United States Department of the Interior
Bureau of Land Management

Elko Field Office
Elko, Nevada

July 2002

ENVIRONMENTAL ASSESSMENT

BLM/EK/PL-2002/023

NEWMONT: Pete Project

File: 3809, NVN-70574

MISSION STATEMENT

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times. Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific and cultural values.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Elko Field Office
3900 East Idaho Street
Elko, Nevada 89801
http://www.nv.blm.gov/Elko

In Reply Refer To:
3809(NV-013)
N16-81-010P
NVN-70574

JUL 12 2002

Dear Reader:

Enclosed for your review is the Finding of No Significant Impact (FONSI) for the Pete Project Environmental Assessment (EA). The project proposal includes the development and operation of mining three open pits: Pete, Castle Reef, and Crow; construction of the Pete South Waste Rock Disposal Facility, and the construction of a refractory ore stockpile. The proposed new surface disturbance for this project is 863 acres, which consists of 520 acres of public land and 343 acres of private land.

Comments concerning this FONSI need to be received in the Bureau of Land Management, Elko Field Office by close of business on August 22, 2002. At the conclusion of the public review period a decision will be made regarding approval of the project. Comments should be sent to the following address:

Bureau of Land Management
Attn: Pete Project Coordinator
3900 East Idaho Street
Elko, Nevada 89801-4611

Please direct comments or questions to Janice Stadelman, Project Coordinator, at the above address or by calling (775) 753-0346.

Sincerely,

DAVID J. VANDENBERG, Manager
Nonrenewable Resources

Enclosures: Pete Project FONSI
Pete Project Environmental Assessment

FINDING OF NO SIGNIFICANT IMPACT
PETE PROJECT
ENVIRONMENTAL ASSESSMENT
BLM/EK/PL-2002/023
(3809, NVN-70574)

Finding of No Significant Impact:

Based on the analysis of potential environmental impacts contained in the attached Environmental Assessment BLM/EK/PL-2002/023. I have determined that the proposed Pete Project would not have a significant effect on the human environment, and therefore, an environmental impact statement will not be prepared.

Background:

The proposed action to allow Newmont Mining Corporation (Newmont) to expand the mining operations at the existing Carlin Operations Area, known as the Pete Project, has been analyzed in the Pete Project Environmental Assessment BLM/EK/PL-2002/023. This document presents an environmental evaluation of the proposed action on the human environment. Newmont is proposing new surface disturbance totaling 863 acres (520 acres of public land and 343 acres of private land). The proposed action consists of the development and operation of mining three open pits: Pete, Castle Reef, and Crow; construction of the Pete South Waste Rock Disposal Facility, and the construction of a refractory ore stockpile.

Rationale:

Based on the definition of significance in the Council on Environmental Quality regulations at 40 CFR 1508.27, no potentially significant impacts are expected from the implementation of the Proposed Action. The following items address the identified issues and concerns for the project and any necessary mitigation which supports a finding of no significant impact:

- This project does not require dewatering in order to mine the ore deposits; therefore, no dewatering is proposed for the project.

  The proposed Pete Project is located within the mule deer migration corridor used by mule deer migrating between high-elevation summer range in the Tuscarora and Independence Mountains to the north and lower elevation winter range areas to the south and southwest in the Dunphy Hills area and southern end of the Tuscarora Mountains.

  Newmont, in consultation with the Bureau of Land Management and Nevada Division of Wildlife, modified the design of the Pete Project to develop a means to provide continued use of the mule deer migration corridor, prevent the potential for acid rock drainage from the waste rock disposal facility, and mitigate the loss of two seep/springs.

The Crow pit has been designed to allow for the continued migration of mule deer during the mining operation, and would be sequentially backfilled to allow the mule deer migration corridor to return to premining conditions upon cessation of mining.

Potentially acid generating waste rock material would be encapsulated in the waste rock disposal facility. The waste rock disposal facility would be constructed on an engineered base designed to collect any acidic solution, which would be utilized in the ore processing.

French drains would be constructed at the two seep/springs that would be covered by the Pete South Waste Rock Disposal Facility, which would allow for drainage and re-establishment of the water resource at the edge of the facility.

At the time of closure and reclamation, the facilities on this site would be reclaimed to ensure public safety, stabilize the site, and establish a productive vegetative community consistent with post-mining land uses.

Sensitive resource values would not be adversely impacted from implementation of the Proposed Action.

There would be no adverse affect on threatened, endangered, candidate or special status species within the assessment area.

The project would not adversely affect or cause destruction of significant scientific cultural, or historical resources.

The Proposed Action would not adversely affect public health or safety. The project and its potential effects on the human environment are not highly uncertain and do not involve unique or unknown risks.

Mitigation for the loss of vegetation, as a result of the Pete and Castle Reef open-pits, has been established for sage grouse habitat and mule deer winter range.

> Sage grouse habitat mitigation would consist of mechanical and/or chemical manipulation/treatment of 74 acres of mature stands of sagebrush in a patchwork pattern and reseeding the area with an appropriate herbaceous seed mixture to improve forage diversity and cover for sage grouse.
>
> Mule deer winter range habitat mitigation consists of seeding 264 acres of mule deer winter range in the Dunphy Hills and Bob's Flat areas.

Helen Hankins

Helen Hankins
Elko Field Office Manager

July 12, 2002
Date

ENVIRONMENTAL ASSESSMENT
PETE PROJECT

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CHAPTER 1

INTRODUCTION/PURPOSE AND NEED

The Elko Field Office of the United States Department of the Interior (USDI) Bureau of Land Management (BLM) received a proposal to amend the existing Carlin Operations Area Plan of Operations (Plan) N-70574 from Newmont Gold Company in July 1999. The amendment describes proposed development and operation of three open pit mines and associated surface support facilities in the Pete Project area. Since 1999, Newmont Gold Company has become Newmont Mining Corporation (Newmont). In August 2001, Newmont submitted a revised amendment for development of the Pete Project ore deposits. The Pete Project area is located on public and private land in Eureka County, Nevada approximately 21 miles northwest of Carlin, Nevada (**Figure 1-1**).

Proposed facilities in the Pete Project area are located in part on public land administered by BLM. Consequently, review and approval of Newmont's Plan is required by BLM pursuant to Title 43, Code of Federal Regulations, Part 3809 (43 CFR 3809) Surface Management Regulations.

Authorizing actions by BLM must also comply with requirements of the National Environmental Policy Act (NEPA) of 1969, Mining and Mineral Policy Act of 1970, and the Federal Land Policy and Management Act of 1976. These laws recognize the statutory right of mining claim holders to develop federal mineral resources under the General Mining Law of 1872. These laws, however, in combination with other BLM policies (i.e., Resource Management Plan) also require BLM to analyze proposed mining operations to ensure: 1) adequate provisions are included to prevent undue or unnecessary degradation of public land, 2) measures are included to provide reasonable reclamation of disturbed areas, and 3) proposed operations would comply with other applicable federal, state, and local statutes and regulations. BLM has determined that an Environmental Assessment (EA) would be completed to analyze potential impacts of the Pete Project (Proposed Action) under NEPA.

BLM is serving as lead agency in preparing this EA for the Proposed Action. This document follows regulations promulgated by the Council on Environmental Quality (CEQ) for implementing procedural provisions of NEPA (40 CFR 1500-1508) and BLM's NEPA Handbook (H-1790-1). This EA is used to determine whether potential impacts on quality of the human environment that would result from the Proposed Action are significant and, therefore, would require preparation of an environmental impact statement (EIS). If impacts resulting from the Proposed Action are determined to not be significant, BLM would complete a Finding of No Significant Impact (FONSI).

This EA describes components of, reasonable alternatives to, and environmental consequences of proposed mining and waste rock disposal operations associated with the Proposed Action. Chapter 1 describes purpose and need for action, the role of BLM, and public participation in the EA process. Chapter 2 provides historical perspective of gold mining in the Carlin Trend area, description of existing mining and mineral exploration operations, description of the Proposed Action, and Alternatives to the Proposed Action. Chapter 3 describes the existing environment in the Pete Project area. Chapter 4 details potential direct, indirect, and cumulative effects associated with the Proposed Action and Alternatives, and possible mitigation measures that may be selected to reduce or minimize impacts. Chapter 5 identifies the consultation and coordination with state and federal agencies that occurred during preparation of this EA and contains a list of preparers of the EA. Chapter 6 contains a list of references cited in developing the EA.

PURPOSE OF AND NEED FOR ACTION

The purpose of Newmont's proposal is to use the existing mining work force to conduct open pit mining on patented and unpatented mining claims and fee land within the Pete Project area to produce gold from ore reserves contained in multiple ore deposits. Gold is an established commodity with international markets and demand. Uses include jewelry, investments, standard for monetary systems, electronics, and other industrial applications.

AUTHORIZING ACTIONS

A proposal submitted to BLM may be approved only after an environmental analysis is completed as required by NEPA. BLM decision options include approving Newmont's Plan of Operations as submitted, approving alternatives to the Plan of Operations to mitigate environmental impacts, approving the Plan of Operations with stipulations to mitigate environmental impacts, or requiring an EIS be completed to disclose significant impacts. If the Plan of Operations, alternatives, and/or mitigation measures are approved, BLM would prepare a FONSI. If BLM determines that an EIS is necessary, BLM would initiate the EIS process through placement of a Notice of Intent in the Federal Register. Newmont can modify and resubmit the Plan of Operations for the Pete Project to address decisions made by BLM.

In addition to BLM, other federal, state, and local agencies have jurisdiction over certain aspects of the Proposed Action. **Table 1-1** provides a comprehensive listing of agencies and their respective permit/authorizing responsibilities. The primary permits to be obtained by Newmont include a reclamation permit, air quality operating permit, and a stormwater discharge permit.

Newmont has submitted a jurisdictional wetlands and waters of the U.S. survey to the U.S. Army Corps of Engineers (USCOE) for verification under Section 404 of the Clean Water Act. If necessary, Newmont would apply for authorization under Section 404 should the proposed activity result in dredge or fill of wetland areas.

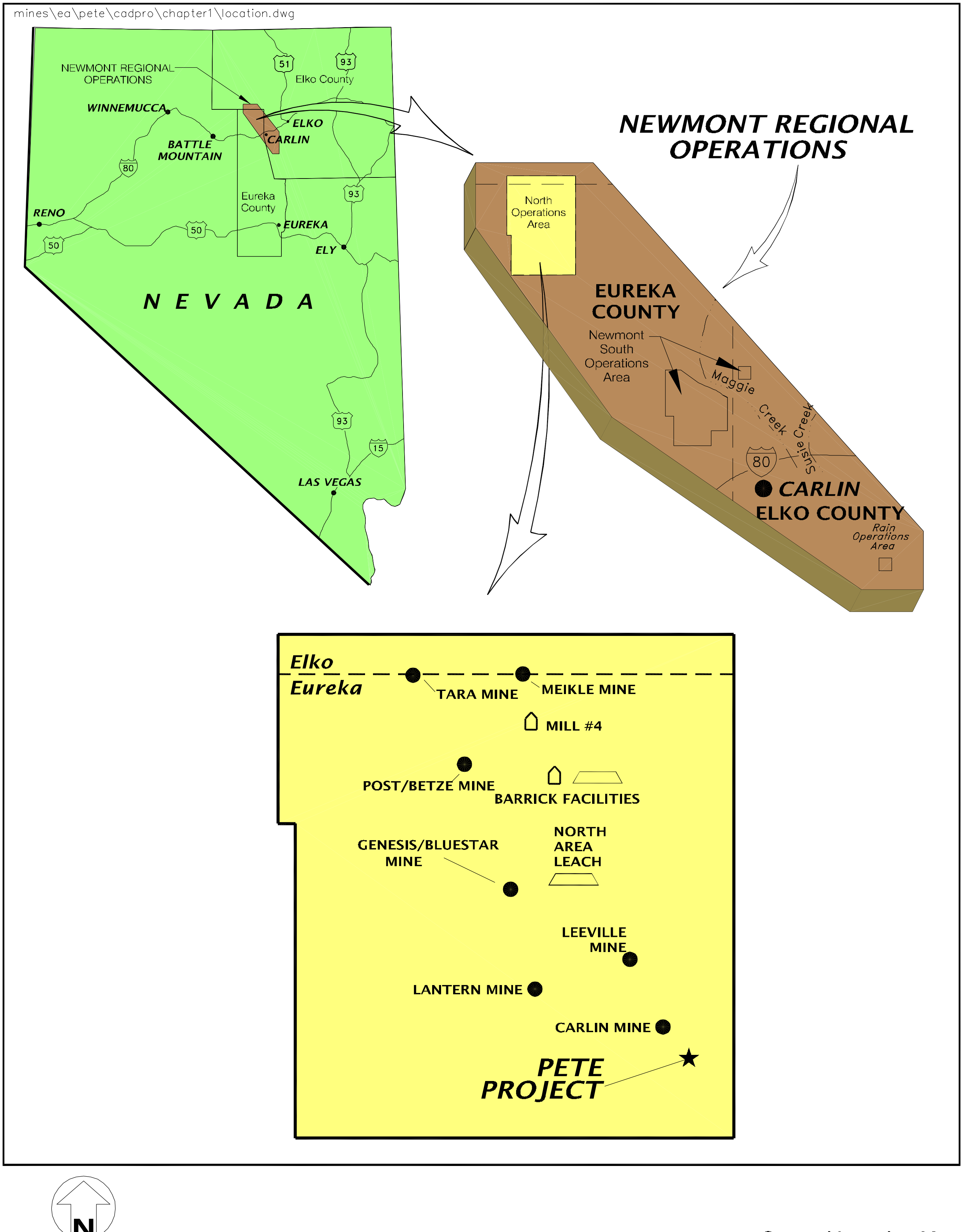
NDEP bonding or "surety" requirements for mine reclamation in Nevada are outlined in Nevada Administrative Code (NAC) 519A.350 - 519A.630 regulations. For BLM, the Surface Management Regulations (43 CFR 3809) establishes bonding policy relating to mining and mineral development.

Newmont estimated the cost of completing reclamation activities described under the Proposed Action including the agency preferred alternative at approximately $2.2 million. A detailed description of the reclamation activities and the schedule for completing reclamation are contained in the Reclamation Plan located in *Newmont Proposed Plan of Operations for the Pete Project, July 2002*. Newmont has submitted the reclamation cost estimate to BLM and NDEP for agency review. Agency review would be completed and the bond amount as determined by BLM and NDEP would be provided in the Decision Record, and no surface disturbing activities would take place until the bond is posted.

In 1990, BLM and NDEP entered into a Memorandum of Understanding (MOU) to coordinate evaluation and approval of reclamation plans for mine developments, and to determine bond amounts for mining and exploration operations. Permit applicants, using industry guidelines and standards for equipment, material, and Davis-Bacon Wage Rates for labor, determine estimated costs of reclamation. These rates are approved by BLM and NDEP in determining the bond amount.

RELATIONSHIP TO BLM AND NON-BLM POLICIES, PLANS, AND PROGRAMS

The Pete Project Plan of Operations has been reviewed for compliance with BLM policies, plans, and programs. The proposal is in conformance with the minerals decisions in the Record of Decision, Elko Resource Area, Resource Management Plan, approved in March 1987. Through the EA process, the State of Nevada and Eureka County are evaluating the proposed Pete Project for conformance with existing land use restrictions.



General Location Map
Pete Project EA
Carlin, Nevada
FIGURE 1-1

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TABLE 1-1 Regulatory Responsibilities	
Authorizing Action	**Regulatory Agency**
Plan of Operations/Rights of Way	Bureau of Land Management (BLM)
National Environmental Policy Act	BLM
National Historic Preservation Act	BLM; Nevada Division of Historic Preservation & Archaeology
Native American Graves Protection & Repatriation Act	BLM
American Indian Religious Freedom Act	BLM
Clean Water Act (Section 404)	U.S. Army Corps of Engineers (USCOE)
High Explosive License/Permit	U.S. Bureau of Alcohol, Tobacco, & Firearms
Industrial Artificial Pond Permit	Nevada Division of Wildlife (NDOW)
Water Appropriation Permits	Nevada State Engineer
Stormwater Permit	Nevada Division of Environmental Protection (NDEP), Bureau of Water Pollution Control
Air Quality Permit	NDEP Bureau of Air Quality
Water Pollution Control Permit	NDEP Bureau of Mining Regulation & Reclamation
Mine Reclamation Permit (and Bonding)	BLM; NDEP Bureau of Mining Regulation & Reclamation
Solid Waste Disposal Permit	NDEP Bureau of Waste Management
Potable Water	Nevada Division of Health (NDH), Department of Human Resources
Sewer System Approvals	NDH, NDEP Bureau of Water Pollution Control
Safety Plan	Mine Safety & Health Administration (MSHA)
Endangered Species Act of 1973	U.S. Fish & Wildlife Service (USFWS)

TABLE 1-2 Issues and Concerns Identified in Scoping	
Issue/Concern	**EA Document Section**
Effects of the Proposed Action on an existing mule deer migration corridor.	Chapter 4 – Terrestrial Wildlife
Effects of the proposed mines on other wildlife such as; sage grouse, chukar, Hungarian partridge, nongame birds, nongame mammals, and furbearers.	Chapter 4 – Terrestrial Wildlife
Effect of the Project on the local economy and employment.	Chapter 4 – Social and Economic Resources
Effects of mine traffic from proposed Pete Project and other nearby mines on wildlife.	Chapter4 – Terrestrial Wildlife

ISSUES

The following issues and concerns were determined by BLM:

- Mule Deer Migration Corridor – impacts to the migration corridor and the effects on mule deer;
- Water Resources – the effect of open pits on groundwater resources;
- Water Quality – impacts on surface and groundwater from mining activities that may release acid rock drainage, heavy metals, trace elements and sediment;
- Threatened, Endangered, and Sensitive Species – species presence; impacts on habitat;
- Wildlife – effects of mining activities on game and nongame habitat and breeding areas;
- Livestock Grazing – effects of mining activity on livestock grazing;
- Air Quality – particulate and gaseous emissions related to mining activity; and
- Soil Quality – impacts on soil quality as it relates to restoring post-mining land uses.

PUBLIC SCOPING

To allow an early and open process for determining the scope of issues and concerns related to the Proposed Action (40 CFR 1510.7), a public scoping period was provided by BLM. On November 19, 2001, BLM mailed a scoping letter that included a Project summary to 135 individuals and organizations listed on the Elko Field Office mailing list. The Plan of Operations was provided on request. Publication of this notice initiated a 30-day public scoping period for the Proposed Action that provided for acceptance of comments through December 24, 2001. Concurrent with these actions, BLM issued a news release to radio stations and news organizations with coverage in the surrounding geographical regions in Nevada, Idaho, California, and Utah. Since the spring of 1999, notification of Newmont's proposed Pete Project has been listed in the Elko Field Office Project and Planning Schedule.

Written responses were received from two agencies and two individuals during the public scoping period. Public and agency comments concerning the Proposed Action are shown in **Table 1-2**. This table also provides references to sections of this EA that respond to each issue raised in the comments.

CHAPTER 2

DESCRIPTION OF PROPOSED ACTION

INTRODUCTION

This chapter describes Newmont's previous operations in the Pete Project area, Newmont's Proposed Action to develop the Pete Project, and reasonable alternatives to the Proposed Action. The proposal to develop ore reserves in multiple deposits located in the Pete Project area are collectively referred to as the Pete Project or the Proposed Action in this document. This amendment would modify the Carlin Plan of Operations (N-70574).

Alternatives considered in the EA are based on issues identified by BLM and comments received during the public scoping process. Alternatives are developed in response to substantive issues identified during scoping and are intended to reduce or minimize potential impacts associated with the Proposed Action that cannot be mitigated by Newmont (Chapter 2) or BLM (Chapter 4).

Detailed discussions of the following topics are presented in this chapter:

- History of mineral exploration and mining in the Carlin Trend and Pete Project area;
- Newmont's previous activities in the Pete Project area;
- Newmont's Proposed Action for the Pete Project; and
- Alternatives to the Proposed Action, including the No Action Alternative and Alternatives Considered but Eliminated from Detailed Analysis.

HISTORY OF EXPLORATION AND MINING

The area of gold mine development in the vicinity of Carlin, Nevada is known as the Carlin Trend (**Figure 1-1**). The Carlin Trend is a linear sequence of gold deposits extending from approximately 10 miles southeast to approximately 40 miles northwest of Carlin. Although the area has been mined for the past 120 years, major mining activity began with development of the Carlin Pit in 1965.

GOLD MINERALIZATION

The following primary geologic occurrences have led to present-day gold mining in the Carlin Trend: 1) deposition and lithification of marine sediments that host the gold mineralization; 2) faulting that disrupted these rocks and created pathways for movement of mineralizing fluids and openings for deposition of gold; 3) deposition of gold from mineralizing fluids associated with igneous activity; and 4) surface erosion that exposed the mineralized rocks.

As gold-bearing fluids migrated upward along faults and fractures, they permeated the disrupted rocks throughout the area. This resulted in widespread dissemination of gold particles and sulfide minerals through large volumes of rock, creating large-tonnage, low-grade gold deposits known to geologists as "Carlin-type" ore bodies. Disseminated gold deposits are typically composed of submicron-sized gold particles often visible only with a scanning electron microscope. Over 20 ore deposits have been identified in the Carlin Trend since exploration for disseminated gold was initiated.

Geologic and mineralization processes have resulted in formation of two disseminated ore types in the Carlin Trend. The uppermost or near-surface ore type is known as oxide ore. This type of ore occurs at shallow depths where oxygenated water percolating through the subsurface has leached sulfide minerals from the rock. The natural leaching process leaves gold in the rock but removes sulfidic minerals.

A second ore type is unoxidized and typically occurs at greater depths at or below the water table where water is low in oxygen. Unoxidized ore is commonly rich in sulfides and can be refractory (i.e., difficult to treat for recovery of precious metals). Refractory ore is further broken down into two subclassifications: 1) silica-sulfide ore, in which gold is locked within sulfide and quartz minerals; and 2) carbon-sulfide ore, in which gold occurs with carbonaceous and sulfidic minerals. Refractory ore is not readily amenable to gold extraction through conventional cyanide leaching; additional processing is required to recover the gold.

MINING IN THE CARLIN TREND

Exploration activities in the Carlin Trend began in the early 1870s with staking of the Good Hope claims in the Maggie Creek district (Coope 1991). These claims produced mainly lead and silver, with minor amounts of barite and gold. The first significant gold discovery was made on Lynn Creek in 1907, approximately 1.5 miles north of the present Carlin Mine. Placer gold discoveries followed in Sheep, Rodeo, and Simon creeks.

Newmont initiated its mining activities in the North Operations Area at the Carlin open-pit mine in 1965. Newmont's North Operations Area includes all of Newmont's mining operations located between the Carlin and Bootstrap Mines. Mining at the Bootstrap open-pit mine began in 1974 and continued until 1984; closure and reclamation activities were completed in 1988. In 1986, Newmont began mining the Blue Star/Genesis open-pit mines within the Blue Star Operations Area. In 1988, Newmont constructed and initiated operations at the Mill #4 process facilities and North Area Leach Facilities. In 1994, Newmont re-initiated mining at the Bootstrap open-pit mine, developing the Capstone and Tara ore bodies.

From 1979 to 1982, the Bullion Monarch open-pit mine was operated by Universal Gas. Process facilities for this operation consisted of a mill and associated tailing impoundment. The mill facilities at this site were demolished during 1992 and 1993. The Bullion Monarch open-pit and mill facilities were located in the W½, Section 10, T35N, R50E.

Polar Resources began mining operations at the Goldstrike Mine in 1974; after several different owners, this mine was acquired by American Barrick Resources in 1986 and subsequently became the Betze/Post open pit mine (McFarlane 1991). Barrick began development of the Meikle underground mine (located immediately north of the Betze/Post Mine) in 1995, with processing of ore at the Betze/Post operations.

In 1992, Newmont began exploration on the High Desert (also known as HD Venture) Exploration Project, located in Sections 2, 10, 11, 12, T35N, R50E and Section 18, T35N, R51E. In 1993, Newmont began exploration on the Chevas Exploration Project, which is located in Sections 1, 2, 3, T35N, R50E and Section 7, T35N, R51E. Exploration activities within these two projects consisted of mapping, drilling, and trenching.

ORE PROCESSING IN THE CARLIN TREND

Newmont and Barrick Goldstrike Mines, Inc. (Barrick) operate open-pit and underground mines and process ore using both milling and heap leach facilities in the Carlin Trend. Newmont operates mines and ore processing facilities at the following locations: Rain Operations Area, approximately 10 miles southeast of Carlin; South Operations Area, 6 miles northwest of Carlin; and North Operations Area, approximately 21 miles northwest of Carlin. Barrick's operations include the Betze/Post Mine, located adjacent to Newmont's North Operations Area, and the Meikle Mine, located immediately north of Betze/Post Mine.

Early ore processing in the Carlin Trend relied on milling and vat leaching to recover gold from high-grade ore. Vat leaching involved grinding rock to a fine sandy texture (milling) and mixing the ground rock with cyanide solution in tanks for removal of gold (vat leaching). Oxidized ore, low in carbon, could be directly leached, while unoxidized carbonaceous ore was treated with chlorine prior to extraction. Milling methods continue to be economically viable for richer ores, but are generally not cost-effective for low-grade deposits.

