County Regional Master Plan; and
- Pershing County Master Plan.

#### **1.6 Authorizing Actions**

Scoping process information and subsequent discussions with various agencies have identified certain authorizing actions as required, or potentially required, prior to construction or operation of the Project. A list of these authorizing actions organized by agency is provided in Table 1.6-1.

**Table 1.6-1: Major Permits and Authorizations**

<b>Permit/Approval</b>	<b>Granting Agency</b>
Plan of Operations/Record of Decision	United States (U.S.) DOI, BLM
Reclamation Bond Determination	U.S. DOI, BLM; Nevada Division of Environmental Protection (NDEP), Bureau of Mining Regulation and Reclamation
Rights-of-Way	U.S. DOI, BLM
Operating Permit (Air Quality)	NDEP, Bureau of Air Pollution Control (BAPC)

<b>Permit/Approval</b>	<b>Granting Agency</b>
Mercury Operating Permit (Air Quality)	NDEP, BAPC
Water Pollution Control Permit	NDEP, BMRR
Reclamation Permit	NDEP, BMRR
Permit to Appropriate Water	Nevada Division of Water Resources (NDWR)
Industrial Artificial Pond Permits	Nevada Department of Wildlife (NDOW)
Solid Waste Class III Landfill Waiver	NDEP, Bureau of Waste Management
Septic Treatment Permit	NDEP, Bureau of Water Pollution Control
Public Drinking Water System	NDEP, Bureau of Safe Drinking Water
Explosives Permit	U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF)
Hazardous Materials Storage Permit	Nevada Department of Public Safety, State Fire Marshal Division, Hazmat Permitting Office
EPA Hazardous Waste Identification Number	U.S. Environmental Protection Agency (EPA)
Liquefied Petroleum Gas License	Nevada Board for the Regulation of Liquefied Petroleum Gas
Petroleum-Contaminated Soil Management Plan	NDEP, BMRR; U.S. DOI, BLM
Special Use Permit (s)	Humboldt and Pershing Counties

### 1.7 Scoping

The Project Scoping Summary Report documents the activities conducted during the public scoping process, and addresses the issues and concerns identified by the public during the scoping process (Enviroscientists, Inc. [Enviroscientists] 2011b). The scoping report outlines the key issues identified during the scoping process and that the BLM determines necessary for analysis in the EIS, as well as those concerns not considered critical effects of the Proposed Action. A preparation plan was prepared that outlined the EIS process and how each resource would be analyzed in the EIS. The scoping report and preparation plan are on file and available for review during normal business hours at the BLM BRFO in Winnemucca, Nevada.

A Notice of Intent (NOI) to prepare this EIS was published in the Federal Register on Friday, April 1, 2011. The NOI invited scoping comments to be sent to the BLM through June 30, 2011. In addition, on April 4, 2011, a news release entitled “BLM Publishes Notice of Intent for the Initiation of the Hycroft Mine Expansion Environmental Impact Statement” was posted on the BLM’s Winnemucca District Office website and sent to local newspapers. Public scoping meetings for the Project were held on May 10, 11, and 12, 2011.

The meeting on May 10, 2011, was held at the Lovelock Community Center in Lovelock, Nevada. A total of six members of the public attended this meeting, and three written comments were received.

The meeting on May 11, 2011, was held at the Gerlach Community Center in Gerlach, Nevada. A total of six members of the public attended this meeting; however, no written comments were received.

The meeting on May 12, 2011, was held at the Winnemucca Convention Center in Winnemucca, Nevada. A total of ten members of the public attended this meeting and two written comments were received.

In addition to the written comments provided by the public at the scoping meetings, seven additional comment letters were received by the BLM through electronic mail and regular mail

delivery during the scoping period. All comment letters received during the public scoping period have been included in the Project Scoping Summary Report.

## 1.8 Issues

As a result of the public and internal scoping process, the following issues of concern were identified, as outlined below in Table 1.8-1. The table also tells the reader where the comment is addressed in the EIS.