Development of heap leaching for gold recovery from low-grade oxide ore began in the 1970s, allowing further expansion of the regional mining industry. Heap leaching involves placing low-grade oxide ore in large heaps and sprinkling the heaps with a weak cyanide solution. The cyanide solution percolates through the heaps, dissolving gold from the ore. The heaps are lined with impervious materials and are designed to collect and channel gold-bearing solution to holding ponds. Gold is removed from the cyanide solution by adsorption to carbon. The carbon is then processed to remove the gold, which is shipped to specialty smelters for further refinement.

Effectiveness of cyanide leaching is decreased by the presence of carbonaceous material or sulfide in the ore. Sulfide selectively absorbs the cyanide and can encapsulate gold particles. Natural carbon in the ore adsorbs the gold from the cyanide solution. For this reason, mining in the Carlin Trend during the early 1980s focused on near-surface oxidized rock amenable to heap leaching. Deeper ores containing sulfide or carbonaceous material require milling and refractory ore processing, which is more expensive than heap leaching. Limited mining and stockpiling of deeper sulfidic or carbonaceous ores occurred in the mid- to late 1980s.

In the late 1980s, as new processes were being developed to treat refractory ores in the Carlin Trend, geologists discovered relatively rich gold deposits at greater depth where oxidation of sulfide minerals had not taken place. Geologically, these deep-sulfide refractory ores typically occur in feeder zones through which original mineralizing fluids migrated to permeate upper host rocks. These deep feeder zones typically have a richer gold content than the near-surface ore, but they lie below the depth of natural oxidation. Extraction of this ore often requires mining below the water table.

In recent years, techniques have been developed to economically recover gold from both sulfide and sulfidic-carbonaceous refractory ores. Refractory processing methods involve artificially oxidizing the sulfide and carbonaceous material in the ore prior to conventional cyanide extraction. Artificial oxidation is accomplished by heating ore in an oxygen-rich environment (roasting) or adding high pressure to the roasting process (autoclave). Because both of these methods require large amounts of electrical or gas energy, efforts are underway to develop biological or less expensive chemical processes to oxidize the ore. Currently, Newmont's only bioleach processing facility is located at the South Operations Area. Presently, however, thermal methods are the only ones used for processing refractory ores in the Carlin Trend. Once the ore has been oxidized naturally or artificially, gold is recovered through cyanide extraction.

PREVIOUS AND CURRENT OPERATIONS

LOCATION AND LAND OWNERSHIP

The Pete Project is located on the eastern slope of the Tuscarora Mountains in the Maggie Creek Basin, and includes portions of Sections 13 and 24, T35N, R50E, M.D.M and Sections 19, 29, and 30, T35N, R51E, M.D.M. With the exception of an ore stockpile facility, the proposed Project would be located within the Carlin Plan of Operations (N-70574) issued in 1981 by BLM.

Geologic evaluations on public land, including exploration access roads, drill pads, and trenches, in the vicinity of the Pete Project were reviewed under the Newmont Gold Company Carlin Exploration Project Environmental Assessment No. BLM/EK/PL-96/017.

Currently, 208 acres of public land and 297 acres of private (Newmont) land are permitted for exploration disturbance within the Carlin Plan boundary. These areas will be reclaimed in accordance with the Carlin Operations Area Reclamation Plan. The proposed Pete Project amendment does not change currently permitted exploration activities within the Carlin Operations Area. Applications to conduct future geologic evaluation on public land including surface disturbance for exploration access roads, drill pads, and trenches in the vicinity of the Pete Project would be submitted under amendments to the Carlin Operations Area Plan.

Previous and ongoing mining operations occur in the Carlin Operations Area located on the divide separating Boulder Creek and Maggie Creek drainage basins in Tuscarora Mountains. Open pit and underground mining, ore milling, and waste rock disposal have occurred within the Carlin Operations Area which includes portions of Sections 11, 13, 14, 15, 23, and 24, T35N, R50E, M.D.M. and Sections 19 and 30, T35N, R51E, M.D.M. Pete Project is located adjacent to the Carlin Southeast Waste Rock Facility.

PROPOSED ACTION

In July 1999, Newmont submitted an amendment to the Carlin Operations Area Plan of Operations (Plan) for the Pete Project to BLM. The Plan of Operations for the Pete Project was revised in August 2001 and includes description of the following proposed activities:

- Developing and operating three open pit mines – Pete, Castle Reef, and Crow;
- Constructing the Pete South Waste Rock Disposal Facility;
- Developing a refractory ore stockpile;
- Constructing ancillary facilities; and,
- Reclaiming areas disturbed by mining activities.

Surface and mineral ownership within the Pete Project area is shown on **Figure 2-1**. Total area of proposed disturbance for the Pete Project would be approximately 863 acres, which includes 520 acres of public land and 343 acres of private land. The proposed disturbance area encompasses 171 acres of existing permitted disturbance associated with exploration activity at Pete (101 acres public land and 70 acres private land) authorized under the Carlin Plan of Operations (N-70574).

Proposed disturbance areas and acres are shown on **Figure 2-2** and in **Table 2-1**. Under current operating plans and projections, Newmont anticipates the Pete Project to have a mine life of seven years.

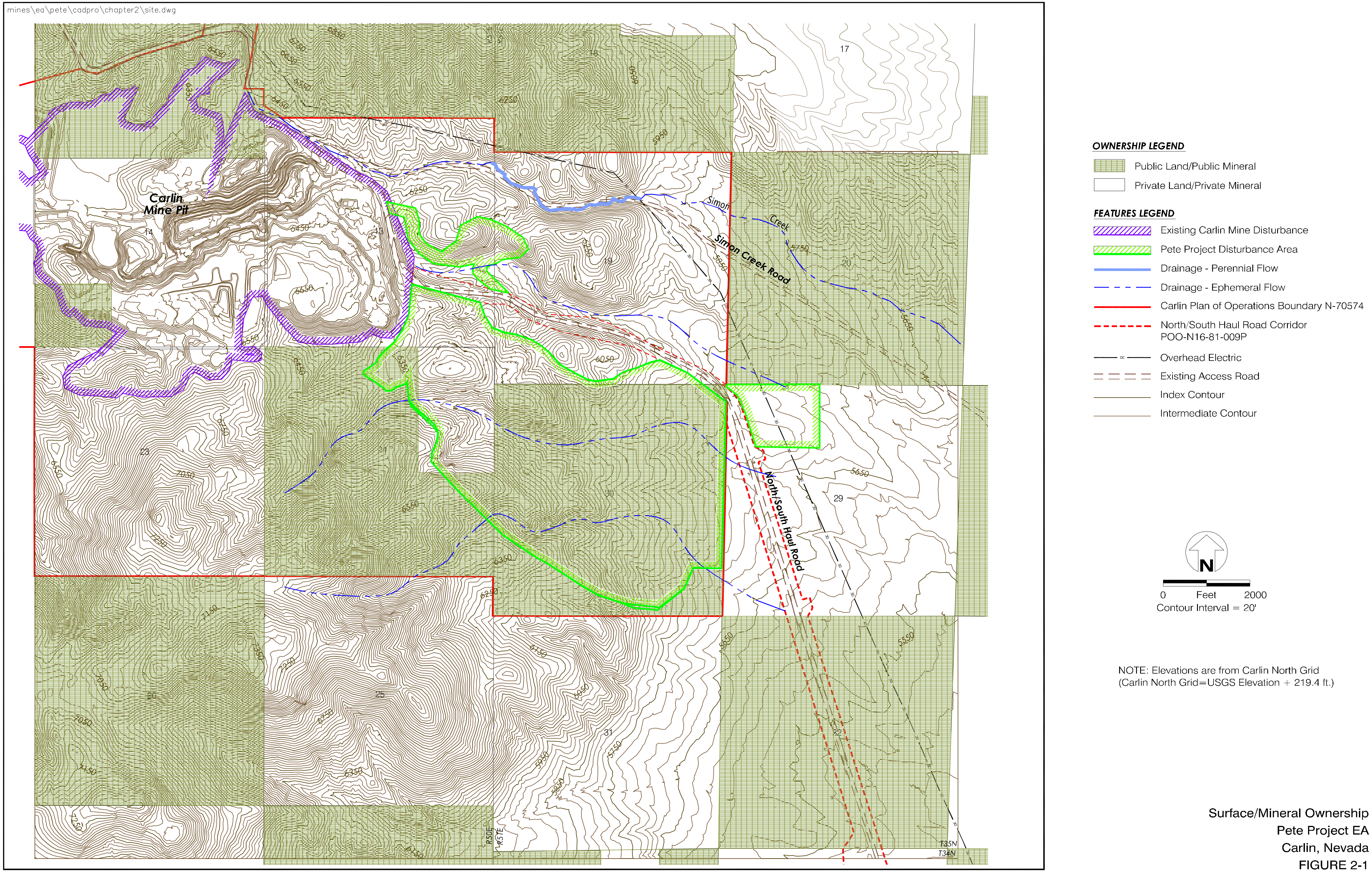
These components of Newmont's Plan of Operations for the Pete Project constitute the Proposed Action analyzed in this EA. The Proposed Action referred to throughout the EA is Newmont's Amended Plan of Operations for the Pete Project.

MINING OPERATIONS

Newmont proposes to remove ore and waste rock from three open pit mines identified as Pete, Castle Reef, and Crow. Collectively, these three mines and a waste rock disposal facility comprise the Pete Project. None of the proposed mine pits would require dewatering. Production from each of these mine pits would include oxide and refractory type ore. Oxide ore would be processed at the existing North Operations Area Leach facility. Existing leach piles and tailing facilities located in the North Operations Area are adequately sized to accommodate oxide ore produced from the Pete Project. Refractory ore produced from the Pete Project would be processed at existing Mill 5/6, located in Newmont's South Operations Area.

Ore and waste rock would be drilled and blasted in sequential benches to facilitate loading and hauling. Blasted ore and waste rock would be loaded into off-road, end-dump haul trucks using shovels and front-end loaders. Within each mine, benches would be established at approximately 20-foot vertical intervals with bench widths varying to include safety berms and haul roads. Haul trucks would move within the pit(s) using roads on the surface of benches with ramps extending between two or more benches.

Drill cuttings would be collected during blasthole drilling and analyzed to determine gold content and metallurgical and waste rock characteristics. The material would then be loaded into haul trucks for transportation to either the waste rock disposal facility, ore stockpiles, or ore processing facilities.



Surface/Mineral Ownership
Pete Project EA
Carlin, Nevada
FIGURE 2-1

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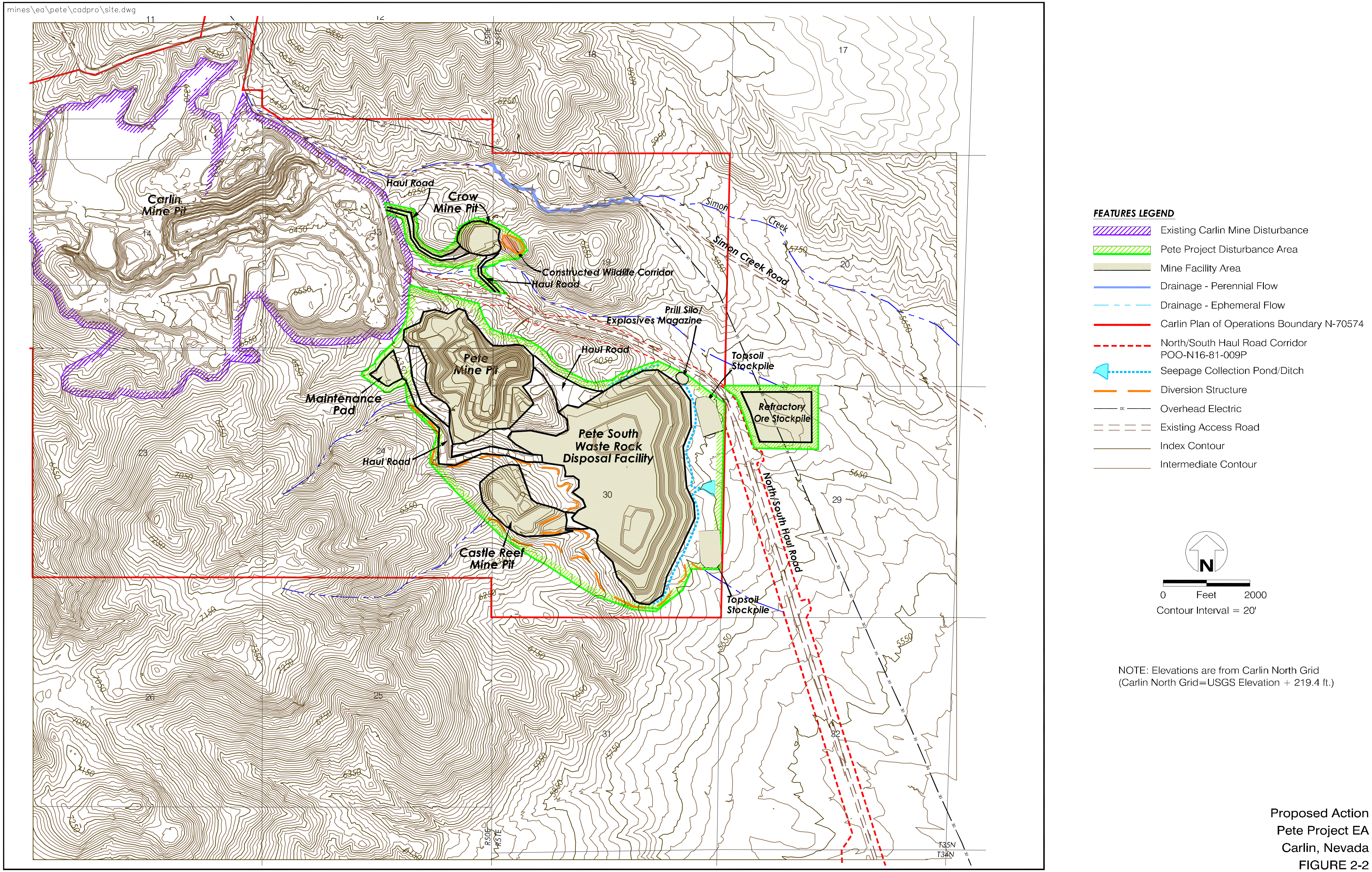

Proposed Action
Pete Project EA
Carlin, Nevada
FIGURE 2-2

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Pete Mine

Excavation of the Pete Mine pit would disturb approximately 190 acres of private land and 33 acres of public land located in Section 30, T35N, R51E. The pit would extend approximately 640-feet below existing ground surface and measure 3,000 feet along the northwest to southeast axis and 2,400 feet in width. Elevation of the proposed pit bottom would be 5,530 feet above mean sea level (amsl). Approximately 77 million tons of material would be removed over the 7-year life-of-mine including 2.4 million tons of ore and 74.6 million tons of waste rock. Projected production rates for the Pete Mine are shown in **Table 2-2.**

TABLE 2-1
Proposed Pete Project Disturbance Areas

Facility	Public Land	Private Land	Total
Pete Pit	33.4	190	223.4
Castle Reef Pit	40.2	0	40.2
Crow Pit	0	38.2	38.2
Pete South Waste Rock Disposal Facility	408.5	27.2	435.7
Haul and Access Roads	0	27.2	27.2
Fuel/Maintenance Area	13.6	0	13.6
Topsoil Stockpiles	24	0	24
Refractory Ore Stockpile	0	57.6	57.6
Prill Silo/Explosive Magazine	0	3	3
Geologic Evaluations[1]	0	0	0
Total Disturbance	**519.7**	**343.2**	**862.9**

[1] Proposed Pete Facilities encompass approximately 171 acres of existing geologic evaluation disturbance (101 acres public land and 70 acres private land). No change to the permitted disturbance is proposed.
Source: Newmont 2001a.

TABLE 2-2
Projected Pete Project Production (ktons)[1]

Rock Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Total
Pete Mine								
Oxide Waste	116.728	3903.096	11225.276	17483.187	17982.239	15635.544	2194.048	68540.118
RSW[2]	18.988	76.121	114.521	514.561	2300.952	3128.478	0.749	6154.37
Oxide Leach Ore	0.010	153.747	119.692	205.799	60.675	19.760	0.000	559.683
Oxide Mill Ore	0.000	31.630	14.930	22.281	6.468	2.220	0.000	77.529
BioMill Ore	0.001	15.454	7.218	1.061	13.938	10.410	0.000	48.082
Ref Mill	0.000	9.975	45.083	245.400	245.140	860.845	300.068	1706.511
Total	135.727	4190.023	11526.72	18472.289	20609.412	19657.257	2494.865	77086.293
Crow Mine								
Oxide Waste			15.831	29.676				45.507
RSW			2980.268	3714.578				6694.846
Oxide Leach Ore			3.597	1.799				5.396
Oxide Mill Ore			0.000	0.000				0.0
BioMill Ore			0.000	26.723				26.723
Ref Mill			0.000	185.019				185.019
Total			2999.696	3957.795				6957.491
Castle Reef								
Oxide Waste						984.585	934.875	1919.46
RSW						0.000	0.000	0.0
Oxide Leach Ore						425.029	813.748	1238.777
Oxide Mill Ore						0.000	0.000	0.0
BioMill Ore						0.000	0.000	0.0
Ref Mill						0.000	0.000	0.0
Total						1409.614	1748.623	3158.237
Total Ox Waste	116.728	3903.096	11241.107	17512.863	17982.239	16620.129	3128.923	70505.085
Total RSW	18.988	76.121	3094.789	4229.139	2300.952	3128.478	0.749	12,849.216
Total Ore	0.011	210.806	190.52	688.082	326.221	1318.264	1113.816	3847.72
Total Material	135.727	4190.023	14526.416	22430.084	20609.412	21066.871	4243.488	87202.021

[1] ktons = 1,000 tons.
[2] RSW = Refractory Sulfide Waste
Ref = refractory
Source: Newmont 2001a

Castle Reef Mine

Development of the Castle Reef Mine pit would disturb approximately 40 acres, all on public land, in Section 30, T35N, R51E. The pit would extend approximately 1,700 feet north to south, 2,300 feet east to west, and 240-feet below existing ground surface. The proposed pit bottom is projected at about 5,950 feet amsl. Combined production at the mine would total 3.1 million tons of rock (1.2 million tons of ore and 1.9 million tons waste rock). Projected production rates for the Castle Reef Mine are shown in **Table 2-2.**

Crow Mine

The Crow Mine would disturb approximately 38 acres of private land in Section 13, T35N, R50E. Approximate dimensions of the pit would be 1,000 feet north to south, 1,200 feet east to west, and would extend 440-feet below existing ground surface. Elevation of the proposed pit bottom would be 5,710 feet amsl. The Crow Mine would produce approximately 7 million tons of ore and waste rock (0.3 million tons ore and 6.7 million tons waste rock). Estimated production rates for the Crow Mine are shown in **Table 2-2.** During development of the Crow pit, Newmont would avoid constructing the access/haul road over seep/spring SP-72.

Mine Pit Dewatering

A mine pit dewatering program would not be necessary for development of the Pete, Castle Reef, and Crow mine pits. The designed pit bottoms for all three proposed pits would be at elevations above the current and pre-mine groundwater elevations for bedrock in the Project area. The regional potentiometric surface in carbonate bedrock has been lowered due to mine dewatering in the Carlin Trend. Mines with active dewatering systems include Barrick Goldstrike's Betze/Post Mine and Meikle Mine, and Newmont's Gold Quarry Mine. Groundwater monitoring data suggest a pre-dewatering water elevation in carbonates in the Pete Project area of approximately 5,270 feet amsl (Newmont 2001a). Based on these data, the fully recovered water elevation in carbonates would be about 250 feet below the lowest elevation (5,530 feet amsl) of the proposed mine pits.

During mine operations, groundwater entering the Pete Project mine pits from isolated perched water zones in Lower Plate rocks is expected to be minor and short-term (see *Water Quantity and Quality* sections in Chapters 3 and 4). Groundwater inflow into the mine pits during operations would be channeled to in-pit sumps and removed for dust suppression or other operational uses.

Waste Rock Disposal Facility

Development of three open-pit mines would require construction of a new waste rock disposal facility. The Pete South Waste Rock Disposal Facility would be constructed on 408 acres of public land in Section 30, T35N, R51E. Approximate dimensions of the proposed facility would be 5,200 feet north to south, 3,200 feet east to west, and extending up to 300 feet above existing ground surface. The waste rock disposal facility would be engineered for stability and designed, where practicable, with boundaries to blend with surrounding topography. The Pete South Waste Rock Disposal Facility would be constructed on a base of compacted, low permeability materials, designed to prevent vertical migration of fluids and sloped to allow drainage to a collection pond. The low permeability base would be constructed incrementally during years 2, 3, and 4, as waste rock placement proceeds. French drains would be constructed to allow for flow from seeps that would be covered by the waste rock disposal facility. French drains would be constructed of minimum 12-inch diameter (acid-neutralizing) waste rock, a non-woven geotextile fabric placed over the rock, covered with 2-feet of low permeability materials, and compacted. Newmont would avoid placing waste rock over seep/springs SP-2 and SP-56. The top of the waste rock disposal facility and remaining benches would be graded to promote run-off of water (free draining), prevent ponding or impounding of water, and prevent erosion.

Ditches would be constructed around the base, sides, and upslope position (**Figure 2-2**) of the facility to divert surface water runoff away from the area. Precipitation infiltrating through the waste rock would be captured in the collection pond for sampling and sediment control. The collection pond would be sized to hold approximately 8.3 acre feet of solution. Most water draining to the collection pond would be lost to evaporation. Excess water would be transported to the North Area leach process pond for disposal.

Permanent diversion ditches would be constructed around the Pete and Castle Reef pits to divert flow from ephemeral drainages up-gradient of the two pits. The ditches would be routed around the pits to a point in the undisturbed portion of the existing drainage down-gradient of the Pete South Waste Rock Disposal Facility (**Figure 2-2**).

The crest of the waste rock disposal facility would not exceed the elevation of the highest surrounding natural topography. The facility would contain approximately 83 million tons of waste rock (**Table 2-2**). Construction of the waste rock disposal facility would be in accordance with Newmont's Refractory Ore Stockpile and Waste Rock Dump Design, Construction, and Monitoring Plan (Newmont 1995/1997). This plan provides general information on operational classification of waste rock, including sampling and routing plans, and details the designs for managing potentially acid generating waste rock and refractory ore at all of Newmont's operations.

Newmont would sample, test, and classify waste rock during operations in accordance with the Nevada Division of Environmental Protection (NDEP) Waste Rock and Overburden Evaluation guidelines, to verify the initial environmental geochemistry assessment. These data would be used to determine if preliminary analyses adequately represent the geochemistry of mined materials and/or release metals. All blastholes would be mapped by Newmont to identify carbon and sulfide content. Every third hole would be analyzed for total carbon, acid insoluble carbon, total sulfur, and sulfur roast.

Ore Stockpile and Ore Processing

Approximately 1.8 million tons of oxide leach-grade ore would be excavated from the Pete Project and hauled via the North-South Haul Road to the existing North Operations Leach Facility. A small amount (77,000 tons) of oxide mill-grade ore would be transported to Newmont's South Operations Area Mill 5/6 for processing. A total of approximately 1.9 million tons of refractory ore would be excavated through development of the three Pete Project mine pits. Ore would be directly hauled to Newmont's South Operations Mill 5/6, or temporarily stockpiled in a refractory ore stockpile located on approximately 58 acres of private land in Section 29, T35N, R51E **(Figure 2-2)**. This ore would be transported from the stockpile to the South Operations Area using 120- to 190-ton trucks. Haulage of refractory ore to the South Operations Area would be via the existing North-South Haul Road.

Refractory ore would be processed through Mill 5/6 and tailing would be disposed of in Tailing Storage Facility 5/6. Modification or expansion of the tailing storage facility beyond the current authorized capacity would not be required to process ore from the Pete Project.

Construction of a refractory ore stockpile would be in accordance with Newmont's Refractory Ore Stockpile and Waste Rock Dump Design, Construction, and Monitoring Plan (Newmont 1995/1997). The refractory ore stockpile would be built on a low permeability base compacted and sloped to allow drainage to a collection point. Ditches would be constructed around the base of the stockpile to divert surface runoff away from the area.

Any precipitation that infiltrates through the pile would be captured in a collection area for sampling and sediment control. Majority of water draining to the collection area would be lost to evaporation. Depending on water quality, excess water would be hauled to the North Area Leach Facility. Refractory ore stockpiles are described in more detail in Newmont's Refractory Ore Stockpile and Waste Rock Dump Design, Construction, and Monitoring Plan (Newmont 1995/1997).

Inspection of the refractory ore stockpile would be performed quarterly and following heavy spring snow melt or precipitation events, to detect abnormal conditions, anticipate remedial actions, and ensure integrity of ditches, berms, and collection ponds. Rock analyses are included in permit-mandated Water Pollution Control Reports for the facility.

Haulage of oxide and refractory ore from Pete Project mines to the North and/or South Operations Area would not increase traffic on the North-South Haul Road. Newmont anticipates truck haulage from Leeville and Pete projects would come on line about the time other North Area hauling operations (Betze/Post) are winding down. Haulage of up to

16.5 million tons of refractory ore to Mill 5/6 via the North-South Haul Road was analyzed by BLM as part of the South Operations Area Project EIS and Record of Decision (BLM 1993).