**Table 1.8-1: Issues of Concern Identified in Project Scoping**

<b>Issue</b>	<b>Reference</b>
What are the expected point source and fugitive emissions from the proposed action including particulate matter with aerodynamic diameter less than ten microns (PM <sub>10</sub> ), and 2.5 microns (PM <sub>2.5</sub> ), and greenhouse gases?	Section 3.2 Air and Atmospheric Resources
What are the mercury emissions from the proposed Project?	Section 3.2 Air and Atmospheric Resources
What are the effects to cultural resource sites?	Section 3.3 Cultural Resources
What is the effect of the Project on adjacent mineral resources?	Section 3.8 Geology, Minerals, and Energy
What are the noise effects to the NCA, the nearby private residence, the wilderness area, and the historic trail?	Section 3.9 Noise
What are the effects on the population of Crosby's buckwheat?	Section 3.14 Special Status Species
What are the effects on the availability of Golden eagle nesting habitat?	Section 3.4 Migratory Birds
How would special status bat species be impacted by the Proposed Action?	Section 3.14 Special Status Species
How would increased traffic on Jungo Road affect public safety (i.e., collision with cows or reduced visibility from increased dust?)	Section 3.15 Transportation, Access, and Public Safety
What effect does the Project have on the viewshed?	Section 3.17 Visual Resources
What effect does the Project have on the night skies?	Section 3.17 Visual Resources
What would be the cumulative impacts from the Project?	Chapter 4 Cumulative Impacts

## 1.9 Mine History and Existing and Approved Facilities

### 1.9.1 Mine History

Mining activities in the vicinity of the Hycroft Mine began in 1875 with the discovery of sulfur. Over 200,000 tons of sulfur was produced by underground mining methods from the 1870s through the early 1950s. Small amounts of silver, potash, and mercury were also produced during the early 1900s. In the late 1970s, Homestake Mining Company conducted exploration drilling on claims controlled by the Crofoot family and delineated a small tonnage, bulk-mineable gold deposit near the north end of the existing Project Area along one of the main faults in the area, the Central Fault.

In 1984 Standard Slag Corporation constructed the Lewis Mine, a small (4,000,000-ton) heap leach operation, on patented and unpatented lands leased from Mr. Frank Lewis. The ore processed at the Lewis facility was mined from the northern end of the Central Fault. In 1985, HRDI acquired the Crofoot claim block, and in 1987, procured the Lewis facility and leases from Standard Slag Corporation. Processing activities at the Lewis Mine were terminated in September 1993 and the Lewis site has since been closed. The Crofoot processing facility was constructed by HRDI and began precious metal production in October 1987. The bulk of the ore (66 million tons) hauled to the Crofoot leach pads originated at the Central Fault open pit complex.

In 1997 and early 1998, an additional five million tons of run-of mine material were transported from the Brimstone deposit, an ore body located on another main fault in the area, the East fault, to the Crofoot site. This was the last ore to be placed on the Crofoot heap leach pads. The balance of the ore from the Brimstone deposit went to the Brimstone heap leach pad and plant adjacent to the Brimstone open pit. The Hycroft Mine was placed in a care and maintenance program in late 1998 due to the decrease in gold prices below \$300 per ounce. The process operations continued until 2004 when the process facilities were placed in care and maintenance.

In 2007 HRDI became a wholly owned subsidiary of Allied Nevada Gold Corporation and reactivated open pit mining in the third quarter of 2008. The existing Hycroft Mine is an open pit, heap leach gold and silver mine (NVN-064641). Current operations at the Hycroft Mine include ore extraction and processing, management of water, engineering and environmental studies, permit compliance, and exploration.