Mule Deer Migration Route

Newmont in consultation with BLM and Nevada Division of Wildlife (NDOW), has attempted to develop a means to provide continued use of an existing mule deer migration route through the proposed Pete Project area. (Refer to *Terrestrial Wildlife* section in Chapter 3 for a description of existing mule deer migration routes). **Figure 2-3** illustrates the existing mule deer migration route in relation to the proposed Crow pit.

Prior to commencing operations at Crow pit, Newmont would construct a permanent wildlife corridor around the east side of Crow pit prior to October 31, 2002 (**Figure 2-4**). The corridor would accommodate mule deer migration through the area while mining of Crow pit occurs during years 3 and 4. The wildlife corridor would consist of a bench approximately 70 feet wide by 300 feet in length. **Figure 2-5** is a cross section of the constructed wildlife corridor. Slopes would be constructed to 3H:1V (horizontal to vertical) and seeded with appropriate vegetation species as determined by NDOW and BLM. **Figure 2-6** depicts the ultimate pit development at Crow Mine. Upon completion of mining, Crow pit would be partially backfilled with waste rock from the Pete pit to an approximate elevation of 6,070 feet (**Figures 2-7** and **2-8**). Backfill material would be placed to match the migration corridor entry to the Crow pit and to eliminate any benches associated with mining on the east side of the Crow pit (see **Figure 2-8**). During mining of Crow pit, access to the constructed wildlife corridor would be restricted to reclamation/ seeding activities. No construction would occur in the wildlife corridor near Crow pit between November and May to avoid deer and heavy equipment interaction during the peak migration period.

The Pete South Waste Rock Disposal Facility would be constructed in phases that would result in an unobstructed corridor through the Pete Project area during seasonal migration. Slopes would range from 2.5 to 3H:1V as each lift is completed. No cut slopes are planned and any that may be needed would be flattened to accommodate wildlife movement. Access ramps would be constructed on the north and south sides of the waste rock disposal facility to facilitate wildlife movement. The Pete South Waste Rock Disposal Facility would be reclaimed concurrently to a 3H:1V slope to facilitate deer migration through the area. Newmont would eliminate barriers to north-south wildlife movement during the migration period. NDOW would inspect the corridor annually during August to allow time for corrections or alterations prior to the migration period.

Where the North-South Haul Road passes through Section 19, T35N R51E, existing 3 to 5 foot wide gaps would be maintained at 50-yard intervals to allow migrating mule deer to cross the haul road. Mule deer would then proceed along the Pete South Waste Rock Disposal facility as described above.

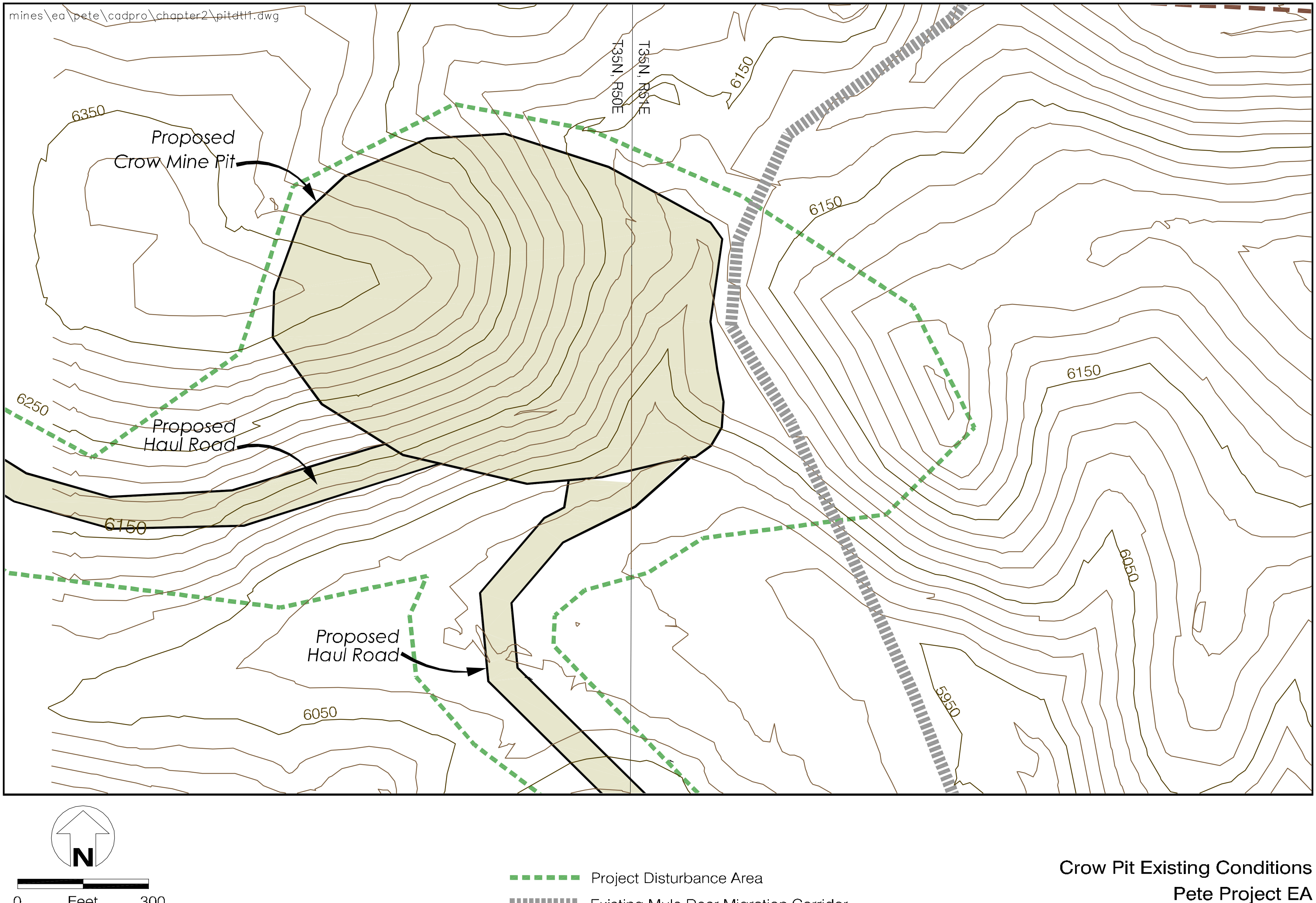
Haul and Access Roads

Development and operation of the Pete Project would require approximately 27 acres of disturbance on private land for construction of haul roads. Proposed haul roads would be 120-feet wide (running width) to safely accommodate haul truck traffic with a maximum gradient of 10 percent. Haul roads would be maintained on a continuous basis to ensure safe, efficient haulage operations and to minimize fugitive dust emissions. Haul roads would be constructed using in-situ material; however, oxide or neutral mine waste rock may be used, as necessary, for construction or routine maintenance. Access roads would be constructed to an average width of 35-feet using in-situ materials and waste rock similar to haul roads.

ANCILLARY FACILITIES

Ancillary facilities at the Pete Project would include an equipment fueling and maintenance area, topsoil stockpiles, Prill silo/explosives magazine, and storm water control facilities. These facilities are shown on **Figure 2-2**.

An equipment fueling and maintenance area would be constructed on a level area on the westside of the Pete pit. Approximately 20,000



Project Disturbance Area

Existing Mule Deer Migration Corridor

Crow Pit Existing Conditions
Pete Project EA
Carlin, Nevada
FIGURE 2-3

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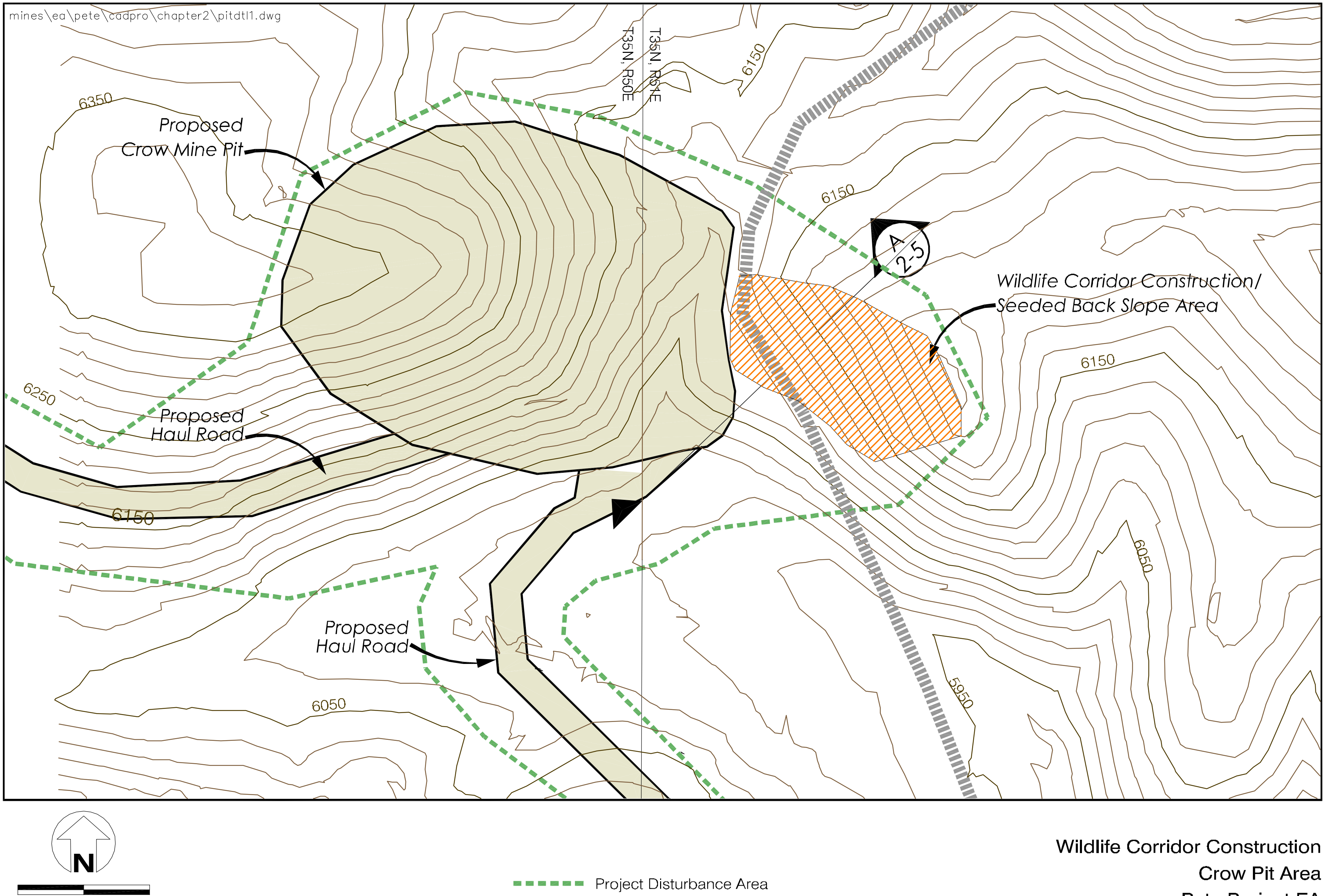

Project Disturbance Area

Existing Mule Deer Migration Corridor

Wildlife Corridor Construction

Crow Pit Area

Pete Project EA

Carlin, Nevada

FIGURE 2-4

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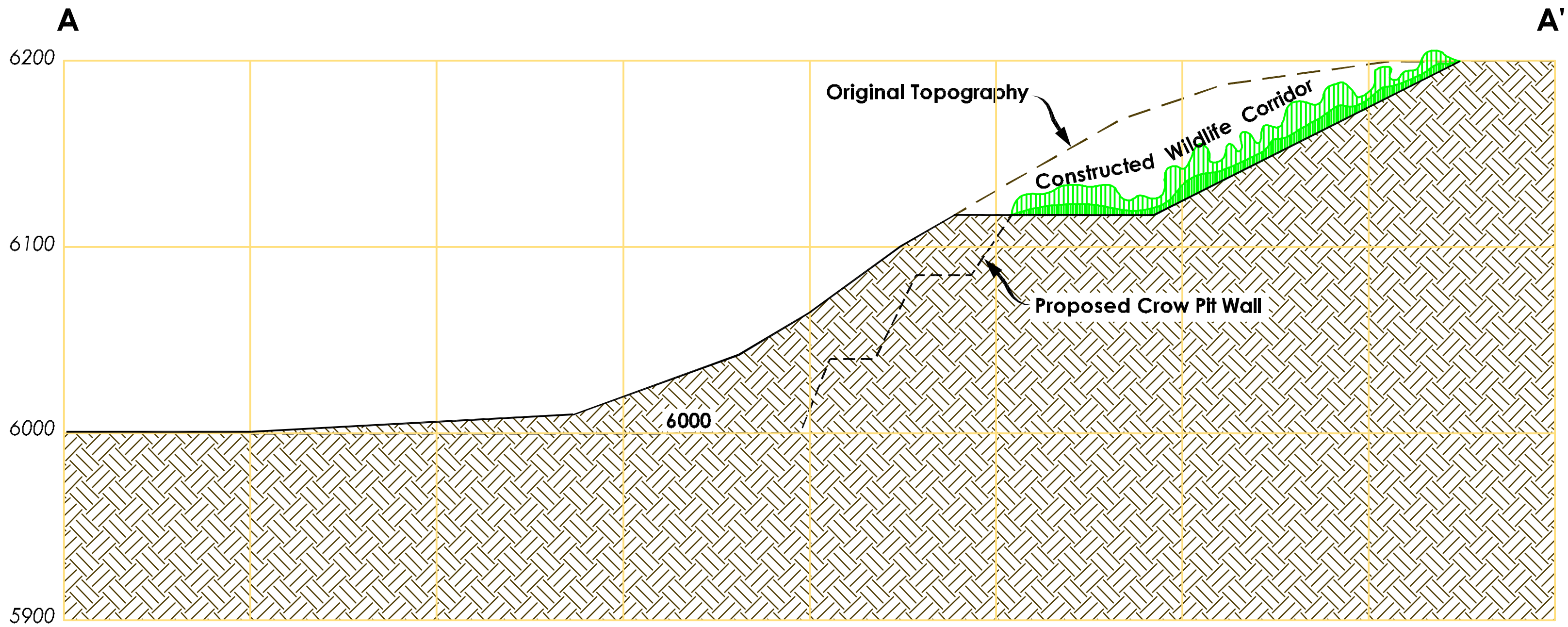

Section A-A' Crow Pit Wildlife Corridor
Pete Project EA
Carlin, Nevada
FIGURE 2-5

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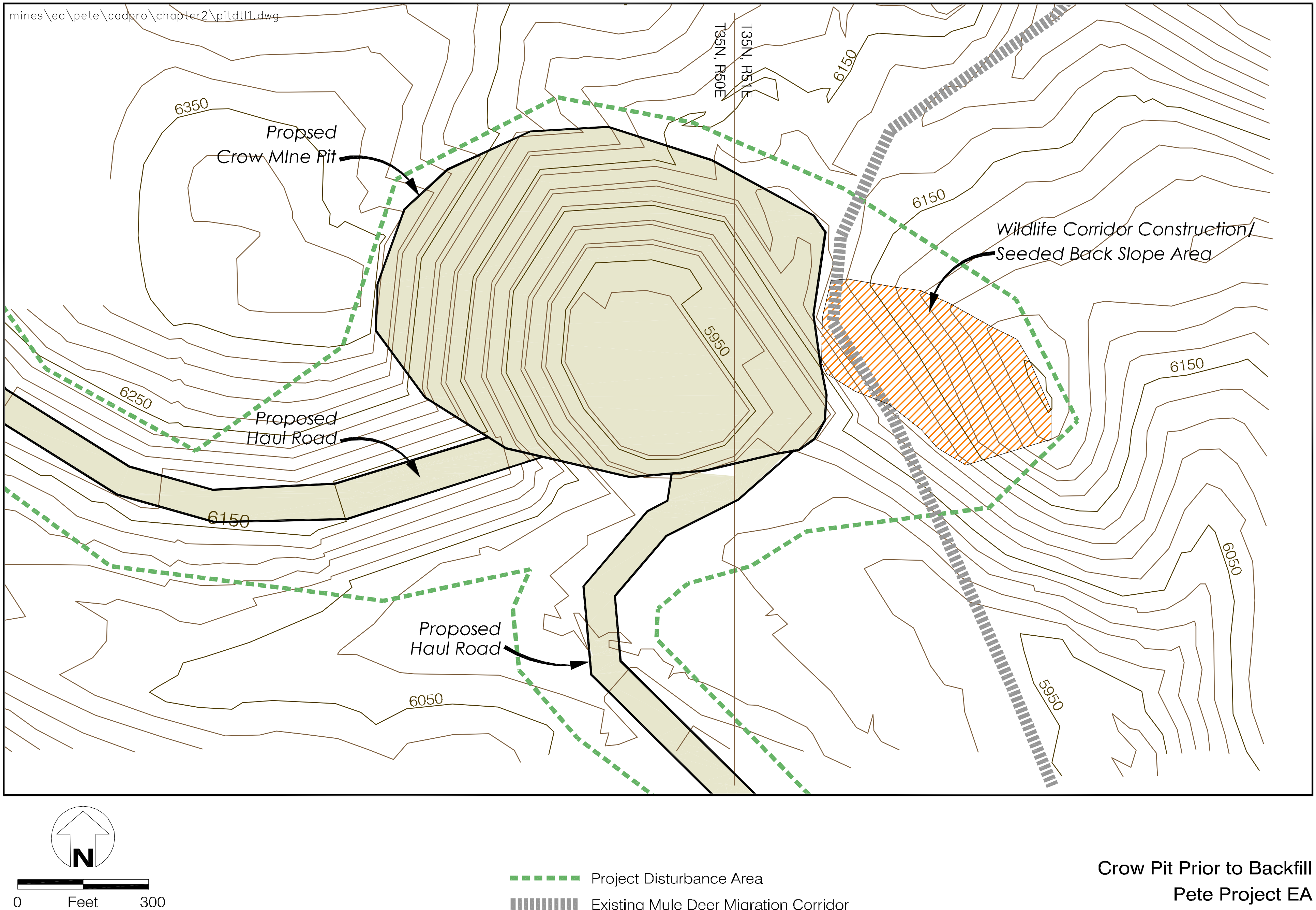

Crow Pit Prior to Backfill
Pete Project EA
Carlin, Nevada
FIGURE 2-6

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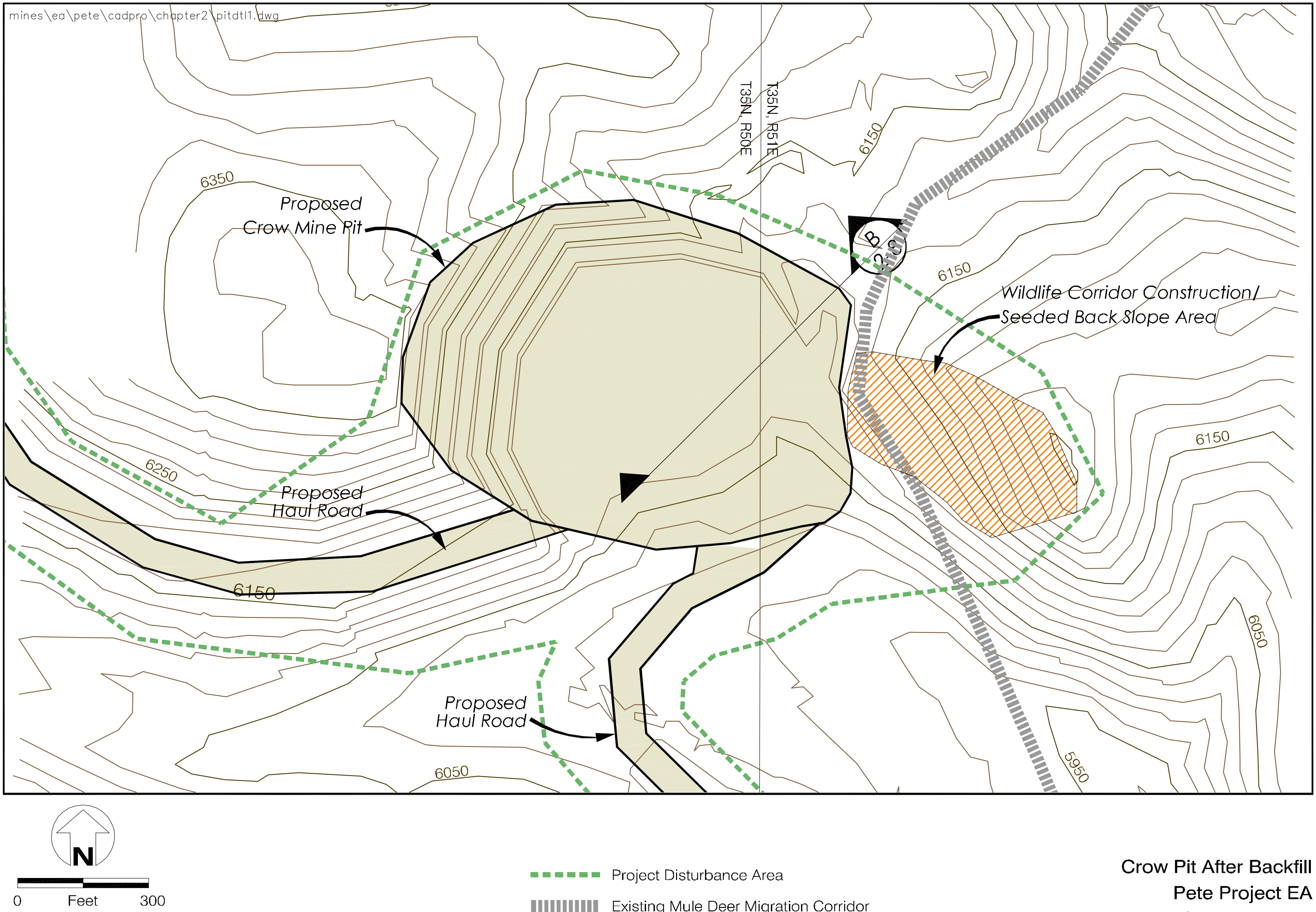

Project Disturbance Area

Existing Mule Deer Migration Corridor

Crow Pit After Backfill
Pete Project EA
Carlin, Nevada
FIGURE 2-7

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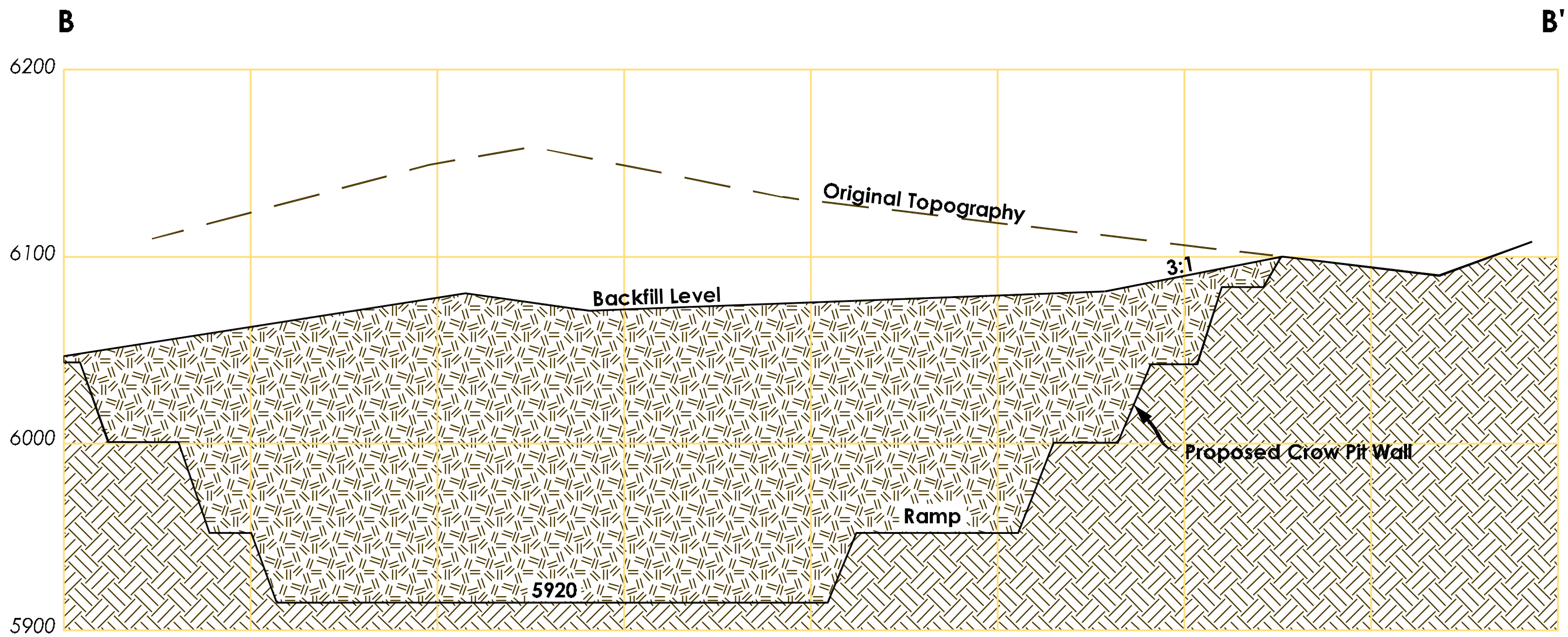

Section B-B' Crow Pit Backfill
Pete Project EA
Carlin, Nevada
FIGURE 2-8

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gallons of diesel fuel would be stored on-site in aboveground storage tanks. A lined spill containment basin would be constructed around bulk storage tanks to contain 110 percent of the volume of the largest tank. The area would encompass approximately 13.6 acres of public land in Section 24, T35N, R50E. Engineering response procedures and spill cleanup would be conducted in accordance with Newmont's Emergency Response Plan (Newmont 2001b). A Prill silo and explosives magazine would be located on approximately 3 acres of private land near the northeast corner of the Pete South Waste Rock Disposal Facility in Section 19, T35N, R51E (**Figure 2-2**).