## 1.9.2 Existing and Approved Facilities

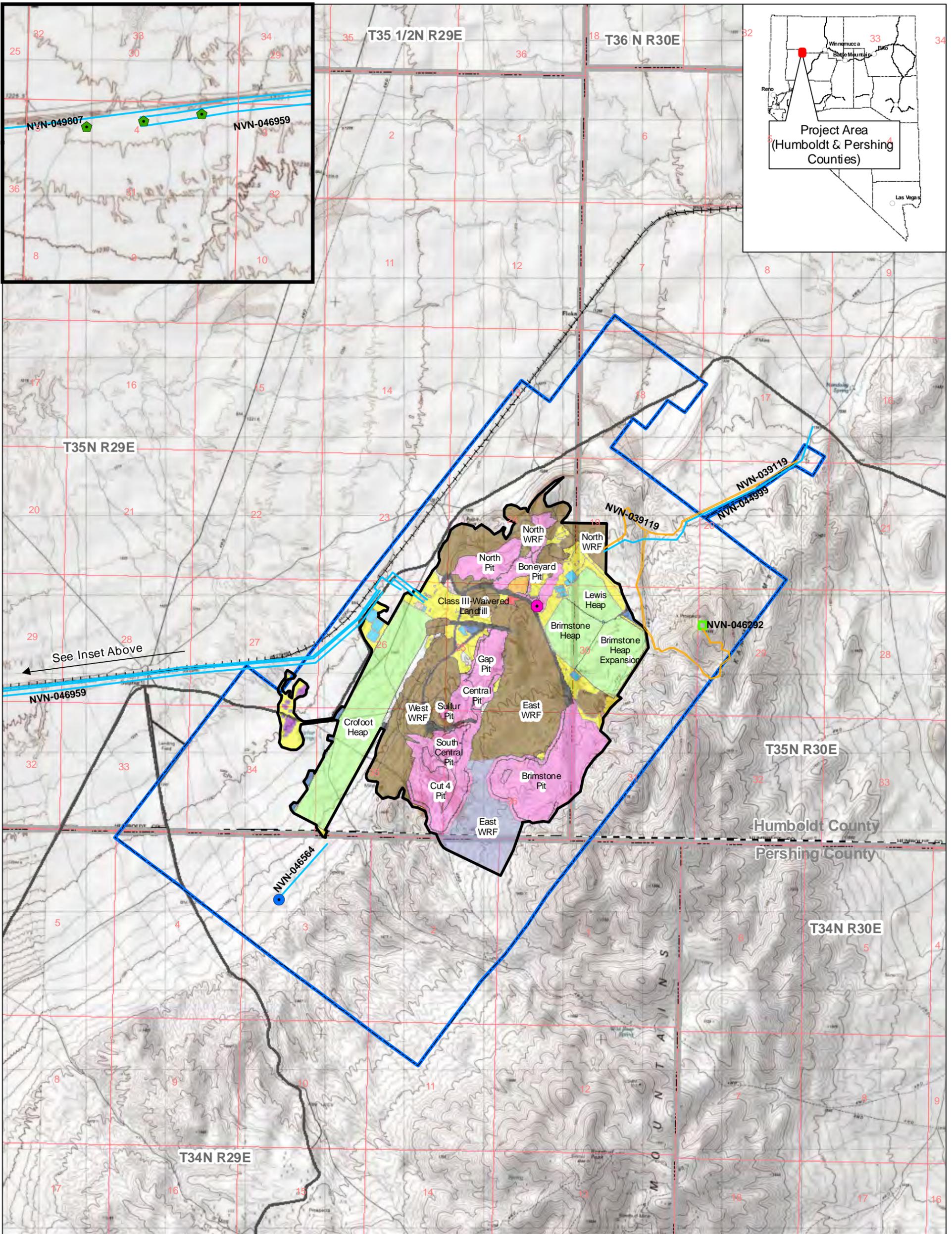
The principal components of the existing Hycroft Mine include the following:

- Brimstone open pit, Central open pit area (including the South-Central, **Crofoot**, Sulfur, **Center Cut 4** open pits) **North** open pit, Gap open pit, and Boneyard open pit;
- North, East, and West WRF complexes including prill towers and powder magazines;
- Crofoot facilities;
- Brimstone heap leach facility;
- Brimstone portable crusher units and conveyors;
- Brimstone facilities;
- Lime silos;
- Carbon columns; and
- Water distribution system including water wells, fresh water storage ponds, and a potable water tank and distribution system.

The existing, as of December 2011, and authorized surface disturbance by facility and land status is provided in Table 1.9-1. Figure 1.9.1 shows the existing and authorized disturbance within the existing Plan boundary. The acreages have been rounded to the nearest whole number for this EIS.

**Table 1.9-1: Existing and Authorized Disturbance Acreage**

Facility	Existing Disturbance (acres)			Authorized Disturbance (acres)		
	Public	Private	Total	Public	Private	Total
<b>Roads</b>						
Exploration Roads and Pads	5	33	38	20	54	74
Small Vehicle Mine Roads	19	15	34	20	15	35
Haul Roads	38	22	60	45	23	68
<b>Total Road Acres</b>	<b>62</b>	<b>70</b>	<b>132</b>	<b>85</b>	<b>92</b>	<b>177</b>
<b>Open Pits, Adits, Trenches</b>						
Boneyard Open Pit	0	20	20	0	20	20
Brimstone Open Pit	26	189	215	28	256	284
Central Open Pit Area (includes South-Central, Sulfur, Center Cut 4 pits)	26	162	188	25	226	251
Crofoot Open Pit	3	1	4	3	1	4
Gap Open Pit	40	39	79	40	39	79
North Open Pit	80	41	121	80	41	121
<b>Total Open Pit, Adit, Trench Acres</b>	<b>175</b>	<b>452</b>	<b>627</b>	<b>176</b>	<b>583</b>	<b>759</b>
<b>Process Ponds and Pond Areas</b>						
Brimstone Ponds	0	3	3	0	3	3
Crofoot Ponds	12	0	12	13	0	13
Freshwater Ponds	2	2	4	2	2	4
Lewis Ponds	0	2	2	0	5	5
<b>Total Pond Acres</b>	<b>14</b>	<b>7</b>	<b>21</b>	<b>15</b>	<b>10</b>	<b>25</b>
<b>Heap Leach Pads</b>						
Crofoot Heap	354	0	354	354	0	354
Brimstone Heap - Phase I	0	91	91	0	93	93
Brimstone Heap - Phase II	91	40	131	91	40	131
Lewis Heap	6	57	63	6	61	67
<b>Total Heap Leach Pads Acres</b>	<b>451</b>	<b>188</b>	<b>639</b>	<b>451</b>	<b>194</b>	<b>645</b>
<b>Waste Rock Facilities</b>						
East WRF	5	315	320	5	556	561
North WRF	164	98	262	164	114	278
West WRF	234	21	255	242	22	264
<b>Total WRF Acres</b>	<b>403</b>	<b>434</b>	<b>837</b>	<b>411</b>	<b>692</b>	<b>1,103</b>
<b>Ancillary</b>						
Borrow Area	14	0	14	14	0	14
Growth Media Stockpile	16	0	16	16	0	16
Miscellaneous	181	114	295	181	114	295
Foundations and Buildings	3	1	4	3	1	4
Stockpile	4	7	11	4	7	11
Landfill	3	2	5	3	2	5
<b>Total Ancillary Acres</b>	<b>221</b>	<b>124</b>	<b>345</b>	<b>221</b>	<b>124</b>	<b>345</b>
<b>Lewis Camp Acreage</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>0</b>	<b>9</b>
<b>Total Acres</b>	<b>1,335</b>	<b>1,275</b>	<b>2,610</b>	<b>1,368</b>	<b>1,695</b>	<b>3,063</b>



**Explanation**

- Existing Project Area Boundary
- Existing/Authorized Disturbance
- Borrow Area
- Waste Rock Dump/Pit
- Structure
- Ancillary Facilities
- Growth Media Stockpile
- Haul Road
- Class III-Waivered Landfill
- Heap Leach Pads
- Open Pits
- Pond
- Ore Stockpile
- Waste Rock Facility
- Right-of-Way
- ◆ Production Well Authorized
- Potable Well Authorized
- PCS Treatment (Bioremediation Cell)
- Road Right-of-Way
- Utility Right-of-Way
- County Road
- Railroad

Projection: UTM Zone 11 North, NAD83

Scale: 1:45,000

0 0.25 0.5 1 Miles



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**HYCROFT MINE EXPANSION PROJECT**

Existing and Authorized  
Disturbance and Facilities

Figure 1.9.1

11/28/2011

### 1.9.2.1 Open Pits

HRDI has excavated ore and waste rock from seven different open pits during the life of the mine. Some of the open pits have been backfilled with waste rock. The existing and authorized actions would result in the open pit parameters shown in Table 1.9-2. Authorized mining would continue to occur in the Brimstone and South-Central open pits.

**Table 1.9-2: Existing and Authorized Open Pit Parameters**

Open Pit	Maximum Slope Angle	Bench Heights	Depth (feet amsl)	Percent Backfilled
Brimstone	40° - 46°	25	4,300	0
Boneyard	46°	25	4,500	10
South-Central	46°	25	4,475	25
<b>Central/Cut 4</b>	46°	25	4,225	25
Sulfur	46°	25	4,500	100
Gap	46°	25	4,225	15
North	46°	25	4,325	80

Source: HRDI 2010a. -

Notes: ° = degrees; amsl = above mean sea level -

### 1.9.2.2 Waste Rock Facilities

The WRFs are consolidated into three general areas: the North, East, and West WRFs (Figure 1.9.1). The North WRF includes the areas north of the Crofoot heap leach facility to the Brimstone open pit haul road and north and west of the Boneyard open pit. The West WRF includes the areas south of the same haul road and west of the **Central** open pit. The East WRF includes the area on the east side of the **Central** open pit and south of the Brimstone heap leach facility. Table 1.9-3 presents a summary of the WRF parameters.

**Table 1.9-3: Existing and Authorized Waste Rock Facility Parameters**

Waste Rock Facility	Working Slope	Authorized Reclaimed Slope	Bench Height (feet)	Elevation (feet amsl)
North	1.3H:1V	3.0H:1V <sup>1</sup>	40 - 50 <sup>1</sup>	4,360 (west) – 4,624 (east)
East	1.3H:1V	3.0H:1V	40 – 120	5,050
West	1.3H:1V	3.0H:1V	40 – 125	4,540

Source: HRDI 2010a.