Approximately 24 acres of public land and 5 acres of private land would be necessary for storage of topsoil resources salvaged from the Pete Project development. Topsoil would be stockpiled for future use in reclaiming disturbed areas. Locations of proposed topsoil stockpiles are shown on **Figure 2-2.**

Newmont would construct berms and ditches as appropriate to preclude meteoric water from flowing into mine pits, or onto the waste rock disposal facility, or refractory ore stockpile. Sediment control structures would include silt traps and fences using straw, hay bales, or geotextile fabric, and sediment ponds. Newmont would maintain these structures throughout the life of the mine.

GEOLOGIC EVALUATIONS

Newmont proposes to continue geologic evaluations (gold exploration) within the Pete Project area during the life of the Project under the previously approved Carlin Plan of Operations (N-70574). Geologic evaluation activities would include exploration and development drilling, geochemical sampling, excavation of test pits, trenching, and application of various geophysical methods. Surface disturbance created by drilling operations would consist of construction of roads, drill pads, and sumps. These activities would be conducted in accordance with applicable BLM and NDEP regulations. Exploration activity would not occur within the mule deer migration corridor from November to April.

RESOURCE MONITORING

Air Quality

Fugitive dust emissions would be controlled using Best Management Practices (BMPs) as outlined in the Handbook of Best Management Practices (Nevada State Conservation Comm. 1994). Dust emissions would be controlled through use of direct water application, chemical binders or wetting agents, and revegetation of disturbed areas concurrent with operations.

Water Resources

Newmont would amend the North Operations Area Storm Water Pollution Prevention Plan approved under Storm Water General Discharge Permit No. GNV0022225-10014 to include the Pete Project development. Stormwater would be controlled using BMPs as defined by the Nevada State Conservation Commission (1994) and include material handling procedures that minimize exposure of materials to stormwater; spill prevention and response measures; sediment and erosion control; and physical stormwater controls. Stormwater run-on would be controlled by construction of interceptor ditches upgradient of surface facilities.

Water resources in the Pete Project area are monitored within the Boulder Flat and Maggie Creek hydrographic basins as part of Barrick's and Newmont's approved Plans of Operations. The current monitoring program addresses groundwater, springs/seeps, and streams/rivers. The purpose of hydrologic monitoring is to establish baseline data and report changing conditions as mining operations continue and expand in the area. Water quality, water table elevations, and/or flow rates are measured monthly, quarterly, or semi-annually at designated monitoring wells, springs/seeps, and surface water stations. Biannual monitoring reports prepared by Barrick (Boulder Valley Monitoring Plan) and Newmont (Maggie Creek Basin Monitoring Plan) summarize all water resources monitoring data collected to date.

The U.S. Geological Survey (USGS) also collects groundwater and surface water data in the Project area. Additional details on hydrologic monitoring in the Project area are included in Chapter 3, *Water Quantity and Quality*. Newmont would monitor stability and function of the diversions and maintain them as required.

Cultural Resources

Cultural resource inventories have been completed for the Pete Project area. New sites that may be discovered during future cultural inventories would be mitigated by Newmont in accordance with Section 106 of the National Historic Preservation Act (Newmont 1999). For additional discussion of cultural resources, see Chapters 3 and 4, *Cultural Resources*.

Paleontological Resources

In the event vertebrate fossils are discovered within the Pete Project area during mining operations, Newmont would immediately notify the BLM Authorized Officer. Activities that could be taken after notification include cessation of mining activities in the area of discovery, verification and recordation of discovery, and development/implementation of plans to avoid or recover the fossils.

HAZARDOUS MATERIALS

Quantities Greater Than Reportable Quantities

The term "hazardous materials" is defined in 49 CFR 172.101. Hazardous substances are defined in 40 CFR 302.4 and the Superfund Amendments and Reauthorization Act (SARA) Title III. Hazardous materials and hazardous substances that would be transported, stored, or used at the Pete Project in quantities greater than the Threshold Planning Quantity (TPQ) designated by SARA Title III for emergency planning are summarized in **Table 2-3**.

The primary route for transporting hazardous materials to the Pete Project area would be via State Highway 766 north of Carlin, Nevada and then via the North-South Haul Road to the mine site. The alternative transportation route would be via the Dunphy Road connecting to the North-South Haul Road from the north. U.S. Department of Transportation (USDOT) regulated transporters would be used for shipment. USDOT-approved containers would be used for on-site storage (Newmont 2001a), and spill containment structures would be provided. Hazardous materials would be stored in designated areas on private and public land.

Quantities Less Than Reportable Quantities

Small quantities of hazardous materials less than the TPQ not included in **Table 2-3** would also be managed at the Pete Project area. These include auto and equipment maintenance products, office products, paint, and batteries.

Spill Prevention and Response Procedures

Newmont's Emergency Response Plan (Newmont 2001b) states that all maintenance facilities and fueling vehicles would be equipped with spill response materials. Earth moving equipment would be available from the mining operation for constructing dikes. Aboveground tanks and associated piping would be visually inspected for leaks on a daily basis. A spill containment basin would be constructed around bulk storage tanks to accommodate 110 percent of volume of the largest tank. The basin would have a liner to prevent any spillage from impacting soil and water resources. Mobile or portable oil storage tanks would be isolated to prevent spilled oil from reaching surface water.

Newmont personnel would be instructed in operation and maintenance of equipment to prevent discharge of oil. Spill response training would be provided through the Environmental Compliance Awareness Program outlined in Newmont's Emergency Response Plan (Newmont 2001b). Supervisors would schedule and conduct spill prevention briefings for personnel that would include a review of the Spill Prevention, Control and Countermeasure Plan. Known spills, malfunctioning components, and precautionary measures would be discussed during briefings.

Hazardous Wastes

Hazardous waste generation, treatment, and disposal is regulated by the federal Resource Conservation and Recovery Act (RCRA) (40 CFR §260-270). Under RCRA, Newmont would be considered a "conditionally exempt small quantity generator," for activities at the Pete Project because less than 100 kilograms of hazardous waste would be generated each month.

TABLE 2-3
Hazardous Materials Management
Pete Project

Substance	Area Used/Stored	Rate of Use (per year)	Quantity Stored On-site	Storage Method	Waste Management
Diesel Fuel	Mine/truck shop	1,500,000 gal	20,000 gal	Bulk tank	No waste
Hydraulic Fluid	Mine/truck shop	80,000 gal	3,000 gal	Bulk tank totes, drums	Recycled
Motor Oil	Mine/truck shop	20,000 gal	1,500 gal	Bulk tank totes, drums	Recycled
Antifreeze	Mine/truck shop	1,500 gal	480 gal	Bulk tank totes, drums	Recycled
Explosives	Mine/surface magazine	1,300,000 lbs	25,000 lbs	Magazines	No waste
Gasoline	Mine/truck shop	15,000 gal	5,000 gal	Bulk tank	No waste
Propane	Mine/surface	1,500,000 gal	45,000 gal	Bulk tank	No waste
Grease	Mine/truck shop	15,000 lbs	2,400 lbs	Totes, drums	Recycled

gal = gallon; lbs. = pounds
Source: Newmont 2001a.

Newmont has implemented a waste minimization program to evaluate hazardous substances used on mine property. Where possible, alternative products that generate no waste or solid waste, rather than RCRA-regulated hazardous waste, would be used. Hazardous wastes generated at the Pete Project would be transported to permitted waste disposal facilities by licensed waste haulers. When practicable, the wastes would be sent to recycling facilities.

Toxic Release Inventory

Since 1998, the mining industry has been required to comply with Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA, Public Law 99-499, Title III, Superfund Amendment and Reauthorization Act, 1986) and Section 6607 of the Pollution Prevention Act. These laws are intended to increase public awareness and access to information concerning presence and release of toxic chemicals in the community. The Act is often referred to as Toxic Release Inventory (TRI) and requires certain type facilities to meet specific criteria including those facilities with specified Standard Industrial Classification code designations and provide annual reports to state and federal (EPA) agencies regarding releases of listed toxic and hazardous chemicals to the environment.

The proposed Pete Project falls within Standard Industrial Code 1041, and is required to submit Chemical Release Reporting Forms (Form R or A) for listed chemicals that exceed designated thresholds to EPA and State of Nevada. Forms R or A are required for all Section 313 chemicals and compounds which exceed annual threshold levels for "manufacturing" (25,000 pounds), "processing" (25,000 pounds), and "otherwise used" (10,000 pounds) classifications. In reporting year 2001, companies must report to a 10-pound threshold level for Persistent Bioaccumulative Toxins, which includes lead and mercury.

Airborne emissions of elements and compounds associated with processing Pete Project ore would be emitted as a portion of the total emissions from Newmont's North and South Operation Areas. A discussion of elements and compounds released to the environment is included in Chapter 4, *Air Quality.*

HUMAN HEALTH AND SAFETY

Human health and safety at the Pete Project would be regulated by the Federal Mine Safety and Health Act of 1977 (MSHA), which sets mandatory safety and health standards for surface metal and nonmetal mines. The purpose of these health and safety standards is the protection of life, promotion of health and safety, and prevention of accidents. MSHA regulations are codified under 30 CFR Subchapter N, Part 56. Employees at the Pete Project would be required by Newmont to receive training as outlined in **Table 2-4.**

EMPLOYMENT

The Pete Project would employ approximately 50 people. The work force for the Pete Project would be from Newmont's existing mine-related work forces in the Carlin Trend.

RECLAMATION

Reclamation activities for the Pete Project are designed to achieve post-mining land use consistent with BLM's Resource Management Plan for the Elko Resource Area. Reclamation is intended to return disturbed land to a level of productivity comparable to pre-mining levels associated with adjacent land. Post-mining land use includes wildlife habitat, livestock grazing, dispersed recreation, and mineral exploration and development.

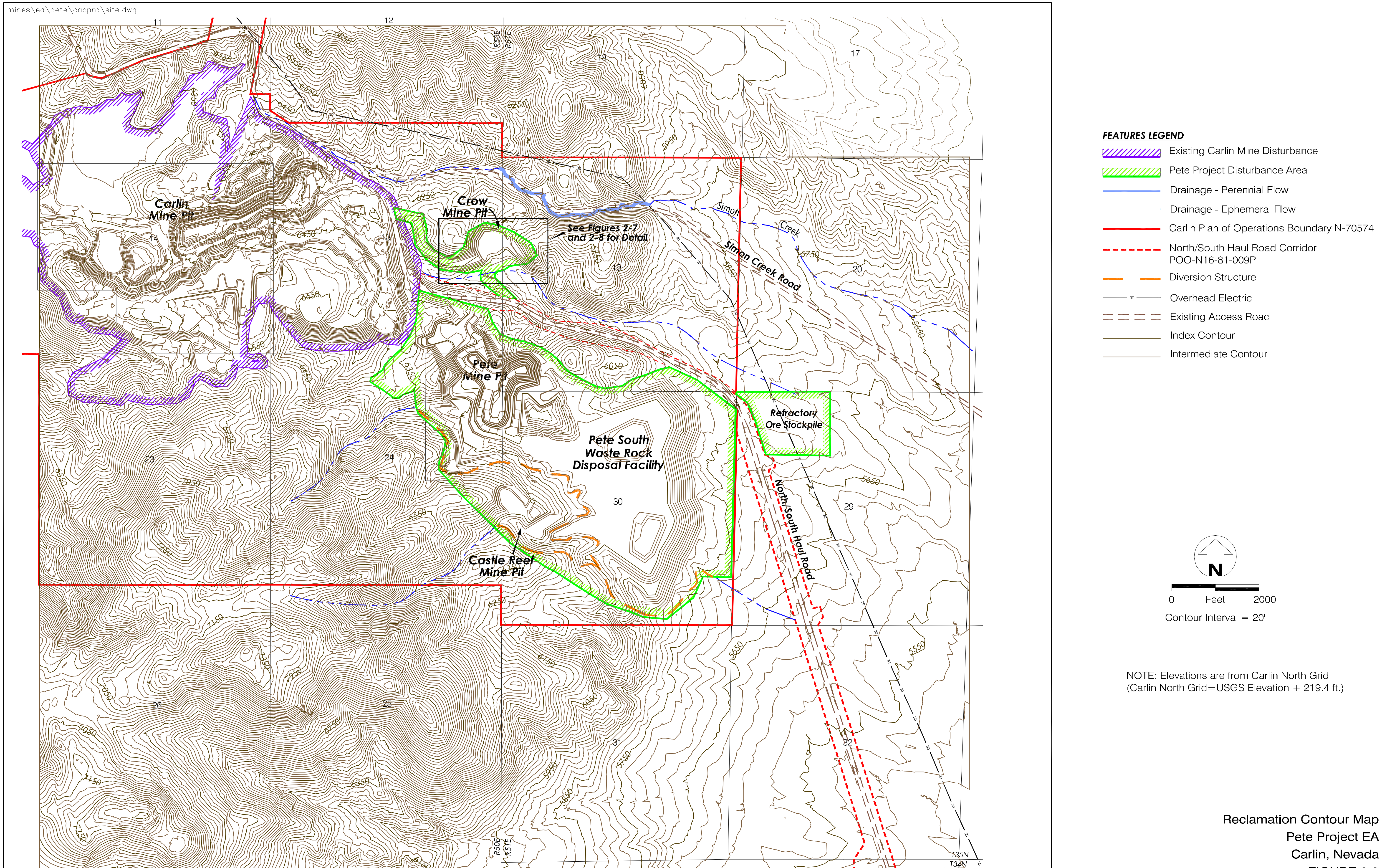
Short-term reclamation goals would be to stabilize disturbed areas and protect disturbed and adjacent undisturbed areas from unnecessary or undue degradation. Long-term reclamation goals would be to ensure public safety, stabilize the site, and establish a productive vegetative community consistent with post-mining land uses.

Reclamation activities would include closure and regrading the waste rock disposal facility, regrading disturbed areas (including roads), drainage control, removal and regrading stockpile areas, replacement of salvaged soil, revegetation, and reclamation monitoring. The reclamation schedule would encompass the period between cessation of mining through revegetation. Reclamation activities are expected to begin in 2010 and completed approximately 2 years after mining ceases. Reclamation would take place concurrent with operations where possible. The proposed post-reclamation topography for the Pete Project mines is shown on **Figure 2-9.**

TABLE 2-4
Pete Project Health and Safety Training Programs

Course	Personnel	Frequency	Duration	Instruction
New-hire Training	All new hires exposed to mine hazards	Once	24 hours	Employee rights Supervisor responsibilities Self-rescue Respiratory devices Transportation controls Communication systems Escape and emergency evacuation Ground control hazards Occupational health hazards Electrical hazards First aid Explosives Toxic materials
Task Training	Employees assigned to new work tasks	Before new assignments	Variable	Task-specific health and safety procedures Supervised practice in assigned work tasks in nonproductive duty
Refresher Training	All employees who received new-hire training	Yearly	8 hours	Required health and safety standards Transportation controls Communication systems Escape routes, emergency evacuations Fire warning Ground control hazards First aid Electrical hazards Accident prevention Explosives Respirator devices
Hazard Training	All employees exposed to mine hazards	Once	Variable	Hazard recognition and avoidance Emergency evacuation procedures Health standards Safety rules Respiratory devices

Source: Newmont 1999.



NOTE: Elevations are from Carlin North Grid
(Carlin North Grid=USGS Elevation + 219.4 ft.)

Reclamation Contour Map
Pete Project EA
Carlin, Nevada
FIGURE 2-9

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Soil Salvage

The Donna-Simon Association and Taylor Creek-Chen Association are the soil map units that would be disturbed by mining operations in the Pete Project area. Based on NRCS (1993) *Soil Interpretation Rating Guide*, suitability of these soil units for reclamation ranges from "poor" (Taylor Creek-Chen) to "fair" (Donna-Simon). Recommended soil salvage depths for these soil units ranges from 6 to 40 inches and could provide from 1.1 million cubic yards of soil rated "fair" (Donna Simon) to 1.7 million cubic yards of "fair" and "poor" (Donna-Simon plus Taylor Creek-Chen) rated soil for reclamation purposes. Using soil with suitability rating of "fair" could provide 12-inches of cover soil over 601 acres of disturbed area.

As the mine, haul and access roads, stockpile and waste rock disposal facilities are developed, Newmont would recover available topsoil for future use in reclaiming disturbed areas. Topsoil recovery depths would be determined during salvage operations by reclamation specialists in accordance with NRCS (1993) recommend-ations. Topsoil would be salvaged and transported to stockpiles using scrapers, wheel and track dozers, haul trucks, and loaders. Topsoil stockpile locations are shown on **Figure 2-2**. Soil map units and soil suitability ratings are summarized in **Appendix A.** Soil map units in the Pete Project area are described in Chapter 3, *Soil*.

Grading Disturbed Areas

Prior to replacing soil or suitable growth media, facility sites would be graded to attain slope configurations shown on **Figure 2-9**. Grading would create a stable post-mining configuration for disturbed areas, establish effective drainage to minimize erosion, and protect surface water resources. To the extent practicable, grading would blend disturbed areas with the surrounding terrain. Angular features, including tops and edges of the waste rock disposal facility, would be rounded.

Reclaiming Open-pit Mines

Pursuant to NAC 519A.250.4, Newmont would request an exemption from backfilling the Pete Project open-pits. Backfilling open-pits would not be economically or practically feasible due to the associated costs. Backfilling mine pits would involve relocation of the Pete South Waste Rock Disposal Facility at the end of mining, excavation and placement of additional material, and would prevent future access to mineral resources.

The reclamation objective for the Pete Project open pits would be to ensure public safety and restrict access to pit areas. Earthen berms would be constructed and warning signs installed around the perimeter of each mine pit to deter accidental access by the public and to warn of potential hazards associated with mine pits. After mining ceases, pit sidewalls and faces would ravel to create a natural, stable final slope and as such, additional stabilization activities would not be necessary. All berms and signs would be monitored and maintained on a routine basis until all reclamation activities are complete and bond released. Abandoned boreholes would be plugged in a manner similar to exploration boreholes. The upper portion of each borehole would be filled with concrete and the lower portion would be filled with pelletized bentonite.

Revegetation

Prior to initiating the proposed reclamation vegetation plan, Newmont would evaluate topsoil replacement depths for north and south exposures. Soil replacement depths would vary according to location and soil type. The variety of replacement depths would provide different vegetation mosaics on reclaimed areas. The regraded surface would be ripped where necessary prior to placement of topsoil. Ripping would reduce compaction, provide a uniform seed bed, and establish a bond between seed and topsoil. Newmont's revegetation program goals are to stabilize reclaimed areas, ensure public safety, and establish a productive vegetative community based on applicable land use plan and designated post-mining land uses (Newmont 1999). **Table 2-5** is the proposed seed list for reclamation in the Pete Project area. Actual seed mix to be used during reclamation would be selected from the seed list in **Table 2-5** depending on availability or cost. Seed would be applied at a rate of approximately 15 pounds pure live seed (PLS) per acre. Modifications in the seed list, application rates, and cultivation methods and techniques could occur based on success of concurrent reclamation. Changes

TABLE 2-5
Seed List for Pete Project Area

Grasses	
Bluebunch wheatgrass	***Agropyron spicatum***
Thickspike wheatgrass	***Agropyron dasystachyum***
Streambank wheatgrass	***Agropyron riparium***
Western wheatgrass	***Agropyron smithii***
Sandberg bluegrass	***Poa sandbergii***
Great Basin wildrye	***Elymus cinereus***
Indian ricegrass	***Oryzopsis hymenoides***
Webber ricegrass	***Oryzopsis webberi***
Idaho fescue	***Festuca idahoensis***
Green needlegrass	***Stipa viridula***
Bottlebrush squirreltail	***Sytantion hystrix***
Crested wheatgrass	***Agropyron cristatum***
Sheep fescue	***Festuca ovina***
Slender wheatgrass	***Agropyron trachycaulum***
Canby bluegrass	***Poa canbyi***
Sand dropseed	***Sporabolus cryptandrus***
Alkali sacaton	***Sporabolus airoides***
Forbs	
Yellow sweetclover	***Melilotus officinalis***
Cicer milkvetch	***Astragalus cicer***
Northern sweetvetch	***Hedysarum boreale***
Buckwheat	***Eriogonum***
Common sainfoin	***Onobrychis viciaefolia***
White sweetclover	***Melilotus alba***
Alfalfa	***Medicago sativa***
Annual ryegrass	***Lolium perenne multiflorum***
Barley	***Hordeum***
Western Yarrow	***Achillea millefolium***
Blue flax	***Linum lewisii***
Gooseberry leaf globemallow	***Sphaeralcea grossulariaefolia***
Small burnet	***Sanguisorba minor***
Scarlet globemallow	***Sphaeralcea coccinea***
Desert globemallow	***Sphaeralcea ambigua***
Arrowleaf balsamroot	***Balsamhoriza saggitata***
Palmer penstemon	***Penstemon palmeri***
Shrubs	
Big sagebrush	***Artemisia tridentata var. tridentata, wyomingensis***
Antelope bitterbrush	***Purshia tridentata***
Serviceberry	***Amelanchier (alnifolia) utahensis***
Snowbrush	***Ceanothus spp.***
Winterfat	***Ceratoides lanata***
Chokecherry	***Prunus virginiana***
Black sage	***Artemisia nova***
Shadscale	***Atriplex confertifolia***
Fourwing saltbush	***Atriplex canescens***
Prostrate summer cypress	***Kochia prostrata***
Rubber rabbitbrush	***Chrysothamnus nauseosus***
Mormon tea	***Ephedra (nevadaensis) (viridis)***
Currant	***Ribes spp.***
Woods rose	***Rosa woodsii***
Snowberry	***Symphoricarpos spp.***

Source: Newmont 2001a.

and/or adjustments to seed mixtures and application rates would be developed through consultation with and approval by BLM and NDEP. Seedlings may be substituted for seeds.

The seed mix selected would represent a Reclaimed Desired Plant Community and the mix would be appropriate for each ecological site description in the study area.

Concurrent Reclamation

Newmont has been conducting concurrent reclamation at the Pete Project area addressing disturbances resulting from exploration activities. Disturbances include exploration roads, drill pads, trenches, sumps, and other land disturbances within the Carlin Plan of Operations Area. As various facilities reach the end of their period of use, Newmont would initiate reclamation activities concurrent with exploration and mining operations.

Waste Rock Disposal Facility

Recontouring and reclamation would be performed on the Pete South Waste Rock Disposal Facility as each lift is completed. Reclamation would focus on creating and maintaining the mule deer migration corridor through the Pete Project area. Facility construction would allow unrestricted migration of mule deer through the Pete Project area. Slopes of the Pete South Waste Rock Disposal Facility would be regraded to provide a minimum 3H:1V reclaimed slope. Grading would minimize potential for mass failures or rill erosion, facilitate reclamation activities (seeding, mulching), and provide a surface that would support vegetation. The top of the waste rock disposal facility and remaining benches would be graded to promote runoff of water (free draining), prevent ponding or impounding of water, and prevent erosion.

The seepage collection pond system would remain in place until the agencies determine that it is no longer needed for solution collection. Newmont would remove the pond dike, regrade, and seed the pond site in accordance with the pit reclamation plan.

Upon completion of grading, topsoil or other suitable growth media would be redistributed to an average depth of 12-inches over the waste rock. The waste rock would be regraded, ripped (to relieve compaction from mining equipment), and seeded according to the reclamation plan (Newmont 1999).

Ore Stockpile

The refractory ore stockpile would be removed at the end of mine life and stockpile area reclaimed by regrading and revegetating to blend with surrounding topography.

Roads

Roads associated with the Pete Project would be reclaimed concurrently with cessation of operations in each individual area. Roads remaining at the end of mining operations would be reclaimed when no longer needed for reclamation and access. Reclamation of haul roads would be by regrading to provide proper drainage, replacement of topsoil, and revegetation. Reclaimed roads would be regraded, to the extent practical, to establish original topography and drainage of the site and to control erosion. Haul roads associated with the Pete South Waste Rock Disposal Facility would be reclaimed concurrently with closure of the disposal site.

Exploration roads, drill pads, sumps, and trenches would be reclaimed in conjunction with ongoing operations. Exploration roads are constructed by stripping topsoil and using the topsoil as a safety berm at the edge of the exploration road. Topsoil in the berm is redistributed back onto the regraded surface during reclamation.

Ancillary Facilities

At the end of the Pete Project mine life, the explosives magazine, fuel tanks, and other mine support structures with significant salvage value would be dismantled for salvage or used for other operations in the area. Unused explosives would be returned to the vendor or used at other mine sites in adjacent areas. Hazardous material would be decontaminated and disposed of at approved landfills. Hydrocarbon contaminated soil would be hauled to the North Area Bio-Remediation Pad. The Fuel Pad and

Maintenance Area would be regraded, and revegetated to blend with surrounding topography.