Notes: H:V = horizontal to vertical

<sup>1</sup>Portions of the North WRF have been authorized for reclamation slopes of 2.5H:1V per an August 17, 2009, amendment modified in an August 25, 2009, letter and accepted by the BLM in a February 1, 2010, letter.

### 1.9.2.3 Heap Leach Facilities

#### 1.9.2.3.1 Crofoot Heap Leach Facility

The Crofoot heap leach facility consists of four individual leach pad phases (Pads 1, 2, 3, and Infill) with a resulting total lined area of approximately 14.3 million square feet. The majority of the ore processed at the Crofoot heap leach facility was mined from the Central Fault open pit complex and the small, adjacent Boneyard open pit. The method of excavating metal-bearing ore for placement on the Crofoot heap leach pads consisted of conventional drill and blast mining

techniques utilizing large hydraulic excavators and off-highway haulage trucks with up to a 150-ton capacity.

The facility contains approximately 70.8 million tons of ore consisting of 46 million tons of crushed ore and 24.8 million tons of run-of-mine ore. The maximum heap height varies from approximately 205 feet in one location on Pad 1 to 30 feet at the southern side of Pad 3. Pad side-slope angles vary from 2H:1V on Pad 1 to 3H:1V on Pad 3.

A preliminary cover evaluation was performed in support of the Crofoot heap leach facility in 2001. This report determined that little benefit was seen in reducing infiltration by capping and that more than one-foot of material gave no incidental benefit. HRDI has performed further investigations on the effectiveness of cover materials used at the closed Lewis heap leach facility and evaluated the available materials (Applied Soil and Water Technologies [ASW] 2010).

The following components have been authorized by the BLM and NDEP BMRR:

- Phased heap leach Pads 1,2,3, and the Infill pad;
- Low-grade preg pond, high-grade preg pond, and their respective leak detection and French drain systems, and the emergency overflow pond;
- Associated facilities and equipment including solution ditches, transfer pipes, valves, pumps and tanks; and
- The Merrill-Crowe process plant, refinery, process building and building contents including all tanks, sumps, pumps, clarifiers, presses, piping, furnaces and retorts, as well as associated plant ponds, including the diatomaceous earth (DE) Settling pond and Barren pond.

The following planned closure activities are authorized under the existing 43CFR3809 action:

- Decontaminate, close, and regrade the Barren and DE ponds;
- Decontaminate and remove the Merrill Crowe Plant and refinery equipment;
- Construct a new draindown collection system on the western boundary of the heap leach pads; and
- Regrade the spent heaps.

#### 1.9.2.3.2 Brimstone Heap Leach Facility

The Brimstone heap leach facility consists primarily of caustic and sodium cyanide tanks, a two phased heap, preg pond, barren pond, DE settling pond, a Merrill-Crowe process plant with carbon columns, and a pond used for process solution and emergency overflow capacity, which was previously used as a preg pond for the Lewis Project. Solution processing and precious metal recovery is accommodated at the Merrill Crowe process plant. Pregnant solution is buffered, fortified with sodium cyanide, and then clarified with filters. The clarified solution is deaerated with vacuum pumps and a packed vacuum tower. Zinc dust is added to the clarified/deaerated solution to precipitate gold, silver and mercury which occurs naturally in the ore mined at the Hycroft Mine. Gold, silver, and mercury precipitates are captured with plate filters and then loaded into the mercury retort.

The retort volatilizes mercury present in the precipitates to a gaseous phase. The off gases from the retort are captured and routed through a condenser and carbon scrubber system. Mercury is collected from the condenser, placed in mercury flasks and subsequently shipped off site as a co-product at least on a semi-annual basis in accordance with Nevada Department of Transportation (NDOT) regulations and mercury shipment standard operating procedures. Mercury is not processed further at the site. The retorted precipitates are then fired in the smelting furnace to remove the impurities from the gold and silver. Barren solution from the Merrill Crowe plant is discharged to the barren pond and recirculated back to the Brimstone heap leach facility.

#### 1.9.2.4 Growth Media Stockpiles and Clay Stockpile

Five growth media stockpiles are located around the perimeter of the Crofoot heap leach facility. The clay stockpile is located near the Brimstone heap leach facility. Table 1.9-4 presents a summary of the entire existing growth media stockpile volumes within the existing mine boundary.