Monitoring/Evaluation of Reclamation Success

Newmont, in cooperation with BLM and NDEP, would evaluate the status of vegetative growth during three full growing seasons following completion of regrading, resoiling, and planting. Final bond release may be considered at that time. Interim progress of reclamation at the Pete Project area would be monitored as requested by the agencies.

Newmont conducts noxious weed surveys for their operations in the Carlin Trend. Priority treatment areas are identified and these areas are treated to eradicate or control noxious weeds.

PROJECT ALTERNATIVES

This section describes alternatives to the Proposed Action (Pete Project), including the No Action Alternative, Alternatives Considered but Eliminated from Detailed Analysis, and the Agency Preferred Alternative. Alternatives selected by BLM for consideration in this EA are based on potential impacts or issues associated with the Proposed Action, including those identified during the scoping process. BLM is required to analyze environmental effects resulting from the Proposed Action and to identify reasonable alternatives that would mitigate, minimize, or eliminate potential impacts. BLM is also required to analyze the No Action Alternative and describe the environmental consequences that would result if the Proposed Action is not implemented.

Major components of the proposed mine development, their respective functions, and potential environmental effects resulting from implementation of these activities are considered in development of alternatives. Potential mitigation measures are described in Chapter 4 for each resource. Other alternatives were considered early in the review process. These alternatives were eliminated because they were either technically or economically infeasible, or they provided no environmental advantage over the Proposed Action.

ALTERNATIVES CONSIDERED IN DETAIL

No components of the Proposed Action were determined to have potentially significant impacts requiring an alternative to eliminate or reduce impacts. Therefore, the only alternative to the Proposed Action discussed in detail in this EA is the No Action Alternative. Minor issues and impacts identified in Chapter 4, *Consequences of the Proposed Action,* are addressed with specific mitigation measures if applicable.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not be approved. Newmont would not be authorized to develop defined ore reserves, construct ancillary mine facilities, or place waste rock in the disposal facility on public land. Potential impacts predicted to result from development of the Project would not be realized.

ENVIRONMENTAL PROTECTION MEASURES

This section contains descriptions of mitigation and monitoring measures included in Newmont's proposed Plan of Operations for the Pete Project. Mitigation and monitoring measures described below apply to the Proposed Action:

- All surface disturbance would be reclaimed in accordance with applicable federal, state, and local regulations;
- Topsoil would be salvaged from proposed disturbance areas. Soil material would be stockpiled for future use or direct hauled to regraded areas and placed in preparation of final surface reclamation;
- Surface water control ditches would be constructed as necessary around surface facilities, stockpiles, and the waste rock disposal facility to control surface water run-on/run-off;
- Waste rock would be placed on a compacted area that is sloped to drain to an external collection pond;

- Vegetative growth would be evaluated during three growing seasons following completion of regrading, resoiling, and seeding; and,

- Fencing of revegetated areas to protect from livestock grazing. Use of shrub plantings to establish vegetation.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

This section describes alternatives to the Proposed Action that were eliminated from further review in the EA. These alternatives were identified during scoping and review and analysis of the Proposed Action. These alternatives were considered technically infeasible, unreasonable, provided no advantage over the Proposed Action, or would not meet the purpose and need of the Proposed Action.

Backfill the Pete and/or Castle Reef Mine Pits

Backfilling the Pete and/or the Castle Reef Mine pits were considered as part of agency review of the Plan of Operations. Backfilling the Pete Mine pit would restore approximately 223 acres of land surface (33 acres public land and 190 acre private land) to productive use after reclamation of the mine site. Backfilling the Castle Reef pit would restore approximately 40 acres to productive use. To complete backfill of the Pete and Castle Reef Mine pits, Newmont would be required to rehandle approximately 54 million cubic yards of material from the Pete South Waste Rock Disposal Facility. Placement of this volume as backfill into the Pete and Castle Reef Mine pits would leave approximately 15 million cubic yards of waste rock in the disposal facility. Because mined material experiences an approximate 30 percent swell factor once excavated, not all the waste rock generated during mining of the Pete Project would fit back into the mined out pit.

Rationale for Eliminating this Alternative

Backfilling the Pete or Castle Reef Mine pits would eliminate access to additional ore reserves located at the bottom of the pit. Changes in the price of gold could result in making reserves in the pit economical for recovery.

Backfilling the pit would also require rehandling approximately 50 million cubic yards of waste rock material for the Pete pit and 4 million cubic yards for the Castle Reef pit. Based on the equipment fleet used to develop the mine, backfilling operations would require approximately three years to complete after cessation of mining. The fuel consumed by haul trucks and loading equipment would be comparable to the fuel consumption required for mining the deposit.

This alternative would not have any advantage over the Proposed Action because no impacts of the Proposed Action would be changed by implementation of this alternative.

CHAPTER 3

AFFECTED ENVIRONMENT FOR PROPOSED ACTION

INTRODUCTION

Existing resources in the Pete Project area are described in this chapter. The Project area is located in the Maggie Creek drainage in northern Eureka County, Nevada (**Figure 3-1**). Elevation in the Project area ranges from 5,000 feet above mean sea level (amsl) in the south and west valley bottom areas to over 7,000 feet amsl in the Tuscarora Range.

Figure 3-1 shows the general study area for most environmental resource investigations. Study areas for each environmental resource are based on the geographic area predicted to be directly or indirectly impacted by the Proposed Action. Study areas for some resources extend beyond the boundaries depicted in **Figure 3-1**. For those resources, a description of the study area is provided in that resource description.

Appendix 5 of BLM NEPA Handbook (H-1790-1) identifies Critical Elements of the Human Environment that are subject to requirements specified in statutes or executive orders and must be considered in BLM environmental assessments (EAs) and environmental impact statements (EISs). The following Critical Elements of the Human Environment and other resources could be affected by the Proposed Action:

- Air Quality;
- Cultural Resources;
- Invasive, Nonnative Species;
- Threatened, Endangered, Candidate, and Sensitive Species;
- Water Quality (Surface/Ground);
- Migratory Birds; and
- Wetlands/Riparian Zones.

The following Critical Elements of the Human Environment have been analyzed by BLM and would not be affected by the Proposed Action or are not present in the proposed Project area:

- Areas of Critical Environmental Concern;
- Environmental Justice;
- Farmland (prime or unique);
- Floodplains;
- Native American Religious Concerns;
- Paleontology;
- Wild and Scenic Rivers; and
- Wilderness.

BLM specialists have determined that the following resources, although present in the study area, would not be affected by the Proposed Action:

- **Access and Land Use:** The Pete Project is located approximately 21 miles northwest of Carlin, Nevada in sections 13, 14, 23 and 24, T35N, R50E, and sections 19, 29, and 30, T35N, R51E, in Eureka County. The Project site is located on public land administered by BLM, and private land controlled by Newmont (**Figure 2-1**). Newmont controls all mining claims located on public land that could be affected by the proposed Project. Access to the Project area is north from Carlin, via State Route 766 to the Simon Creek road, then north to the Carlin Mine. The Pete Project is adjacent to the southeast corner of the Carlin Mine.

- **Environmental Justice:** Data are not present in BLM files that would suggest the Project area has been used by a minority or low-income population in the recent past for procurement of subsistence resources. Further, no such information was developed during Native American consultation activities (see *Native American Religious Concerns* below). As a result, the Proposed Action would not have an affect on subsistence patterns important to a minority or low-income population.

- **Native American Religious Concerns:** On January 20, 2000, BLM initiated consultation with the Te-Moak Tribe, Duck Valley Tribe, Western Shoshone Historic Preservation Society, and the Battle Mountain, Wells, South Fork, and Elko Band councils. In addition, the BLM discussed the Project at informational meetings held February 14 and March 16, 2000. The BLM received a single written response from the Western Shoshone Historic Preservation Society that stated the Project area was within the boundaries of the Ruby Valley Treaty and requested BLM to protect cultural resources in the area. No other written responses were received. As a result, BLM has determined that the Pete Project would have no effect on Native American religious, traditional, or spiritual sites.

- **Recreation:** Dispersed recreation opportunities in the Pete Project area have been restricted since the early 1980s due to intensified mining and exploration activities in the Carlin Trend. Addition of the Pete Project would result in fewer acres available for recreational activities during operation and after cessation of mining until reclamation is complete.

- **Social and Economic Resources:** Impacts to socioeconomic resources occur if a large number of workers and their families move into an area as a result of jobs either directly or indirectly created by mine development and operation. Newmont anticipates a majority of operational personnel would be hired from the existing mine-related work force in the Carlin Trend. The Pete Project would provide continued employment in the mining industry and secondary jobs in retail and service sectors, and payment of property and net proceeds taxes to state and local jurisdictions.

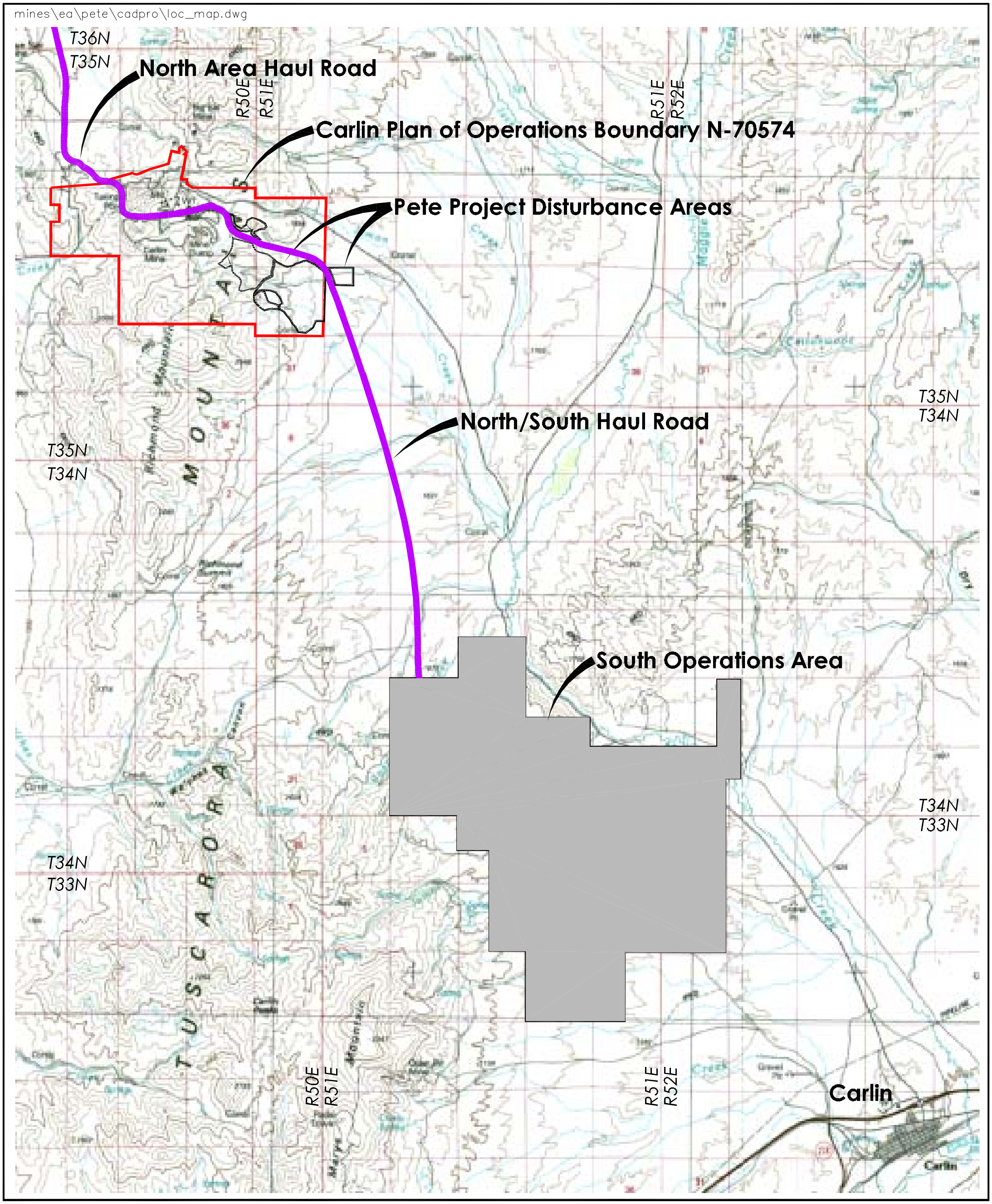
This chapter provides a summary of environmental baseline information. In the following sections, "Project area" and "study area" refer to the Proposed Action and land surrounding the proposed mine. The "area of potential effect" as used in the *Cultural Resources* section is synonymous with the Project area.

GEOLOGY AND MINERALS

A description of regional geology and gold mineralization in northern Nevada is presented in Chapter 2, *History of Exploration and Mining*. This section of Chapter 3 provides a detailed description of geology within the Pete Project area.

The Pete Project area is located within the Basin and Range Physiographic Province, a region that extends over most of Nevada and parts of adjoining states. The Project area is located along a series of east west trending finger ridges emanating from the eastern foothills of the Tuscarora Mountains. The ridges tend to be low and broad, with minor gradients. Elevation ranges from 5,320 feet amsl at the southeast corner of the Project area to 5,520 feet amsl along the western edge of the Project site. Range-front faulting in the province has created north-south trending fault-block mountain ranges separated by broad valleys filled with varying depths of Quaternary-age alluvium.

Bedrock in the Tuscarora Mountains is comprised primarily of early Paleozoic-age (505 to 360 million years before present) limestone, silty limestone, dolomite, silty mudstone, chert, and quartzite. Paleozoic-age rocks include the Ordovician-age Vinini Formation (western siliceous assemblage) and the Silurian- to Devonian-age Roberts Mountains Formation (eastern carbonate assemblage) (**Figure 3-2** and **3-3**). A major structural feature in the Project vicinity is the Roberts Mountains Thrust **(Figure 3-4** and **3-5**), which in late-Devonian to early-Mississippian time placed the "Upper Plate" chert and shale of the Ordovician-age Vinini Formation over the "Lower Plate" of Cambrian- to Devonian-age carbonate rocks (Adkins and Rota 1984).



From Sure!MAPS RASTER. Nevada Map

Study Area
Pete Project EA
Carlin, Nevada
FIGURE 3-1

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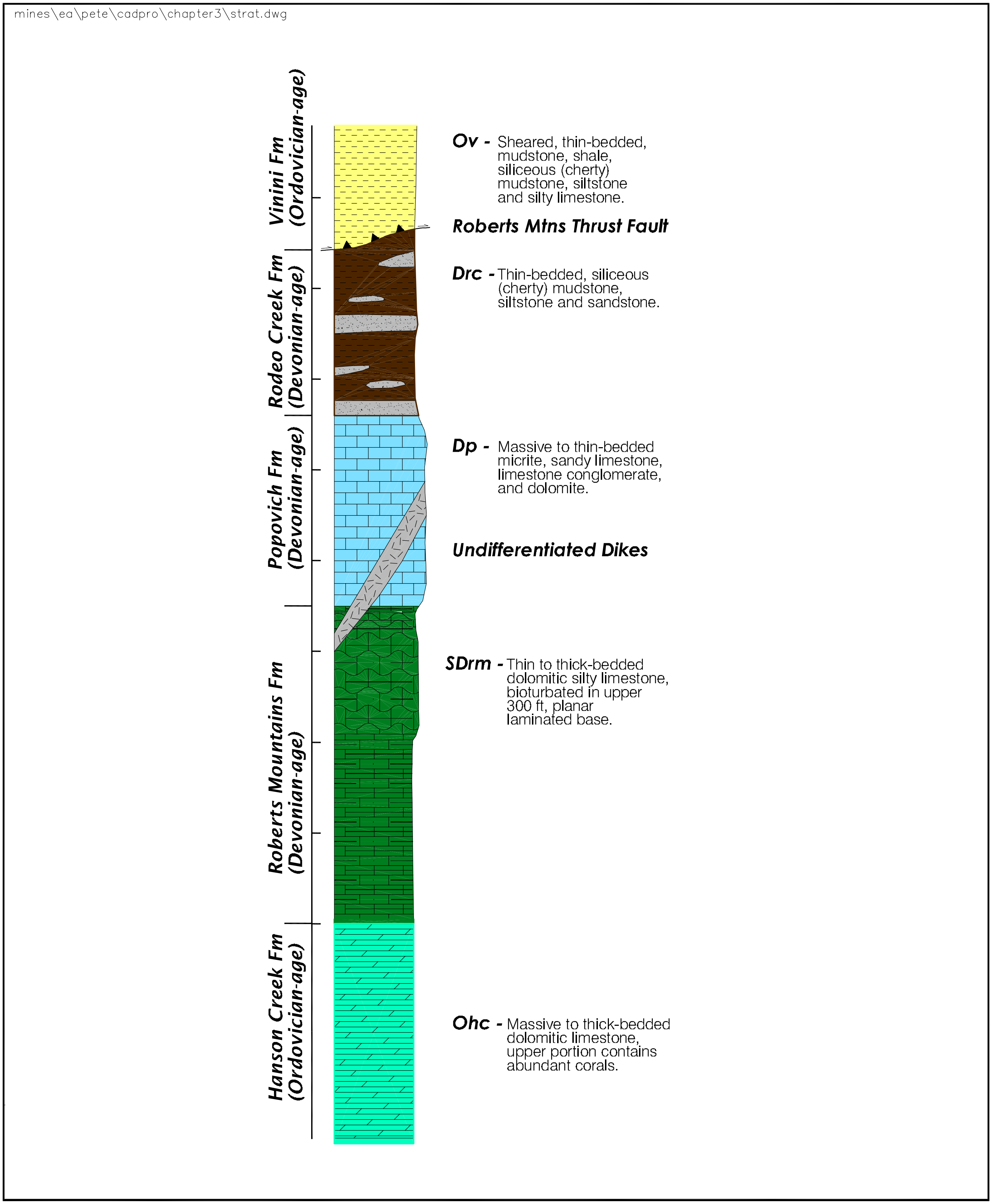

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Vertical Scale

Stratigraphic Cross Section

Pete Project EA

Carlin, Nevada

FIGURE 3-2

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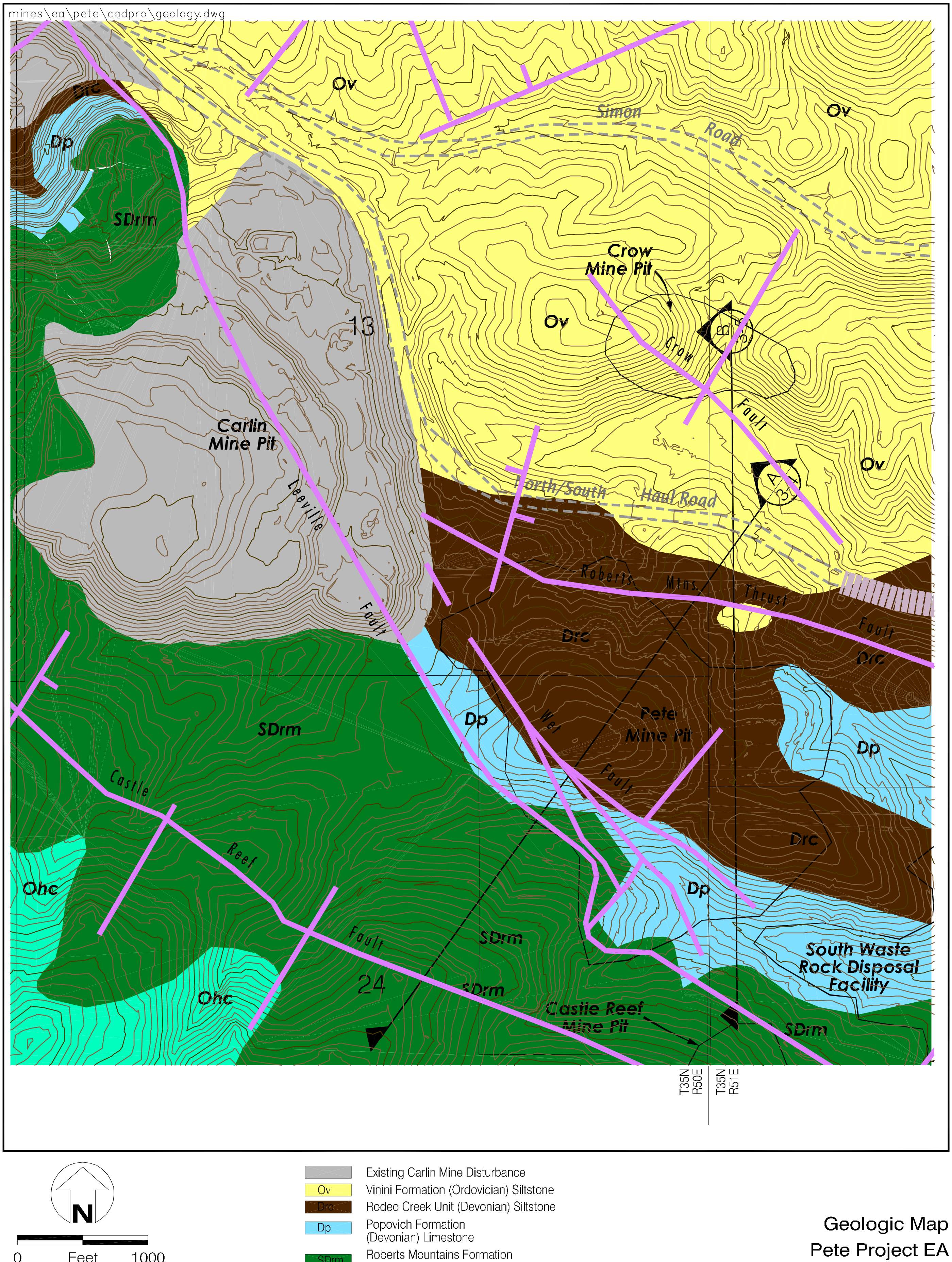

	Existing Carlin Mine Disturbance
Ov	Vinini Formation (Ordovician) Siltstone
Drc	Rodeo Creek Unit (Devonian) Siltstone
Dp	Popovich Formation (Devonian) Limestone
SDrm	Roberts Mountains Formation (Devonian) Limestone
Ohc	Hanson Creek Formation (Ordovician) Limestone
	Fault

Geologic Map
Pete Project EA
Carlin, Nevada
FIGURE 3-3

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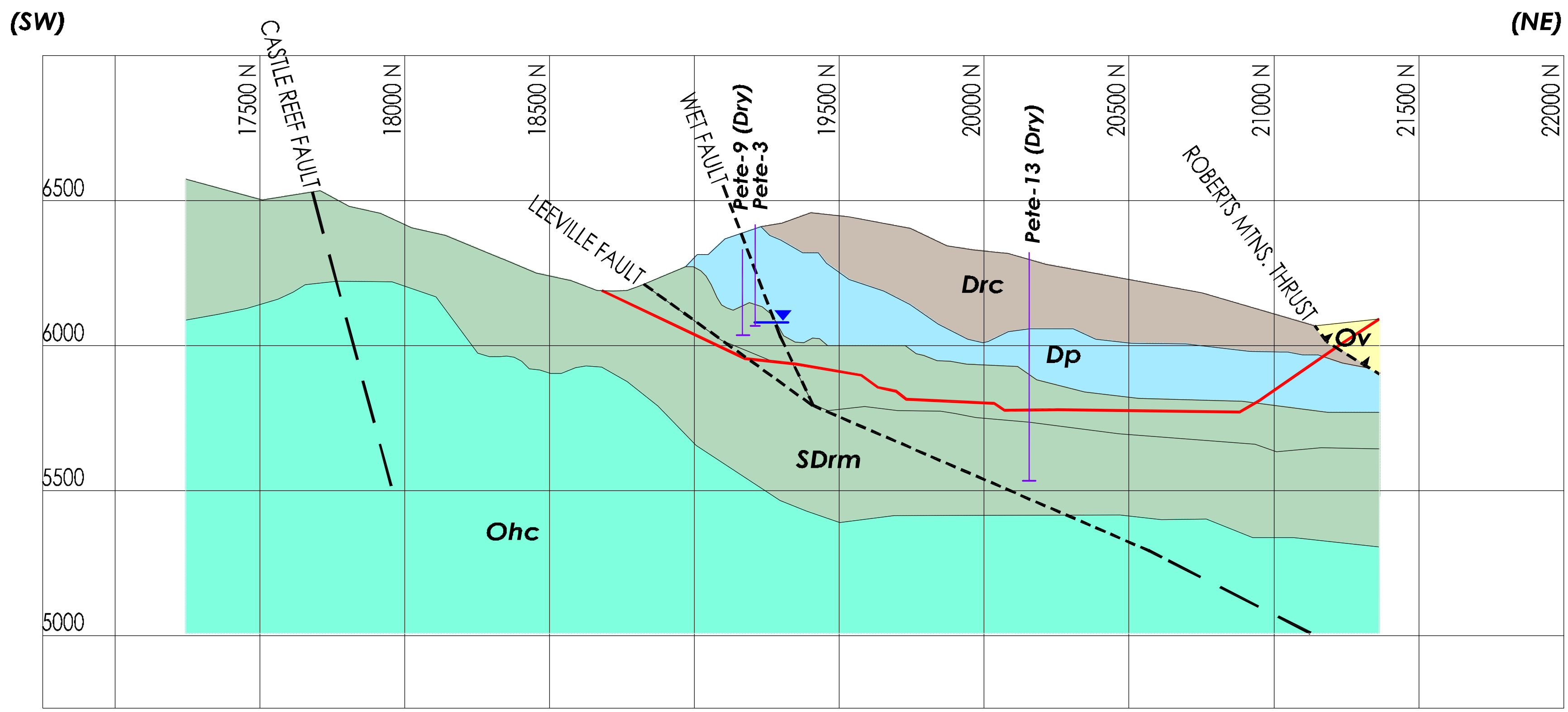

Note: See Figure 3-3 for Cross Section Location. Elevations are Carlin North Grid

Ov	Vinini Formation (Ordovician), Siltstone (Upper Plate)
Drc	Rodeo Creek Formation (Devonian), Siltstone (Lower Plate)
Dp	Popovich Formation (Devonian), Limestone (Lower Plate)
SDrm	Roberts Mountains Formation (Devonian), Limestone (Lower Plate)
Ohc	Hanson Creek Formation (Ordovician), Limestone (Lower Plate)

Faults
Proposed Pete Mine Pit
Static Water Level
Monitoring Well

Geologic Cross Section - A
Pete Project EA
Carlin, Nevada
FIGURE 3-4

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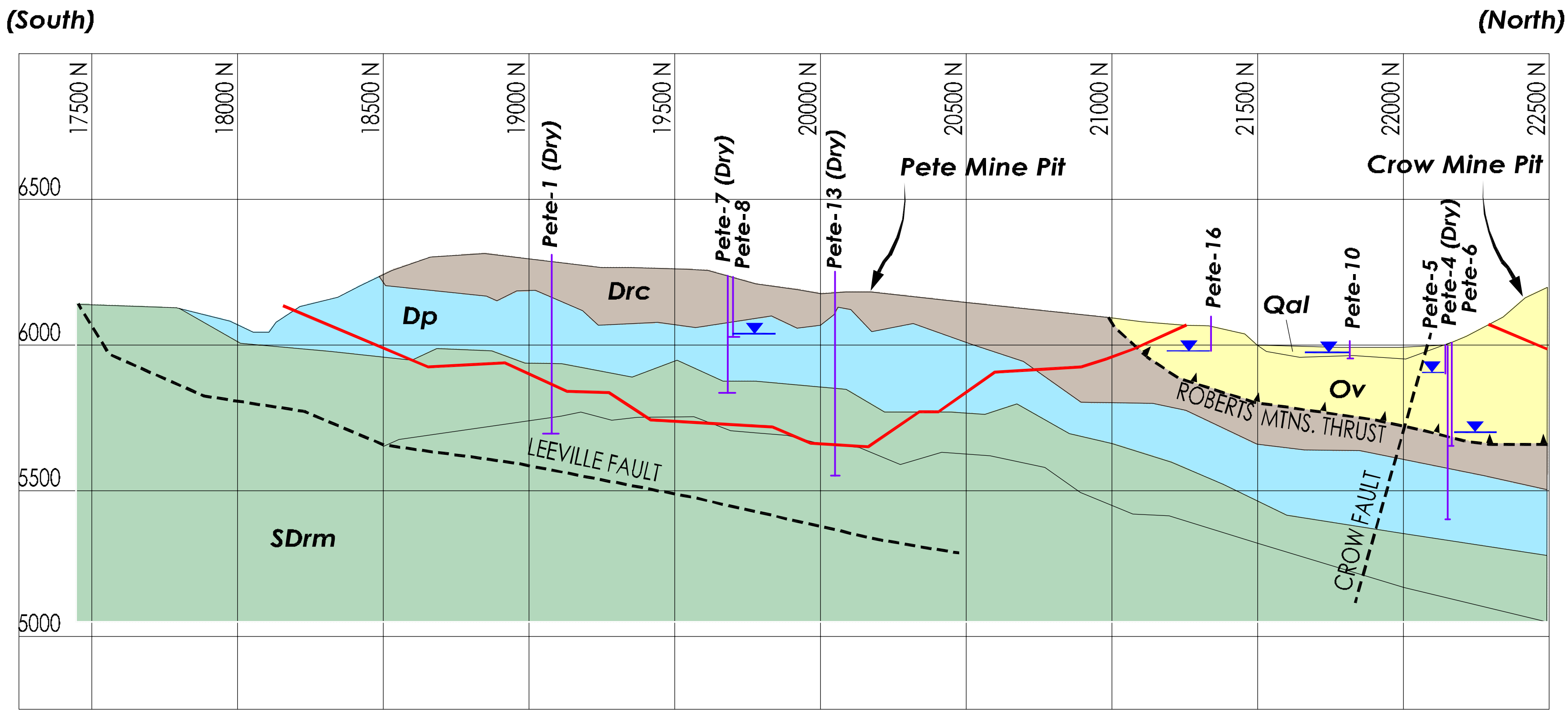

Note: See Figure 3-3 for Cross Section Location. Elevations are Carlin North Grid.

Qal	Alluvium (Quaternary)
Ov	Vinini Formation (Ordovician), Siltstone (Upper Plate)
Drc	Rodeo Creek Formation (Devonian), Siltstone (Lower Plate)
Dp	Popovich Formation (Devonian), Limestone (Lower Plate)
SDrm	Roberts Mountains Formation (Devonian), Limestone (Lower Plate)

Faults
Proposed Mine Pit
Static Water Level
Monitoring Well

Geologic Cross Section - B
Pete Project EA
Carlin, Nevada
FIGURE 3-5

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The Upper Plate Vinini Formation is comprised of chert, mudstone, greenstone, and silty limestone rocks that were deposited in a deep marine environment. Lower Plate rocks are composed of: siliceous mudstone and siltstone of the Rodeo Creek unit; thin to medium bedded limestone and silty limestone of the Popovich Formation; and thin to medium bedded limestone and silty limestone of the Roberts Mountains Formation (Jackson et al. 1997).

During the Mesozoic Era (65 to 225 million years before present), granitic stocks and dikes intruded the area along existing high angle faults. During the Cenozoic Era (66 million years ago to present), tectonic processes including volcanism, crustal extension, and high-angle faulting shaped the existing topography. Faulting and folding are widespread, particularly in the flanks of the Tuscarora Mountains and Tuscarora Spur. Regional folding and localized drag folding are present with one of the more prominent folds, the Tuscarora Anticline, forming the Tuscarora Spur. Paleozoic-age rocks and faults are offset by Tertiary-age high-angle faults.

Mineralization associated with the Pete Project deposits occur in Silurian-Devonian-age Roberts Mountains Formation, which is characterized by thin-bedded, variably carbonaceous, dolomitic, and silty limestone with lesser calcareous siltstone (Harvey 1991). Ore in the Pete Project area occurs primarily as a strata-bound zone located in the lower half of the Roberts Mountains Formation. The upper portion of the ore zone is relatively depleted in sulfides as a result of oxidation. At depth, oxidation is controlled by faults, joints, and bedding planes. Unoxidized carbonaceous and sulfide-rich ores and silica-locked ores result in variable refractory responses during ore processing (Zimmerman et al. 1988).

AREA SEISMICITY

Although several faults exist within the Project area itself, no fault scarps suggestive of recent seismic activity have been identified in the Project area (BLM 1991). Historic earthquakes (post-1872) within 30 miles of the site range from barely detectable up to magnitude 5.1. Within a 90-mile radius, the strongest historic earthquake occurred on October 15, 1915, with a magnitude of 7.8 (dePolo and dePolo 1999). The epicenter of this earthquake was located approximately 80 miles southwest of the Project site in Pleasant Valley, Nevada. As recently as August 25, 2001, an earthquake occurred with a magnitude of 3.4 about 43 miles northwest of Elko, Nevada. The epicenter was located 20 miles west of Tuscarora, Nevada and 50 miles northwest of the Project area.

Potential effects of earthquake shaking on project facilities was assessed by Newmont during project design. Parameters typically used to characterize seismicity are: 1) magnitude of the controlling earthquake; 2) maximum horizontal acceleration induced in bedrock at the site by the controlling earthquake; and 3) probability of occurrence of the controlling earthquake.

The maximum predicted earthquake magnitude (M) for the area, as determined by several researchers, is shown in **Table 3-1**. Researchers used two separate methods to assess seismicity in the region: 1) estimation of the maximum credible earthquake based on determination of active faults in the area, and, 2) probabilistic estimation of the risk of earthquake occurrence based on regional seismic modeling. The maximum credible earthquake is the largest earthquake that can be reasonably expected to occur on a fault or over an area. Using the probabilistic approach, Algermissen et al. (1982) estimated that the probability of not exceeding bedrock acceleration of 0.17 gravity (g) in any given 50-year period would be 90 percent, and the probability of not exceeding 0.35g in 250 years would also be 90 percent (**Table 3-1**).

TABLE 3-1
Seismic Characterization for Pete Project Area

Assessment Method	Maximum Earthquake Magnitude (M)	Maximum Horizontal Acceleration (g)	Probability of Occurrence
Regional probabilistic assessment	7.3	0.17	90% probability of not being exceeded in 50 years
	7.3	0.35	90% probability of not being exceeded in 250 years

Note: gravity (g) = 9.81 meters per second^2
Source: Algermissen et al. 1982, 1990.

MINE ROCK CHARACTERIZATION

The majority of gold ore mined in the Carlin Trend has been from oxide ore zones. As mining progresses through oxide ore zones, refractory (sulfide-rich or carbonaceous) material is often encountered at depth. Sulfide-rich rock has the potential to produce acid upon exposure to water and oxygen; mineralized rock also has the potential to release regulated trace elements, under both acid and alkaline conditions. Newmont's operational monitoring and management plans for rock with the potential to affect water quality are summarized in Chapter 2 – *Waste Rock Disposal Facility*.

The lithology of rocks in the Pete Project area include micrite and silty micrite from the Popovich Formation, silicified sand and silt of the Rodeo Creek formation, and silty mud and limestone of the Roberts Mountains formation.

Newmont has completed Net Carbonate Value (NCV) and Meteoric Water Mobility Procedure (MWMP) tests to characterize the rock in the Project area. NCV analyses were conducted on representative samples taken from exploration drill cuttings collected throughout the Pete Project area, with analysis of sulfur and carbonate content.

Based on NCV analyses of waste rock, which compare acid generation potential (AGP, based on sulfide sulfur content), with acid neutralization potential (ANP), waste rock from the Pete Project is not expected to be acid generating (**Table 3-2**). Waste rock produced from the Pete and Castle Reef pits would be moderately to strongly net-neutralizing, but much of the waste rock produced from the smaller Crow pit would be refractory sulfide waste rock. Rock mined from the Crow pit is only weakly acidic, based on available static test data, but the ANP/AGP ratios for this rock are below the regulatory ANP/AGP criteria of 1.2:1 (NDEP) and 3:1 (BLM) and therefore indicate an uncertain potential to generate acid.

TABLE 3-2
Waste Rock Characterization
Pete Project

Waste Rock Type	Ktons	ANP %CO_3	AGP %CO_3	NCV %CO_3	ANP/AGP	Potentially Acid Producing
Pete Mine Pit						
Oxide	68,540.118	12.28	-0.36	11.92	33.8	Non-PAG
Unoxidized	6,154.37	0.80	-1.00	-0.2	0.8	PAG
Crow Mine Pit						
Oxide	45.507	11.75	-0.29	11.5	40.8	Non-PAG
Unoxidized	6,694.846	0.63	-0.8	-0.2	0.8	PAG
Castle Reef Mine Pit						
Oxide	1,919.46	11.75	-0.29	11.50	40.8	Non-PAG
Unoxidized	0	--	--	--	--	
Total Oxide n=1361	70,505.085	12.27	-0.36	11.9	33.9	Non-PAG
Total Unoxidized n= 2057	12,849.216	0.71	-0.9	-0.2	0.8	PAG
Total	83,354.301	10.48	-0.45	10.0	23.1	Non-PAG

Note: Oxide carbonate and oxide siliceous are combined as oxide waste in this table. The same is true for unoxidized carbonate and siliceous waste.
Ktons = 1,000 tons; ANP = Acid-Neutralizing Potential; AGP = Acid-Generating Potential; NCV=Net Carbonate Value. PAG = Potentially Acid-Generating. n = number of samples
Source: Newmont 2002a.

Newmont has also completed MWMP tests for four composited samples of waste rocks from the proposed Pete pit, two composites of unoxidized sulfide waste rock from the Crow pit, and one composite sample of oxide waste rock from the proposed Castle Reef pit (Newmont 2002a). The composites were developed from multiple intervals in several borings, and were determined by project geologists to represent the full range of lithologies and mineralization to be mined from each pit based on logs and assayed parameters, including sulfur and carbonate content. For the four composites from Pete, total metal analyses based on aqua regia digestion followed by laboratory analysis were also completed, as summarized in **Table 3-3**.

Review of MWMP data indicated a potential for release of some trace elements in leachate from both unoxidized carbonate and unoxidized siliceous waste rock. Unoxidized carbonate waste rock composite has the potential to release total dissolved solids (TDS), sulfate (SO_4), and selenium (Se). Unoxidized siliceous material has the potential to release aluminum (Al), cadmium(Cd), manganese (Mn), nickel (Ni), zinc (Zn), sulfate, TDS, iron (Fe), selenium (Se), and thallium (Tl), in excess of water quality standards.

Baseline geochemistry results indicate that a portion of the waste rock to be generated by mining the Pete Project has the potential to release trace metals in excess of applicable water quality standards. Although the potential to form acid rock drainage is low on a run-of-mine basis, approximately 18 percent of the total waste rock volume is potentially acid generating and has potential to release elevated concentrations of regulated trace elements. Although these zones are readily identifiable based on NCV analyses, the available MWMP analyses of composites are not conclusive in terms of identifying the locations within each waste rock type with potential to release significant trace element concentrations.

TABLE 3-3
Whole Rock Analytical Results for Waste Composites
Pete Project

Composite	Trace elements (mg/kg)										
	Sb	Cd	Mn	Ni	Se	As	Ba	S%	Ca%	Mg%	Al%
PETE TAB1 Oxide Carbonaceous	17.85	2.61	315	62.0	2.6	150.0	1359.0	0.12	>15.00	1.36	0.34
PETE TAB2 Oxide Siliceous	17.95	0.96	55	10.4	4.0	87.5	994.5	0.12	0.34	0.07	0.43
PETE TAB3 Unoxidized Carbonaceous	9.2	0.73	245	40.2	5.4	130.0	134.0	1.35	>15.00	4.34	0.28
PETE TAB4 Unoxidized Siliceous	17.4	15.25	40	45.6	6.4	49.2	118.0	1.03	0.21	0.04	0.52

Sb – antimony; Se – selenium; Ca – calcium; Cd – cadmium; As – arsenic; Mg – magnesium; Mn – manganese; Ba – barium; Al – aluminum; Ni – nickel; S - sulfur

Source: Newmont 2002a.

AIR QUALITY

METEOROLOGY

The Pete Project area is subject to large daily temperature fluctuations, low relative humidity, and limited cloud cover. Wind data collected at Newmont's North Area Leach Facility, located approximately two miles from the Pete Project, indicate the most common wind direction is from the southeast but is influenced by daily heating and cooling of hills and drainage areas. Local topographic features frequently cause wind to flow in the direction of the valley (also known as drainage wind). Average wind speed recorded at that station is 8.4 miles per hour.

The Tuscarora Mountains rise approximately 7000 feet amsl to the west of the Project area and the Independence Mountains are to the east. In the evenings, cool mountain airflow is down slope across the Project area. As temperatures increase after sunrise, warm valley air rises up the slope until midday, when ground heating causes instability and variable wind directions.

TEMPERATURE AND PRECIPITATION

General meteorological conditions in the Project area are represented by data collected by the Western Regional Climate Center in several nearby locations. The Elko municipal airport is located approximately 30 miles east of the Project area and is the nearest meteorological station with an extended period of record. Meteorological data are also available from stations at the Newmont Carlin Mine (2.5 miles northwest), Emigrant Pass Highway Station (16 miles south) and Tuscarora (28 miles north). Average monthly temperature and precipitation data from these sites provide a description of general weather patterns in the region (**Table 3-4**).

TABLE 3-4
Pete Project Area Temperature and Precipitation

Station	Elevation (feet)	Period of Record		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Ann.
Average Maximum, Average Minimum, and Mean Temperature (degrees F)																
Newmont Carlin Mine, Nevada	6520	1966-2000	Max	34.6	38.5	44.4	51.7	61.8	72.6	83.0	82.8	71.9	59.0	43.3	34.9	56.5
			Min	19.7	22.7	26.3	31.3	39.6	49.0	58.2	58.2	48.0	37.9	27.1	19.7	36.5
			Mean	27.1	30.6	35.3	41.4	50.6	60.8	70.6	70.5	60.0	48.4	35.3	27.3	46.5
Elko Municipal Airport, Nevada	5050	1888-2000	Max	36.9	42.7	50.9	60.1	69.3	79.9	90.9	88.8	78.7	65.9	50.3	39.1	62.8
			Min	10.7	17.4	23.5	28.9	35.5	42.0	47.8	45.4	36.4	27.8	20.3	12.9	29.0
			Mean	23.8	30.0	37.2	44.5	52.4	61.0	69.4	67.1	57.5	46.9	35.3	26.0	45.9
Emigrant Pass Hwy Stn, Nevada	5760	1954-2000	Max	37.9	42.1	48.9	56.5	66.6	78.1	89.2	86.4	76.8	64.5	48.0	38.2	61.1
			Min	18.5	22.3	26.7	31.4	38.6	46.8	55.6	53.3	44.8	34.5	26.0	19.1	34.8
			Mean	28.1	32.2	37.8	44.0	52.6	62.4	72.4	69.8	60.8	49.4	36.9	28.6	47.9
Tuscarora, Nevada	6170	1957-2000	Max	36.8	39.8	45.2	53.1	62.9	73.5	84.2	83.2	72.8	61.8	45.4	38.1	58.1
			Min	16.3	19.4	23.4	28.1	35.0	42.2	49.5	48.2	39.9	32.0	23.5	17.9	31.3
			Mean	26.6	29.6	34.3	40.7	48.9	57.9	66.8	65.8	56.3	46.9	34.4	27.9	44.7
Mean Monthly Precipitation (inches)																
Newmont Carlin Mine, Nevada	6520	1966-2000		1.18	0.97	1.26	1.11	1.30	1.13	0.40	0.46	0.98	0.96	1.13	1.58	12.46
Elko Municipal Airport, Nevada	5050	1888-2000		1.20	0.95	0.92	0.80	0.99	0.80	0.36	0.40	0.45	0.71	0.91	1.07	9.55
Emigrant Pass Hwy Stn, Nevada	5760	1954-2000		1.32	0.97	1.25	1.20	1.50	1.15	0.31	0.47	0.63	0.85	1.21	1.17	12.02
Tuscarora, Nevada	6170	1957-2000		1.27	0.99	1.11	0.87	1.46	1.21	0.53	0.47	0.79	0.93	1.42	1.47	12.52

Source: Western Regional Climate Center 2002.

Table 3-4 also shows mean monthly precipitation data for the four stations. Mean annual precipitation for the period of record varied from 9.55 inches at Elko to 12.52 inches at Tuscarora. Heaviest precipitation amounts fall as snow during November, December, and January. Summer precipitation occurs mostly as scattered showers and thunderstorms.

AIR QUALITY

State and federal agencies have established ambient air quality standards for criteria air pollutants. The criteria pollutants are carbon monoxide (CO), lead (Pb), sulfur dioxide (SO_2), particulate matter smaller than 10 microns (PM_{10}), ozone, and nitrogen dioxide (NO_2). Ambient air quality standards must not be exceeded in areas where the general public has access. **Table 3-5** lists federal and Nevada air quality standards.

National primary standards are levels of air quality necessary, with an adequate margin of safety, to protect public health. National secondary standards are levels of air quality necessary to protect public welfare from known or anticipated adverse effects of a regulated air pollutant.

These standards, other than for ozone and those based on annual averages, must not be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.

Attainment status for pollutants within the project area is determined by monitoring levels of criteria pollutants for which National Ambient Air Quality Standards (NAAQS) and Nevada Ambient Air Quality Standards exist. Air quality in Eureka and Elko counties is classified as attainment or unclassified for all criteria pollutants. A non-attainment designation means that no violations of state or federal air quality standards have been documented in the region.

In 1997, the U.S. Environmental Protection Agency (USEPA) revised federal primary and secondary particulate matter standards by establishing annual and 24-hour standards for particles 2.5 micrometers in diameter or smaller ($PM_{2.5}$). States will be required to submit attainment designations for each $PM_{2.5}$ area within one year after receipt of three years of air quality data, expected to be available in 2002-2003. Significant technical difficulties still exist with respect to $PM_{2.5}$ monitoring, emission estimation, and modeling. Until these difficulties are resolved, PM_{10} may be used as a surrogate for $PM_{2.5}$ in meeting new source review permitting requirements.

AIR QUALITY MONITORING DATA

PM_{10} ambient air quality data have been collected at three monitoring stations near the Project area. Two stations are in Battle Mountain, Nevada and the third station is in Elko, Nevada. **Table 3-6** lists available air quality monitoring data for the area near the Project site. The period of record varies for each monitoring station as listed below. Air quality violations have not been recorded at any of the stations.

PSD CLASSIFICATION

The area surrounding the proposed Pete Project is designated Class II as defined by the Federal Prevention of Significant Deterioration of Air Quality (PSD) program. The PSD Class II designation limits increases in ambient concentrations of NOx, SO_2 and PM_{10} up to the maximum allowable increase above baseline air quality. The maximum allowable increases are referred to as the "PSD Increments" and are listed in **Table 3-7**. Industrial sources proposing construction or modifications must demonstrate that proposed emissions would not cause impacts exceeding the applicable PSD Increments. Standards for significant deterioration are more strict for Class I areas than Class II areas.

The nearest Class I area is the 64,667 acre Jarbidge Wilderness, located approximately 70 miles northeast of the Project area. The Jarbidge Wilderness contains rugged, glaciated mountainous terrain. The Jarbidge Mountains form a single crest and maintain elevations between 9,800 and 11,000 feet amsl for approximately 7 miles. As a federal mandatory Class I area, the Jarbidge Wilderness receives visibility protection through the PSD air quality permitting process. There are no designated Integral Vistas associated with the Jarbidge Wilderness.

TABLE 3-5 State of Nevada and National Ambient Air Quality Standards			
Pollutant	**Averaging Time**	**Concentration**	**Comments**
Ozone	1 Hour	235 µg/m³ (0.12 ppm)	National Primary and Secondary Standard and Nevada Std.
Ozone – Lake Tahoe Basin, #90	1 Hour	195 µg/m³ (0.10 ppm)	Nevada Std. only
Carbon Monoxide, below 5000 ft. M.S.L.	8 Hours	10,000 µg/m³ (9.0 ppm)	National Primary Std. and Nevada Std.
Carbon Monoxide, at or above 5000 ft. M.S.L.	8 Hours	6,670 µg/m³ (6.0 ppm)	Nevada Std. only
Carbon Monoxide, all elevations	1 Hour	40,000 µg/m³ (35 ppm)	National Primary Std. and Nevada Std.
Nitrogen Oxides	Annual Arithmetic Mean	100 µg/m³ (0.05 ppm)	National Primary and Secondary Std. and Nevada Std.
Sulfur Dioxide	Annual Arithmetic Mean	80 µg/m³ (0.03 ppm)	National Primary Std. and Nevada Std.
	24 Hours	365 µg/m³ (0.14 ppm)	National Primary Std. and Nevada Std.
	3 Hours	1,300 µg/m³ (0.5 ppm)	National Secondary Std. And Nevada Std.
Particulate Matter as PM_{10}	Annual Arithmetic Mean	50 µg/m³	National Primary and Secondary Std. and Nevada Std.
	24 Hours	150 µg/m³	National Primary and Secondary Std. and Nevada Std.
Particulate Matter as $PM_{2.5}$	Annual Arithmetic Mean	15 µg/m³	National Primary and Secondary Std.
	24 Hours	65 µg/m³	National Primary and Secondary Std.
Lead (Pb)	Quarterly Arithmetic Mean	1.5 µg/m³	National Primary and Secondary Std. and Nevada Std.
Visibility	Observation	In sufficient amount to reduce the prevailing visibility to less than 30 miles when humidity is less than 70%.	Nevada Std. only
Hydrogen Sulfide	1 Hour	112 µg/m³ (0.08 ppm)	Nevada Std. only

Note: µg/m³ = micrograms per cubic meter; ppm = parts per million; M.S.L. = mean sea level
Source: NDEP 2002.