**Table 1.9-4: Existing Growth Media Stockpile Volumes**

New ID#	Location	Volume (cubic yards)
HR-1	Crofoot, Haul Road Ramp to Crofoot	251,200
GM-6	Crofoot	5,000
GM-5	Crofoot	16,800
GM-4	Crofoot	22,700
GM-3	Crofoot	20,300
GM-2	Crofoot	48,100
GM-1	Crofoot	8,900
TS-7	Admin Area	5,000
W-9	Northeast of Main Admin Area	675,555
W-11	Haul Road at Northeast corner of Crofoot Pad	518,500
W-29	North Brimstone	1,368,000
W-31	Brimstone	1,770,000
<b>Total Growth Media (Alluvium)</b>		<b>4,710,055</b>

Source: HRDI 2010a -

Notes: ID# = identification number -

#### 1.9.2.5 Water Supply

HRDI currently holds water rights for approximately 1.6 billion gallons of annual consumption. Current consumption is approximately 900 million gallons per year.

The production wells are completed in deposits characterized by distinct layers of sand, gravel and clay/silt and therefore, are permeable and can produce usable quantities of ground water. Initial pump tests on the existing production and potable water wells showed favorable ground water replenishment to the aquifer in the vicinity of the well with projections of zero residual drain down. The full range of drawdown was tested with full ground water rebound achieved within ten hours. Pumping activities to date have confirmed these findings, with the wells producing adequate quantities of water and ground water levels replenishing during the times of temporary closure.

The Hycroft Mine water distribution system consists of a potable water well and two production wells (each capable of producing 1,800 gallons per minute (gpm), two freshwater storage ponds, and a distribution system. Water is pumped from wells located in T25N, R29E, section 31 (Figure 1.9.1) to the storage pond located east of the Crofoot Merrill-Crowe process plant via a steel pipeline. Water is gravity fed to the Crofoot process plant where it is pumped up to the north storage pond, located south of the Brimstone heap or sent to the Crofoot process stream as make-up water. Water sent to the Brimstone fresh water pond is piped to the Brimstone process plant where it is incorporated as make-up water. Water from both ponds is also used for fire suppression and dust suppression on roads, and for drilling.

1.9.2.6 Ancillary and Support Activities and Facilities

Existing ancillary facilities include the following:

- Petroleum contaminated soils (PCS) storage and treatment pads;
- Fuel storage and dispensing stations;
- Truck shop, electrical shop, light vehicle shop, carpenter shop;
- Septic systems;
- Truck wash;
- Class III-waivered landfill;
- Maintenance shops, administration building, laboratory, warehouse;
- Storm water diversions and control features;
- Light vehicle roads;
- Substations;
- Project facility fencing;
- Lewis Camp; and
- Clay borrow area.

1.9.2.6.1 Employment and Transportation

The Hycroft Mine has operated since 1984 and employment has varied during that time in response to operational requirements. Table 1.9-5 shows the historical high employment during 1996 compared to the 2010 rates.

**Table 1.9-5: Historic and 2010 Mine Employment**

Department	1996 Employment (Historic High)	2010 Employment
Mine Maintenance	84	23
Mine Operations	52	88
Mine Engineering and Management	15	0
<b>Mine Total</b>	<b>151</b>	<b>111</b>
Process Technical and Management	18	0
Process Operations	33	24
Process Maintenance	17	8
<b>Process Total</b>	<b>68</b>	<b>32</b>
Administration	20	16
<b>Total</b>	<b>239</b>	<b>159</b>

Presently HRDI operates **four** buses to transport employees to and from the employee parking lots in Winnemucca to the mine. These buses operate twice daily concurrent with the 12-hour shifts. Other light vehicles transport employees on a four-day, ten-hour shift basis.

#### 1.9.2.6.2 Mine Power Supply

Power is delivered to Hycroft via an overhead 69 kilovolt (kV) powerline from Imlay. Power is distributed on the mine site from two substations. The Crofoot substation is rated at approximately 6,250 kilovolt amperes (kVA) and the Brimstone Substation is rated at 3,750 kVA. An overhead 4,180-volt powerline delivers power to the potable and production wells.

#### 1.9.2.6.3 Haul Roads and Access Roads

Haul roads are situated throughout the existing Project Area boundary. These haul roads generally have a running width of approximately 110 to 120 feet with a maximum gradient of approximately ten percent. As the WRFs advance toward the open pit, these road segments are incorporated into the WRF areas. These roads are constructed according to Mine Safety and Health Administration (MSHA) standards that include a berm height at least half the wheel height of the largest vehicle utilizing the road. Runoff from haul and access roads is collected and routed to sediment retention ponds as necessary. Water trucks are used to control dust.