TABLE 3-6 PM_{10} Monitoring Data				
Site	**Year**	**Annual Geometric Mean (µg/m³)**	**24-Hour High (µg/m³)**	**24-Hour 2nd High (µg/m³)**
#0002 City of Battle Mountain #1	1990	47.9	225	127
	1991	29.8	65	56
	1992	30.5	83	46
	1993	---	---	---
	1994	33.5	95	66
	1995	34.4	95	65
	1996	41.3	244	91
	1997	31.8	83	64
	1998	29.5	164	64
#0004 City of Battle Mountain #2	1998	18.0	75	67
	1999	23.8	136	120
	2000	21.8	127	91
	2001	12.6	27	25
#0004 City of Elko #1	1993	28.8	79	66
	1994	31.3	87	59
	1995	35.4	75	74
	1996	32.3	119	107
	1997	24.8	49	48
	1998	21.8	103	65
	1999	28.9	115	93
	2000	28.0	98	91

Note: µg/m³ = micrograms per cubic meter
Source: USEPA 2002.

TABLE 3-7 PSD Class II Increments			
Pollutant	**Averaging Time**	**Concentration**	**Comments**
Nitrogen Dioxide	Annual Arithmetic Mean	25 µg/m³	Never to be exceeded
Sulfur Dioxide	Annual Arithmetic Mean	20 µg/m³	Never to be exceeded
	24 Hours	91 µg/m³	Not to be exceeded more than once per year
	3 Hours	512 µg/m³	
Particulate Matter as PM_{10}	Annual Arithmetic Mean	17 µg/m³	Never to be exceeded
	24 Hours	30 µg/m³	Not to be exceeded more than once per year.

Source: 42 U.S.C. 7473, §163.

Two other wilderness areas are located in the Humboldt National Forest southeast of the Project area: East Humboldt Wilderness and Ruby Mountain Wilderness. Neither of these wilderness areas are mandatory federal Class I air sheds. The BLM manages 10 Wilderness Study Areas in the Elko District, seven of which are recommended for wilderness designation. None of these Wilderness Study Areas are mandatory Class I air sheds (BLM 1987).

WATER QUANTITY AND QUALITY

SURFACE WATER

The Pete Project area is situated in the Maggie Creek Basin (Hydrographic Area No. 51) as designated by the State of Nevada. The Pete Project area would result in land disturbance to east-west trending ridges and coulees on the east side of the Tuscarora Mountains. Most streams in the Project vicinity are ephemeral – flowing only in response to snow melt run-off or major precipitation events. Some streams are intermittent where segments of the stream flow for longer periods due to influence from groundwater, especially in the headwater reaches of the mountains. Surface water drainage from the Project site, when present, enters ephemeral channels that drain east to Simon Creek (**Figure 3-6**). Simon Creek is located approximately 5,000 to 7,000 feet east of the Project site. This creek is also located approximately 1,000 to 2,000 feet north of the Project site; however, a topographic ridge separates Simon Creek from the Project site in this area.

Simon Creek joins Maggie Creek approximately 4 miles southeast of the Project site. Newmont monitors Simon Creek at two sites: (1) Simon-0, located near the upper end of the creek approximately 1 mile northeast of the Pete Project; and (2) Simon-1, located near its mouth below the confluence with Lynn Creek (**Figure 3-6**). The Simon-1 station is also monitored by the U.S. Geological Survey (USGS 2000: designated station no. 10321925). Monitoring by the USGS at this station began in December 1996. Mean annual flow in 1997, 1998, 1999, and 2000 was 1.92, 1.84, 0.79, and 0.65 cubic feet per second (cfs), respectively (USGS 1998, 2000; Newmont 2001c). Mean monthly flows for January through December for the period of record are: 2.15, 1.76, 3.52, 2.05, 1.92, 1.05, 0.52, 0.41, 0.48, 0.58, 0.66, and 0.90 cfs, respectively (USGS 2000, Newmont 2001c). Flow rate at the upper Simon-0 station is intermittent, typically less than 0.1 cfs, with annual peak flows of 0.5 to 1.0 cfs or more (Newmont 2001c).

Quality of water in Simon Creek has been characterized from samples collected by Newmont (2001c) since 1993 for laboratory analysis. This creek is calcium-sodium bicarbonate type water, with concentrations of sulfate and chloride less than 100 milligrams per liter (mg/l) since 1997 (previous samples generally had higher concentrations). The pH is neutral (7.2 to 8.8), specific conductance typically is between 500 and 900 micromhos/centimeter (µmhos/cm), and total suspended solids (TSS) is usually less than 30 mg/l. Concentrations of metals generally are low or below laboratory detection levels. Arsenic typically is in the range of 0.01 to 0.04 mg/l.

SPRINGS AND SEEPS

Several springs/seeps have been identified in the Pete Project area (**Figure 3-7**). Information about these springs/seeps are presented in **Table 3-8**. With the exception of spring SP-1, all springs/seeps in the vicinity of the Pete Project site are at elevations below 6,000 feet amsl (5,400 to 5,800 feet). Selected springs are monitored once or twice per year (Spring and/or Fall) by Newmont as part of the Maggie Creek Basin Monitoring Plan. Most flow rates measured at the spring sites are less than 6 gallons per minute (gpm) (**Table 3-8**). Three flow measurements of SP-1, located in the Simon Creek drainage bottom, range from 15 to 60 gpm during the Spring, likely due to influence from surface runoff in the watershed.

Only springs SP-1, SP-2, SP-3, and SP-73 have had measurable flow in both Spring and Fall. These four springs are located as follows: SP-1 is located in the upper Simon Creek drainage bottom and about ¾-mile upgradient (northwest) from the proposed Pete Project site; SP-2 and SP-3 are located within ¼-mile downgradient (southeast) of the proposed Pete South Waste Rock Disposal Facility; and SP-73 is located in an ephemeral drainage about ¼-mile north-northeast of the proposed Pete pit and South Waste Rock Disposal Facility (**Figure 3-7**). Spring SP-56 is located immediately east of the proposed waste rock facility, but has had no measurable flow. Two seeps (SP-74 and SP-75) are located within the footprint of the proposed Pete South Waste Rock Disposal Facility (**Figure 3-7**). These sites, however, are only wet in the spring and become dry early in the summer. SP-72 is located immediately down-slope (southeast) from the proposed Crow pit in the bottom of an ephemeral drainage. This seep also is wet only in the spring when sufficient recharge occurs seasonally in this area.

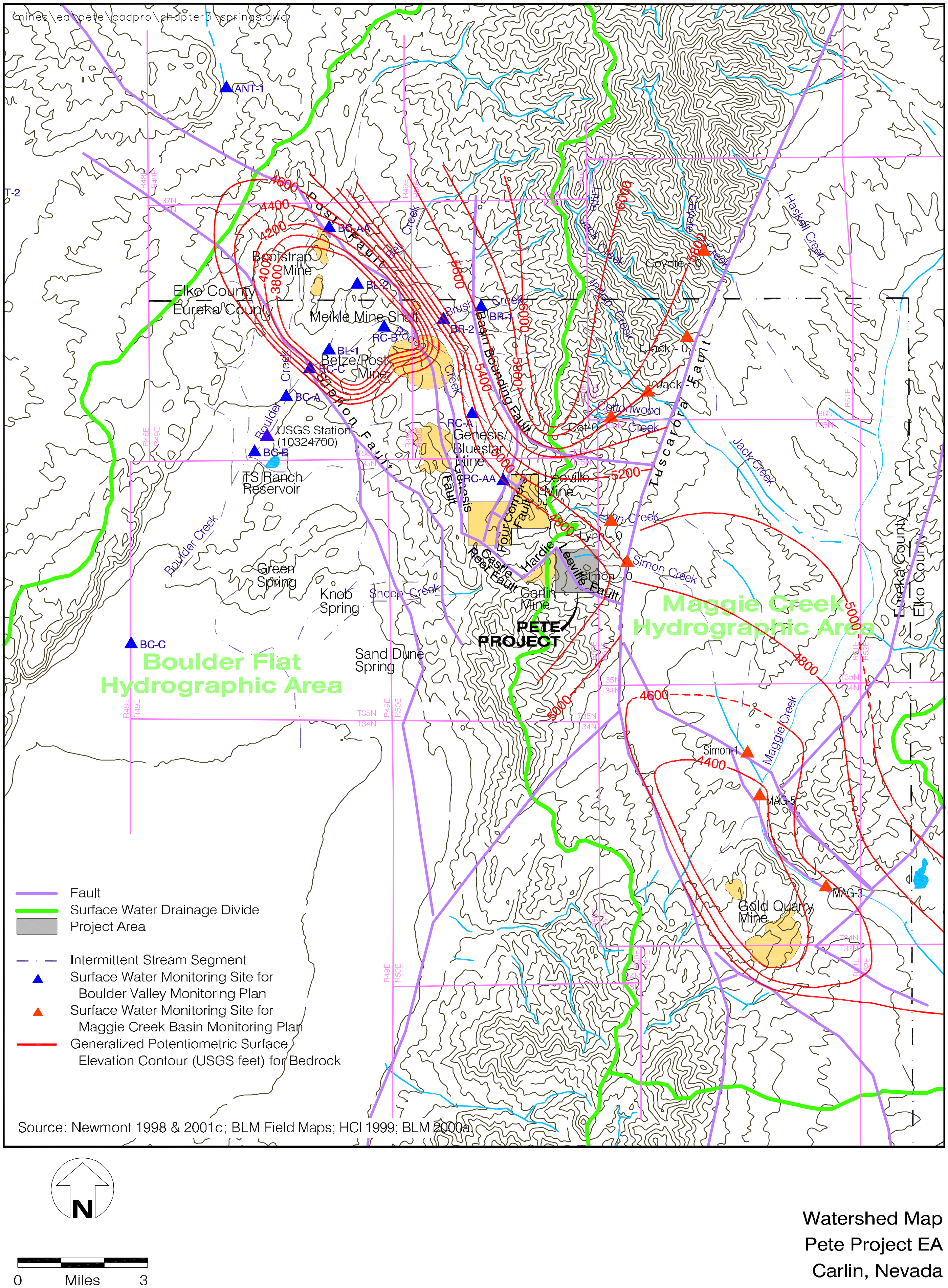
Most springs listed in **Table 3-8** were sampled and field-analyzed for pH, specific conductance (SC), dissolved oxygen (DO), temperature, and flow rate (Newmont 2001c). The parameters of pH and SC are included in **Table 3-8**. Based on the period of record, the following ranges were measured: pH = 6.5 to 9.9 standard units; SC = 75 to 5,100 µmhos/cm; DO = 2 to 13 mg/l; and temperature = 4 to 23 degrees Centigrade (ºC).

In addition to field parameters, samples collected from SP-1 in 1991-98 have been analyzed for common ions, nutrients, and metals. These analyses show concentration ranges of the following selected parameters (Newmont 2001c): SC = 380 to 4,000 µmhos/cm; TDS = <1 to 3,620 mg/l; TSS = 3 to 276 mg/l; hardness = 1,210 to 1,750 mg/l; sulfate = 140 to 780 mg/l; nitrate = 7 to 23 mg/l; arsenic = 0.009 to 0.158 mg/l; cadmium = 0.006 to 0.02 mg/l; iron = 0.04 to 1.48 mg/l; and manganese = 0.05 to 0.45 mg/l.

TABLE 3-8
Springs and Seeps in Pete Project Area

Spring & Map No.[1]	Legal Location[2] and Elevation[3]	Monitoring Period	Flow Rate (gpm)[4]	Development	pH (std. Units)	SC (µmhos/cm)
SP-1	T35N,R50E,S13,NENW 6080 feet	1990 – 2001	0 – 60	Collection Box	6.5 – 9.0	450 – 5,100
SP-2	T35N,R51E,S30,SESE 5560 feet	1990 – 2001	0 – 1	Pond, tank, piping	6.5 – 9.9	76 – 1,020
SP-3	T35N,R51E,S32,NWNW 5420 feet	1990 – 2001	0 – 6	Pond, tank, piping	6.5 – 9.8	80 – 534
SP-56	T35N,R51E,S30,SWSE 5640 feet	1993 – 2001	0	None	---	---
SP-72	T35N,R50E,S13,SENE 5800 feet	1998 – 2001	0	None	6.5	3,290
SP-73	T35N,R51E,S19,NWSE 5600 feet	1998 – 2001	0.4 – 3	Pond & piping	6.4 – 8.1	424 – 869
SP-74	T35N,R51E,S30,NWSE 5660 feet	1999 – 2001	0 – 5	None	8.1	225
SP-75	T35N,R51E,S30,SWNE 5660 feet	1999 – 2001	0	None	---	---

[1] See **Figure 3-7** for location of springs.
[2] T = Township; R = Range; S = Section; NE = northeast; NW = northwest; SE = southeast; SW = southwest.
[3] Elevation in feet above mean sea level (amsl).
[4] gpm = gallons per minute; std. = standard; µmhos/cm = micromhos/centimeter. A value of "0" flow rates means there may still be water present or ground is moist, but there was no discernable flow.
Source: Newmont 2001d, 2002b.



Watershed Map
Pete Project EA
Carlin, Nevada
FIGURE 3-6

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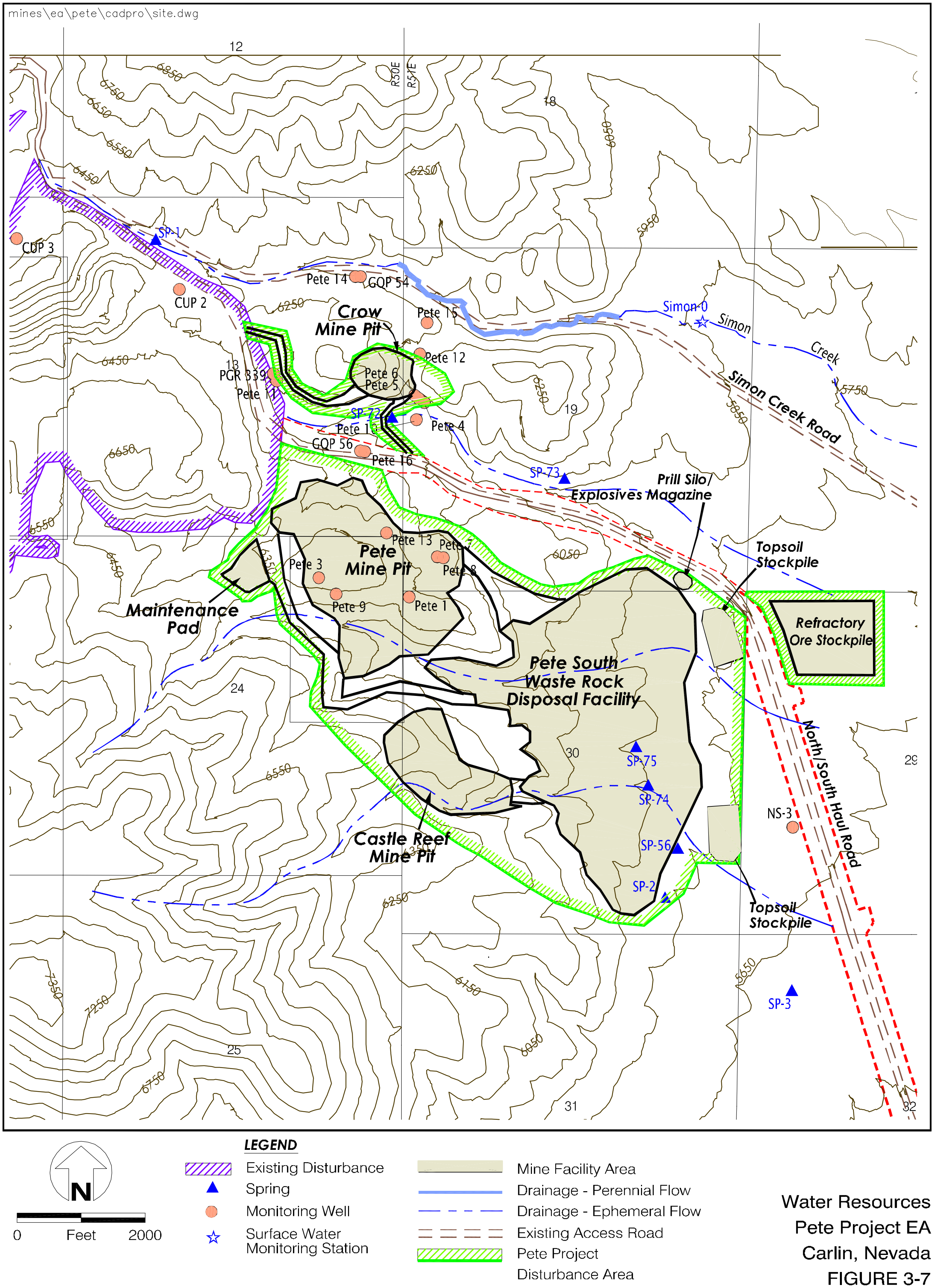

Water Resources
Pete Project EA
Carlin, Nevada
FIGURE 3-7

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GROUNDWATER

In the Pete Project area, groundwater in bedrock generally flows north-northwest on west side of the Tuscarora Fault and east-southeast on east side of the fault (**Figure 3-6**). Dewatering at the Goldstrike Property (i.e., Betze/Post Mine) influences groundwater movement west of the Tuscarora Fault; whereas dewatering at the Gold Quarry Mine has created a drawdown area east of the Fault (**Figure 3-6**). Groundwater recharge in the Pete Project area is principally associated with precipitation in the Tuscarora Mountains to the north and west of the site. A groundwater divide in upper plate rocks is coincident with the crest of this mountain range north of the Pete site (**Figure 3-6**).

Major hydrostratigraphic units are grouped into the Upper Plate (siltstone – Vinini Formation) and Lower Plate (carbonate – Rodeo Creek, Popovich, and Roberts Mountains Formations) regional aquifers or hydrostratigraphic units. The groundwater divide mentioned above is in the Upper Plate unit. Major structures in the Project area include Roberts Mountains Thrust, Leeville, Castle Reef, Wet, and Crow faults (**Figure 3-4** and **3-5**). Perched water zones were encountered in some wells completed in Lower Plate rocks during the groundwater investigation completed by Newmont (1998).

Several monitoring wells or piezometers have been completed in the Pete Project area (**Figure 3-7** and **Table 3-9**). Three piezometers (CUP-1–abandoned, CUP-2, and CUP-3) were installed in 1994, five piezometers (GQP-54, GQP-56, Pete-1, Pete-2–abandoned, and Pete-3) were completed in 1995-96, and an additional 13 piezometers (Pete-4 through Pete-16) were constructed in 1997. Of the 20 piezometers, nine are completed in the Upper Plate hydrostratigraphic unit and eight are in the Lower Plate hydrostratigraphic unit. Piezometer Pete-12 is screened across both hydrostratigraphic units.

Piezometer Pete-10 is completed in relatively thin (40 feet) alluvium in an ephemeral drainage that extends between the proposed Pete and Crow pits. Water level measurements in Pete-10 show that about 20 feet of unconsolidated alluvial material is saturated. This piezometer is located near Seep-72 (SP-72), indicating that alluvial groundwater may be the source for this seep. Another monitoring well (NS-3) is completed in thicker (600+ feet) alluvium/colluvium downgradient (east) of the proposed Pete South Waste Rock Disposal Facility. Depth to water measured in NS-3 is approximately 150 feet below ground surface.

TABLE 3-9
Monitoring Wells and Piezometers in Pete Project Area

Well ID	Date Installed	Well Depth (feet)	Screen Interval (feet)	Depth to Water (feet)	Water Level Elevation (feet) & Date Measured
Upper Plate					
CUP-2	1994	425	390 – 410	100	6189 (11/01)
CUP-3	1994	400	380 – 400	272	6271 (11/01)
PETE-4	1997	600	580 – 600	Dry	Dry
PETE-5	1997	110	90 – 110	88	5698 (8/01)
PETE-6	1997	350	330 – 350	279	5507 (8/01)
PETE-11	1997	350	330 – 350	114	5842 (8/01)
PETE-12*	1997	400	380 – 400	393	5515 (8/98)
PETE-14	1997	378	358 – 378	88	5841 (8/01)
PETE-15	1997	378	358 – 378	369	5601 (8/00)
PETE-16	1997	135	115 – 135	127	5985 (10/01)
Lower Plate					
PETE-1	1996	600	580 – 600	Dry	Dry
PETE-3	1996	350	330 – 350	347	5853 (6/99)
PETE-7	1997	393	373 – 393	Dry	Dry
PETE-8	1997	200	180 – 200	195	5813 (8/01)
PETE-9	1997	298	278 – 298	Dry	Dry
PETE-13	1997	758	738 – 758	Dry	Dry
GQP-54	1995	Unknown	Unknown	992	5154 (5/98)
GQP-56	1996	1020	980 – 1020	1,018	4874 (2/00)
Alluvium/Colluvium					
PETE-10	1997	40	20 – 40	21	5744 (8/01)
NS-3	1994	640	330 – 630	140	5328 (1/02)

Note: See **Figure 3-7** for well locations. Asterisk (*) for well Pete-12 indicates that this well is screened in both the Upper and Lower Plates, but likely represents groundwater elevations for the Upper Plate.
Source: Newmont 1998, 2001c.

The presence and movement of groundwater in the Project area is influenced by structural and stratigraphic controls, including the Roberts Mountains Thrust and Crow Fault (**Figure 3-3**). Cross-sections through the Pete Project site (**Figures 3-4** and **3-5**) show that most piezometers completed in the Lower Plate unit within the proposed Pete pit have been dry since they were installed in 1996-97. This indicates that groundwater in the Lower Plate typically is lower than 5300 feet in elevation in the Project area. Two piezometers (Pete-3 and Pete-8) completed in the Lower Plate had water elevations of about 5810 to 5850 feet amsl in the proposed Pete pit site. These saturated zones likely represent perched groundwater. Most piezometers completed immediately north of the proposed Pete pit and above the Roberts Mountains Thrust (Pete-4, -5, -6, -11, -12, and -16) have water at elevations ranging from about 5500 to 6000 feet amsl in the Upper Plate hydrostratigraphic unit.

Perched groundwater intercepted in wells Pete-3 and Pete-8 in the proposed Pete Mine area is isolated from regional perched flow systems due to differences in geology and numerous faults bounding the area (**Figure 3-3**). Perched water in the Pete Mine area is in Lower Plate rocks; whereas, perched water north of the site in the Tuscarora Mountains is associated with Upper Plate or mountain block rocks. Perched water at the Pete Mine appears to be isolated within intersections of faults (**Figure 3-3**). This condition is also evidenced by locations of dry wells near Pete-3 and Pete-8 (Pete-9 and Pete-7, respectively), all completed in the Lower Plate unit. In addition, regional perched groundwater flow systems north of the Pete Project site generally are at elevations of 6,000 feet or higher; whereas, water level elevations in wells in the Pete Project area are lower than 6,000 feet (except CUP-2 and CUP-3 located west of the mine site; **Table 3-9** and **Figure 3-7**).

One piezometer pair located immediately north of the proposed Pete pit (Pete-16 and GQP-56) shows the difference in groundwater elevation between Upper and Lower Plates. Piezometer Pete-16, completed in the Upper Plate, has a water level elevation of 5985 feet amsl; whereas, adjacent piezometer GQP-56, completed in the Lower Plate, has a water level elevation of about 4874 feet amsl, a difference of over 1,100 feet (**Table 3-9**).

Based on groundwater studies in the Carlin Trend, pre-dewatering groundwater elevation in the Lower Plate hydrostratigraphic unit is estimated at approximately 5270 feet amsl (Newmont 2001a). Pre-dewatering elevation difference of groundwater between Upper and Lower Plates was about 700 feet. Cumulative dewatering in the Carlin Trend has lowered Lower Plate groundwater an additional 400 feet, resulting in the current difference in water levels of about 1,100 feet between the Upper and Lower Plates. In piezometer GQP-54 (Lower Plate), the water level declined at a consistent rate of about 50 feet/year during a 2-year monitoring period in 1996-97 (Newmont 1998).

An airlift drawdown test was conducted in an exploration borehole (PGR-339) located near piezometer Pete-11 (**Figure 3-7**), both of which are completed in the Vinini Formation (Upper Plate). Water level response was measured in Pete-11, which is 110 feet southeast of PGR-339. Calculated transmissivity and storage coefficient from the test are 1,100 $feet^2$/day and $1.5x10^{-5}$, respectively (Newmont 1998). These results indicate that the Upper Plate hydrostratigraphic unit has a moderate permeability and is under confined or semi-confined conditions.

Groundwater in bedrock formations in the Pete Project area generally is classified as calcium-bicarbonate type. No wells are routinely sampled for water quality analysis in the Pete Project area; however, groundwater quality is monitored in adjacent mine areas including the Gold Quarry Mine, and proposed Leeville Project. Well SIC-1, located in the Simon Creek drainage approximately 2 miles east of the Pete Project site, has been periodically sampled since 1992. This well is completed to a depth of 230 feet in the Tertiary-age Carlin Formation. Typical concentrations of the following parameters have been measured in samples from SIC-1: pH = 7.0 to 8.0 su; SC = 300 to 500 µmhos/cm; sulfate = 20 to 30 mg/l; nitrate = below detection limit; arsenic = <0.005 to 0.07 mg/l (Newmont 2001c).

SOIL

The Pete Project area has landforms typical of the Basin and Range Province, with isolated, north-south trending, tilted, fault-block mountain ranges rising abruptly above large alluvium-filled desert basins. The mountain ranges, modified by recurring erosion and deposition cycles, consist of exposed sedimentary, metamorphic, and volcanic rock. Soil has formed on landforms dominated by gently to steeply sloping mountains and uplands, fans, piedmont fans, alluvial flats and terraces, alluvial plains, and remnant land surfaces. The deepest and most developed soil occurs on alluvial valley bottoms and convex upland slopes. The youngest and often shallowest soil has formed in recently deposited materials or in parent material recently exposed by erosion (University of Nevada 1981; USDA 1980).