Secondary roads are approximately 15 feet in width. These roads are also bermed in accordance with MSHA regulations. Best Management Practices (BMPs) are used where necessary to control erosion, and water trucks are used to control dust.

#### 1.9.2.6.4 Fuels and Reagents

HRDI uses a variety of fuels and reagents in the mining and processing activities. These reagents are transported and transferred from trucks to the container/containment, used, and disposed of according to federal and state regulations. Table 1.9-6 provides a summary of the existing fuels and reagents used at the existing mine.

**Table 1.9-6: Summary of Existing Fuels and Reagents Usage**

Reagent	Approximate Consumption per Day	Approximate Amount per Delivery	Trucks per Month	Storage Amount	Storage Method
Off-road Diesel Fuel	9,000 gallons	10,000 gallons	27	10,000; 30,000; 20,000; and 20,000 (four tanks)	Above ground tanks
Unleaded Gasoline	200 gallons	5,000 gallons	2	5,000 gallons	Above ground tanks
Motor Oils	144 gallons	3,000 gallons	6	11,000 gallons	Bulk storage tanks
Antifreeze	26 gallons	3,000 gallons	0.25	5,000 gallons	Above ground tanks
Propane	350 gallons	10,000 gallons	2	18,000 gallons	Above ground tanks

Reagent	Approximate Consumption per Day	Approximate Amount per Delivery	Trucks per Month	Storage Amount	Storage Method
Sodium Cyanide Solution ( $\leq 2\%$ )	5,000 gallons	6,000 gallons	25	6,000 gallons; 21,000 gallons (two tanks)	Above ground tanks
Prill	38,400 pounds	62,500 pounds	19	125,000 pounds (two silos)	Silos
Lime	140,000 pounds	70,000 pounds	60	150 tons each (four silos)	Silos
Antiscalant	290 gallons	5,000 gallons	2	3,000 gallons; 5,000 gallons (two tanks)	Above ground tanks

Notes:  $\leq$  = less than or equal to

#### 1.9.2.6.5 Petroleum Contaminated Soil Bioremediation

PCS may be generated either by inadvertent spills or by leakage from equipment and machinery as part of routine operations, and may occur from either stationary (point) sources or from mobile (non-point) sources such as vehicles and other mobile equipment. HRDI has developed a PCS management plan to address the identification and characterization of individual PCS sources, delineation of PCS source types, interim management of PCS, contingency plans and monitoring and reporting requirements associated with the PCS management program.

Presently, PCS is transferred to a holding pad or to provisional, short-term placement at the on-site disposal facility (shown on Figure 1.9.1) until screening is completed to determine the PCS's suitability for on-site disposal or off-site disposal. On-site disposal may include the placement of the PCS on the existing bioremediation cell per the General Mining Bioremediation Permit (GNV 041995). This permit allows HRDI to place material on a lined facility to actively treat or dispose of PCS as defined in *Mining Sites Hydrocarbon Contaminated Spoil Definitions and Guidelines (April 5, 1995)*. Based on past records, operational changes, and anticipated increases in production, the estimated PCS generation rate is approximately 250 cubic yards per year.

Monitoring includes documenting the volume of material added and removed, the origin and destination of the material, and total volume present. Quarterly monitoring reports are completed and submitted to NDEP as part of HRDI's Water Pollution Control Permit (WPCP) quarterly monitoring reports. These monitoring reports must be submitted to the NDEP on or before the 28th day of the month following the calendar-year quarter. The reports also include the analytical results of the PCS screening for each holding pad and disposal location.

#### 1.9.2.7 Emergency Response and Contingency Plan

An emergency response and contingency plan is maintained at the site. This plan establishes methods for preventing and responding to environmental releases and outlines responsibilities for notification of various state and federal agencies in the event of a release.

The plan describes emergency preparedness and the tools and equipment available to mine personnel such as the required personal protective equipment, first aid kits, fire extinguishers and other fire suppression equipment, hazardous material identification, and spill prevention and countermeasures.

### 1.9.2.8 Solid and Hazardous Waste Management Plan

HRDI has developed a solid and hazardous waste management plan to ensure compliance with federal, state, and local solid and hazardous waste regulations. Management practices include the following:

- Acceptable non-hazardous solid wastes (garbage) are disposed on site in a permitted landfill;
- Waste rock from mining and re-handling operations is used for backfill, cover/capping materials and construction;
- Hazardous wastes are disposed off site at permitted hazardous waste incineration or landfill disposal facilities;
- Universal wastes are recycled off site at permitted universal waste handling facilities;
- Designated non-hazardous wastes are disposed off site at approved facilities;
- Used oil is recycled off site at approved facilities;
- Used coolant (antifreeze) is recycled on site or off site at approved facilities;
- PCS is staged on site in a permitted treatment area;
- Recyclable materials are recycled off site at approved facilities;
- Contractor wastes comply with federal and state hazardous waste regulations;
- Electronic wastes are managed at off-site approved facilities; and
- Waste minimization is practiced at the mine site, and materials are recycled when practicable.

The Class III-waivered landfill is located in a partially-backfilled portion of the Center open pit and is surrounded by mine waste rock backfill on three sides and the east highwall of the open pit on the fourth side (Figure 1.9.1). The landfill is operated in compliance with the solid waste permit.

### 1.9.2.9 HRDI Rights-of-Way

A number of existing rights-of-way (ROWs) are within the existing Plan boundary and in the vicinity of the Project authorized specifically for the Project and are listed in Table 1.9-7. The ROWs associated with the Project are shown in Figure 1.9.1.

**Table 1.9-7: Existing Rights-of-Way within the Hycroft Mine Project Area**

<b>Right-of-Way No.</b>	<b>Description</b>	<b>Holder</b>
NVN-039119	Water line/road	HRDI
NVN-046292	Microwave repeater	HRDI
NVN-046564	Powerline, wells, water line	HRDI
NVN-046959	Pipeline, two wells, water line	HRDI
NVN-044999	Water pipeline from the Mabel Crofoot Estate	HRDI

### 1.9.2.10 Reclaimed Areas

Reclamation has been conducted on the Lewis heap leach facility, and areas on the WRFs. The Hycroft reclamation plan specified a cover standard of 50 percent for determination of

reclamation success. The Lewis heap was originally constructed in 1984 and operated until 1992. The NDEP authorized closure activities and closure was initiated in 1992; final closure and permit release was granted by NDEP in 2005 after eight years of post-closure monitoring. The facility consisted of a heap, solution ponds, and a Merrill-Crowe process plant. Closure consisted of rinsing the spent heap with fresh water and disposal of the rinse solution via evaporation with the residual solution reporting to a leach field. Spent ore that was rinsed was authorized for subsequent uses such as blast hole stemming material, road base, structural fill, and as drain gravel on the Brimstone heap leach facility. Pond sediments were removed and the ponds were backfilled with the exception of the Lewis preg pond, which was incorporated into the Brimstone WPCP (NEV94114).

In early 1999, the heap was recontoured and the sideslopes were regraded to between 2.5H:1V and 3H:1V. The Lewis heap, consisting of the crushed ore and run-of-mine heaps, was graded, growth media was placed, and the areas seeded in 1998 and 1999. Approximately six inches of alluvium was placed over the disturbed areas. During these activities, approximately 25,000 tons of material was sloped off and outside of the lined area, so that the reclaimed heap would better conform to the surrounding topography. The polyvinyl chloride (PVC) leach pad and solution ditch liners were covered, but left intact, and concrete weir boxes were constructed to divert effluent flow from a pipeline into the disposal facility. The material applied onto the heap as growth media consisted of alluvium soils, which was transported from growth media stockpiles established during excavation of the nearby Brimstone open pit and shown on Figure 1.9.1.

Vegetation sampling was conducted in 2004 on several areas that were expected to meet the revegetation standards. Fifteen transects were established and samples using both the line intercept method and belt line transects were collected. Each transect was established using a global positioning system (GPS) and marked in the field with fence posts. Two transects, located on adjacent undisturbed land, were representative of vegetation located on upland areas in and around the mine. These two transects represent a “Reclaimed Desired Plant Community.” Thirteen transects were established on reclaimed areas identified as having been regraded, covered with growth media, and seeded. These areas have had reclamation activity as early as 1993, and most areas were seeded or reseeded in 1998/1999 for a range of four to ten growing seasons since the original seeding. The sampling results indicated that overall, the revegetation was successful and the plant diversity of the reclaimed areas was comparable to the diversity of the native vegetation for the reference areas. Plant cover on the reclaimed areas was comparable to the reference areas and met or exceeded 50 percent of the cover on the reference areas. In most cases the cover met or exceeded 100 percent of the cover on the reference areas. Figure 1.9.2 shows an example of successful reclamation in the Project Area.

**Figure 1.9.2: Photograph of Existing Successful Project Reclamation**



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