Soil within the proposed Project area have been mapped and are described in greater detail in the Soil Survey of Tuscarora Mountain Area, Nevada (USDA 1980). Seven soil map units occur within the proposed Project area and are shown on **Figure 3-8.** Each map unit has one or more major soil components and several contrasting inclusions. **Appendix A** contains detailed characteristics of the specific series and associations of soil that would be disturbed in the Project area.

Soil within the Project area is loam with textures ranging from silt to gravel to cobble and are formed in alluvium, residuum, or loess parent material. Soil within the Project area has moderate permeability and low available water-holding capacity. The Taylor Creek-Chen and Slaven-Torro associations in the western portion of the Project area generally have a high hazard of water erosion and a slight hazard of wind erosion. This soil association occurs on greater slopes in the landscape than the Donna-Simon and Cherry Spring-Cortez-Tomera associations found in the eastern portion of the Project area. The Donna--Simon and Taylor Creek-Chen associations would be the primary soil disturbed by the Proposed Action. The Ramires-Chen-Bobs and Slaven-Torro associations are slightly within the area to be affected by the Proposed Action. The Cluro silt loam, drained map unit, Cherry Spring-Cortez-Tomera Association, Coff-Denay Association, Chen-Pie Creek-Ramires Association, Donna-Stampede Association, and Slaven-Torro Association are within the Project boundary but outside proposed disturbances.

VEGETATION

Vegetation in the Project area reflects historic and ongoing disturbance by mining, grazing, and fire. Areas cleared of sagebrush, either mechanically or by wildfire, have generally converted to annual plant communities dominated by cheatgrass, unless previously seeded to adapted wheatgrass species. Riparian vegetation is sparse and infrequent with some willows or herbaceous riparian species along ephemeral drainages.

Vegetation in the Pete Project area is typical of upland Great Basin plant communities and is dominated by sagebrush steppe communities, with limited riparian vegetation bordering drainages, springs, and seeps. On north- and east-facing slopes, the dominant plant community is composed of big sagebrush, bluebunch wheatgrass, Thurber needlegrass, Sandberg's bluegrass, and other grasses and forbs. On the drier western and southern slopes, big sagebrush becomes sparse or absent and grasses and forbs predominate (Cronquist et al. 1972).

A mountain-brush vegetative community, dominated by serviceberry occurs in the southwest quadrant of the Project area. This mountain brush community is an important habitat type for numerous wildlife species including mule deer. In moist coulee bottoms, generally with deeper soil, western wheatgrass and Great Basin wildrye become prevalent. No tree-dominated communities are present in the Project area.

WETLAND/RIPARIAN AREAS

In July 2000, Brown and Caldwell conducted a delineation of wetlands and survey of Waters of the United States (WUS) for the Pete Project area. The Brown and Caldwell (2000) report has been submitted to the U.S. Army Corps of Engineers (COE); however, a response has not been received from the COE regarding designation of jurisdictional wetlands and WUS. The three ephemeral drainages that extend through the Pete Project area (**Figure 3-7**) were identified as WUS because of defined channel bed and bank. Total WUS acreage for the three primary ephemeral drainage channels within the project boundary is 1.33 acres (0.59 + 0.51 + 0.23 acres for each of the three channels). Approximately 1.7 acres of meadow bunchgrasses (non-wetland) are located in the drainage immediately upstream of spring SP-72.

Wetland areas were identified by Brown and Caldwell (2000) for three spring sites: SP-2, SP-72, and SP-73 (**Figure 3-7**). Springs SP-1 and SP-3 were not included in this study area. A total of 0.34 acre of wetlands were delineated in the drainage that contains springs SP-72 and SP-73. Spring SP-2 has an associated wetland area of 0.48 acre. Therefore, total wetland area delineated for the study area is 0.82 acre. Vegetation in these wetland areas consist of hydrophytic communities on hydric soil. Dominant plant species for the wetland areas are listed in the Brown and Caldwell (2000) report (e.g., *Poa nevadensis; Elymus triticoides; Hordeum brachyantherum; Veronica anagalis-aquatica).* During summer months, when the water supply to hydrophytic plants is diminished or minimized, weedy and non-weedy annual upland vegetation tends to encroach upon the wetland communities (Brown and Caldwell 2000). Some spring sites have been disturbed by grazing and development activities. Springs SP-2 and SP-73 have associated piping and constructed stock ponds. Emergent hydrophytes and aquatic plants have established in the pond areas.

INVASIVE, NONNATIVE SPECIES

Weed species have been documented in noxious weed inventories near the Project area. Three species of noxious weeds present in the area are Scotch thistle, Canada thistle, and saltcedar (tamarisk) (RCI 1998).

Scotch thistle can grow to eight feet tall and is armed with spines that prevent livestock use in areas of heavy infestation. Seeds remain viable in soil for more than 7 years. Canada thistle reproduces asexually, and is difficult to control. Saltcedar is associated with mesic (dry) sites, and can propagate from buried or submerged stems. Salt can accumulate in this plant, eventually resulting in saline soil and elimination of less salt tolerant vegetation.

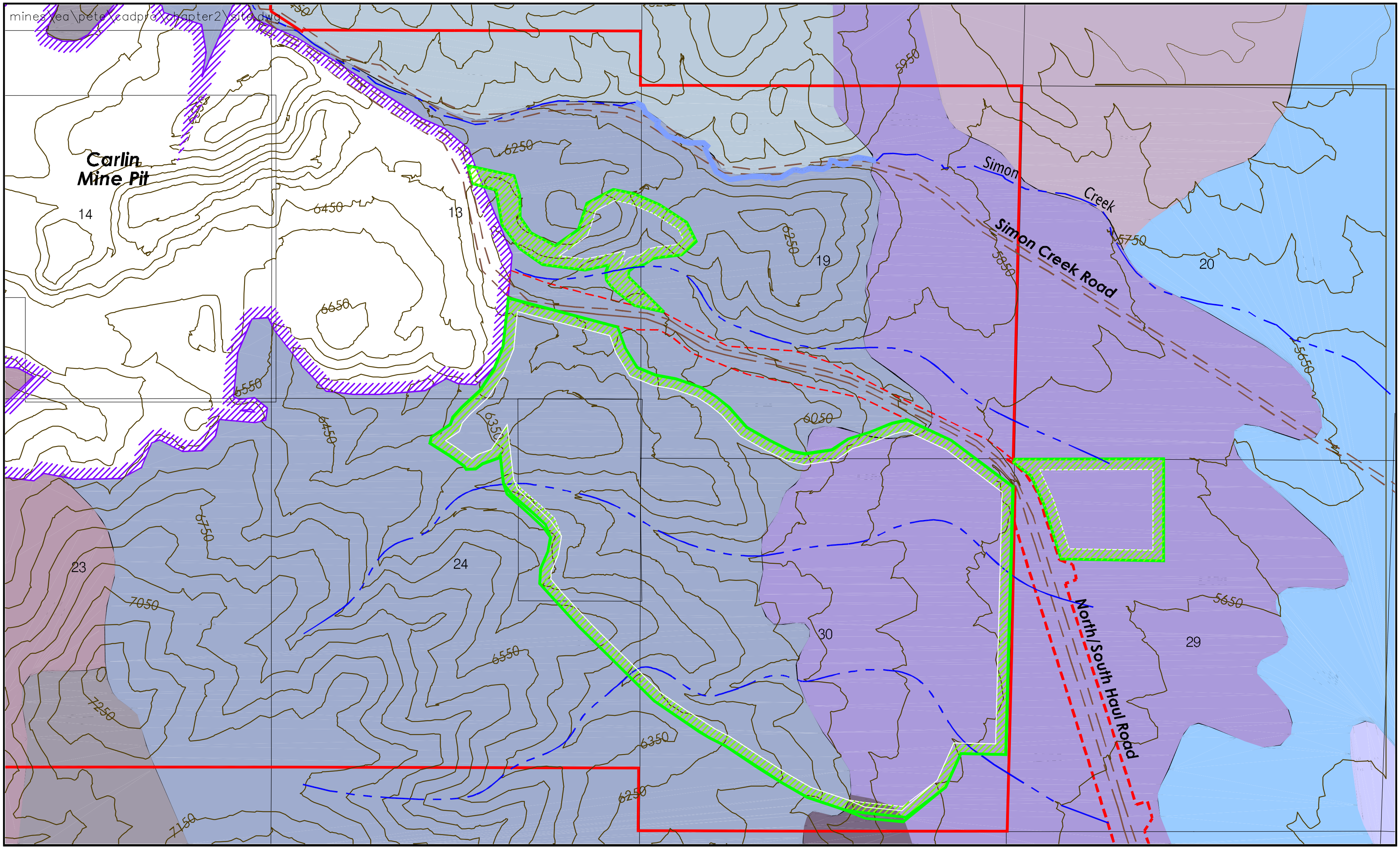
Other invasive nonnative species that occur in the vicinity include hoary cress, leafy spurge, diffuse knapweed, and Russian knapweed. Exotic annual grass, species, particularly cheatgrass and medusahead wildrye, often dominate native vegetation in many parts of the Great Basin, particularly in areas disturbed by fire (BLM 1999). Saltcedar is present along Sheep Creek in Section 10, T35N, R50E, and along Boulder Creek, in the Boulder Valley at several injection and monitoring well locations, and along the Humboldt River near Dunphy. Scotch thistle currently exists on previously disturbed and reclaimed exploration sites in the Leeville Project area, along Sheep Creek, Lynn Creek, and the TS Ranch Reservoir. Hoary cress exists along several roads throughout the Boulder Valley (BLM 1993).

Distribution of weeds on BLM land is currently being inventoried. The Natural Resource and Conservation Service is also compiling existing BLM, USFS, and state data to delineate extent of noxious weed populations in Nevada.

TERRESTRIAL WILDLIFE

Wildlife species in the Project area are typically associated with sagebrush and grassland habitats on relatively steep terrain. Game species include mule deer, pronghorn antelope, sage grouse, chukar, Hungarian partridge, and mourning dove. Small flocks of chukar, an introduced species, use habitat on steep, rocky slopes. Seasonally available water in the project area limits its value for sage grouse, chukar, and Hungarian partridge, all of which require daily access to water.

Mule deer migrate through the Pete Project area from mid-October through April. The Project is located in a traditional transitional (intermediate) range area used by mule deer migrating between high-elevation summer range (Tuscarora Mountains and Independence Mountains) to the north and lower elevation winter range areas to the south and southwest (southern end of Tuscarora Mountains and Dunphy Hills). Depending on annual weather conditions and deer population levels, several hundred to several thousand mule deer could migrate to and from these winter range areas south and southwest of the Carlin Trend and pass directly through the proposed Project area. Concentrations of mule deer gather north of the Project area during the late fall-early winter period and migrate in response to weather or natural migration impulse. Migration north from the winter range to summer range areas is more temporally and spatially dispersed during spring. NDOW has identified this route as the last remaining undisturbed deer migration corridor in the South Tuscarora Mountains and is important to the Independence and Tuscarora mule deer



N

0 Feet 2000

Contour Interval=20'

SOIL TYPES

- Chen-Pie Creek-Ramires Association
- Cherry Spring-Cortez Tomera Association
- Cluro Silt Loam
- Coff-Denay Association
- Donna-Simon Association
- Donna-Stampede Association
- Ramires-Chen-Bobs Association
- Slaven-Torro Association
- Taylor Creek-Chen Association

FEATURES LEGEND

- Soil Map Unit Boundary
- Existing Carlin Mine Disturbance
- Pete Project Disturbance Area
- Drainage - Perennial Flow
- Drainage - Ephemeral Flow
- Existing Access Road
- Carlin Plan of Operations Bndry. N-70574
- No./So. Haul Road Corridor POO-N16-81-009P

Soil Map
Pete Project EA
Carlin, Nevada
FIGURE 3-8

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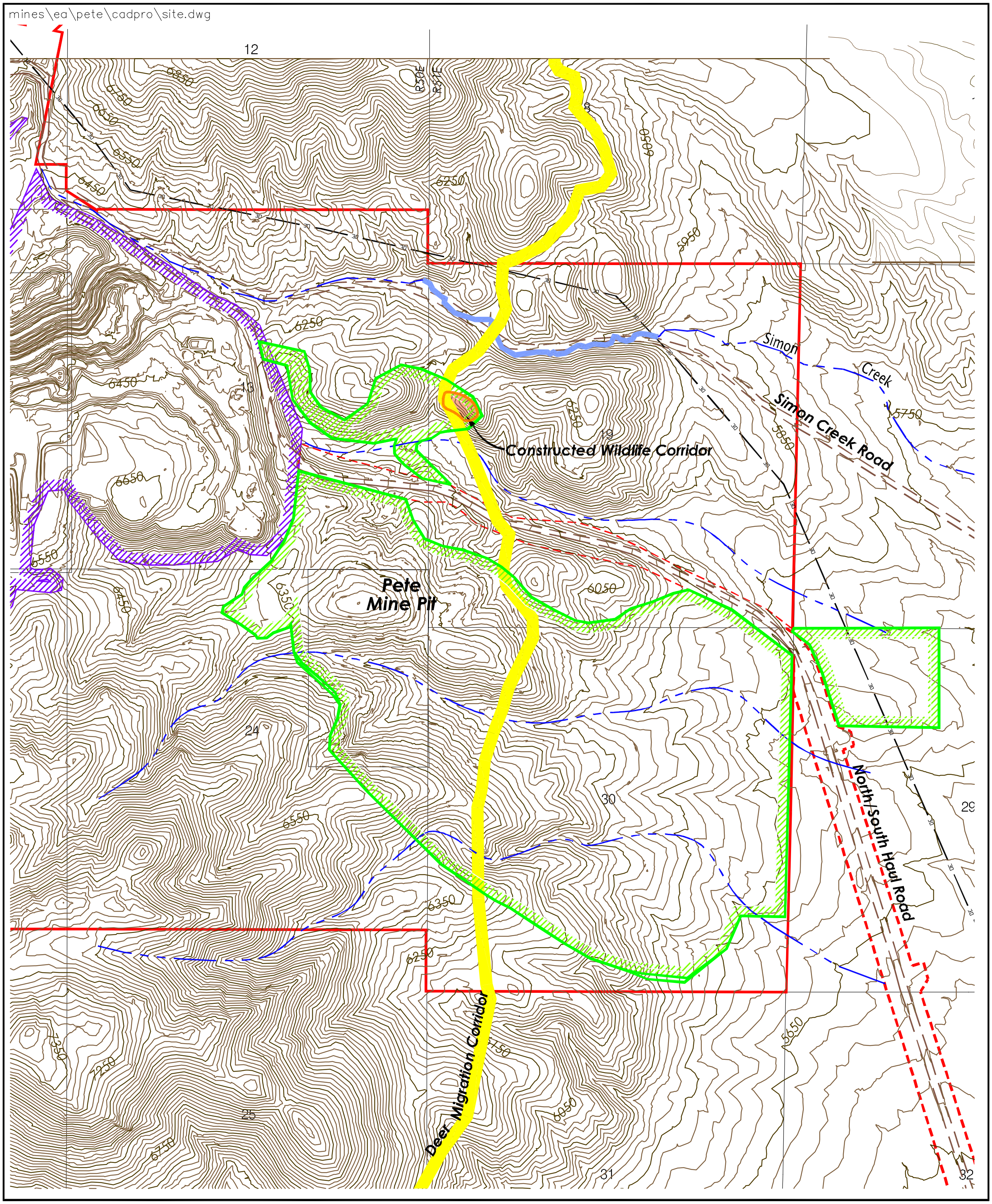

LEGEND

- Deer Migration Route
- Existing Carlin Mine Disturbance
- Pete Project Disturbance Area
- Index Contour
- Intermediate Contour
- Drainage - Perennial Flow
- Drainage - Ephemeral Flow
- Carlin POO N-70574
- North/South Haul Road POO N16-81-009P
- Overhead Electric
- Existing Access Road

N

0 Feet 2000

Existing Mule Deer Migration Corridor
Pete Project EA
Carlin, Nevada
FIGURE 3-9

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populations (Lamp 2002). Seasonal timing, duration, and routes of mule deer have been addressed in Environmental Impact Statements for Newmont's South Operations Area Project (BLM 1993), Bootstrap Project (BLM 1996) and in Dee Gold Cumulative Effects Analysis for Mule Deer and Pronghorn Antelope (BLM 1992). **Figure 3-9** shows the existing mule deer migration route through the proposed Pete Project area. (Also see discussion in *Mule Deer Migration Route* section in Chapter 2).

Mining activities from Boulder Valley east to the Carlin Mine area have created barriers to the remaining South Tuscarora Mountains migration corridor. As a result, the corridor is restricted to a narrow band, approximately one-half mile wide, on the east side of the range in the Project area. This remaining corridor was historically 10 miles wide, including intermediate range areas and migration routes, prior to development of the Carlin Trend in the South Tuscarora Mountains (**Figure 3-9**) (Gray 2002).

Presently, the migration corridor is encumbered directly to the north of the Project area by exploration activities such as trenching, drilling, and roads; traffic on State Route 766 (paved "Simon Creek Road"); livestock control fences with "let-down" spans on corridor areas; and the North-South Haul Road, which was constructed with wildlife ramps. The "let down" fence and wildlife ramps, which are previous Newmont mitigation, appear to keep these encumbrances from becoming barriers. Current ground disturbance in the Pete Project area includes extensive mineral exploration roads used to provide access for drilling. Noise associated with traffic on State Route 766 and the North-South Haul Road occurs within and adjacent to the Project area, though the variable extent of traffic noise and current affect on wildlife is not quantified.

The east slope of the Tuscarora Mountains has been identified as pronghorn antelope summer range by NDOW. Pronghorn antelope have been observed on summer range in the vicinity of the proposed Project area north along the eastside of the Tuscarora Mountains, south to Interstate 80 by BLM and NDOW personnel.

The Project area provides habitat in upland areas interspersed with seeps/springs and ephemeral drainages associated, in part, with moist soil regimes. There are approximately 100 bird species, 70 mammal species and several reptile and amphibian species that occur in sagebrush habitats on the Elko District (see **Appendix B** for predominant species).

Common small mammals include black-tailed jackrabbits, ground squirrels, deer mice, kangaroo rats, gophers, and chipmunks. Coyotes are common in and around the Project area and kit foxes and bobcats may be present in the vicinity.

Abandoned mine structures and natural caves are sought by many bat species for roosting, raising young (June 1 through August 15), and hibernating during winter. Fourteen bat species may potentially use abandoned mines in western Nevada (Tuttle and Taylor 1994).

Although the diversity of amphibians and reptiles is limited by the cool, dry climate, 28 species have been identified in BLM's Elko District. Species likely present in the Project area include the western fence lizard, striped whipsnake, desert horned lizard, gopher snake, Great Basin spadefoot toad, and western yellow-bellied racer.

MIGRATORY BIRDS

In January 2001, President Clinton signed the Migratory Bird Executive Order directing executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act. A list of migratory birds affected by the President's Executive Order is contained in 43 CFR 10.13. References to "species of concern" pertain to those species listed in the periodic report *Migratory Nongame Birds of Management Concern in the United States,* priority migratory bird species as documented by established plans (such as Bird Conservation Regions in the North American Bird Conservation Initiative or Partners in Flight physiographic areas), and those species listed in 50 CFR 17.11.

As defined in the Executive Order, "action" means a program, activity, project, official policy (such as a rule or regulation), or formal plan directly carried out by a Federal agency. The Executive Order further states actions by Federal agencies that have, or are likely to have, a measurable negative effect on migratory bird populations shall develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the U.S. Fish and

Wildlife Service to promote conservation of migratory bird populations. The term “action” will be further defined in the MOU as it pertains to each Federal agency’s own authorities and programs.

Per BLM Elko Field Office “Bird List” approximately 246 species of birds could inhabit the Elko District on a seasonal or yearlong basis. The Pete Project area provides upland habitat for migratory bird species. BLM lists 75 species of waterfowl and shorebirds found in the Elko District. Due to limited amount of water, the number of species potentially occurring in the Project area would be much less. Waterfowl and shorebird use in the study area is restricted to limited available surface water.

The proposed Pete Project is located within or adjacent to montane shrub and sagebrush habitat types. Bird species associated with these habitat types are shown in **Table 3-10.**

No raptors are known to nest in the Project area, although golden eagle, red-tailed hawk, ferruginous hawk, Swainson's hawk, prairie falcon, American kestrel, and great-horned owl occasionally may forage in the area. Songbirds such as western kingbird, Say's phoebe, horned lark, meadowlark, sage sparrow, and sage thrasher could nest in the Project area.

THREATENED, ENDANGERED, CANDIDATE AND SENSITIVE SPECIES

Threatened, endangered, and candidate species are those species for which state or federal agencies afford additional protection by law, regulation, or policy. Included are federally listed species protected by the Endangered Species Act (ESA); species proposed for federal listing, and federal candidate species, as identified by the U.S. Fish and Wildlife Service (USFWS); and species designated as state- sensitive by BLM (**Appendix C**). The BLM has also incorporated part of the Nevada State Protected Animal List into its sensitive species list. These species are afforded the same level of protection as candidate species if present on public land administered by BLM (BLM 2000b).

THREATENED AND ENDANGERED SPECIES

Bald eagle (threatened, proposed for delisting), and Lahontan cutthroat trout (LCT) (threatened) occur in or near the study area. LCT do not occupy habitat in the immediate Project area, but are present in the Maggie Creek drainage and the Rock Creek drainage northwest of the Project area.

TABLE 3-10
Bird Species Potentially Occurring in the Project Area

Montane Shrub	Sagebrush	Montane Riparian
Obligates: None	Obligates: Sage Grouse	Obligates: Wilson’s Warbler MacGillivray’s Warbler
Other: Black Rosy Finch Black-throated Gray Warbler Calliope Hummingbird Cooper’s Hawk Loggerhead Shrike Blue Grosbeak Vesper Sparrow MacGillivray’s Warbler Orange-crowned Warbler Swainson’s Hawk Western Bluebird	Other: Black Rosy Finch Ferruginous Hawk Gray Flycatcher Loggerhead Shrike Vesper Sparrow Prairie Falcon Sage Sparrow Sage Thrasher Swainson’s Hawk Burrowing Owl Calliope Hummingbird	Other: Cooper’s Hawk Northern Goshawk Calliope Hummingbird Lewis’ Woodpecker Red-naped Sapsucker Orange-crowned Warbler Virginia’s Warbler Yellow-breasted Chat
	Other Associated Species: Brewer’s Sparrow Western Meadowlark Black-throated Sparrow Lark Sparrow Green-tailed Towhee Brewer’s Blackbird Horned Lark	

Source: Nevada Partners in Flight Bird Conservation Plan 1999.

CANDIDATE AND SENSITIVE SPECIES

Habitat exists within or near the Project area for the following plant and animal species considered by BLM as special status: Preble's shrew, spotted bat, pale Townsend's big-eared bat, Pacific Townsend's big-eared bat, long-legged myotis, western long-eared myotis, western small-footed myotis, fringed myotis, golden eagle, northern goshawk, Swainson's hawk, ferruginous hawk, burrowing owl, sage grouse, Lewis buckwheat, Columbia spotted frog, Nevada viceroy, California floater, and spring snails.

No known sage grouse leks are located within the proposed Pete Project area boundary. The Richmond Mountain lek located approximately one mile south of the Project area was active during spring. The South Jack Creek Bench lek located less than 3 miles from the Project area was active on March 29, 2001. The two Fish Creek Bench leks located about 7 miles east were active in 2001; the upper lek was active in 2002. This information is based on single-day aerial or ground surveys conducted by BLM and NDOW. These leks were identified during wildlife surveys in the Newmont Inventory Area conducted by JBR Consultant Group during spring 1992 in support of the South Operations Area Project EIS. The proposed Project area and adjacent area provide suitable habitat for sage grouse yearlong use including all habitat necessary during lek attendance, nesting, summer, early and late brood-rearing, and fall/winter seasonal use periods.

Myotis and other bat species have been observed within several miles of the Project area. These species favor rock cliffs, crevices, abandoned mines, and caves as hibernacula. However, none have been documented in the Project area. Golden eagles and hawk species may conceivably forage within the Project area but breeding and nesting habitat is not present. Sage grouse likely occur in small numbers in the Project area. Several leks have been observed in the vicinity, however, none within the Project area. Osprey are primarily a spring and fall migrant in Nevada. Breeding of ospreys is unlikely in the vicinity of the Carlin Trend, though occasional migrants may roost or forage within the cumulative effects area. Suitable habitat for Preble's shrew, burrowing owl, and Lewis' buckwheat occurs in the Project area, but none of these species have been documented in the immediate vicinity.

The California floater (freshwater mussel), springsnails (mollusks), and Columbia spotted frogs are associated with wetlands and riparian habitats. These species have been documented in and around permanent water in several drainages in the Carlin Trend. The Nevada viceroy is associated with willow stands in riparian habitat found in valley floors below 6,000 feet amsl. They may, but are unlikely to occur in willow habitat at lower elevations near the Project area (BLM 2000b).

GRAZING MANAGEMENT

The Project study area lies within the T Lazy S Allotment. The T Lazy S Allotment is permitted to the Elko Land and Livestock Company, a subsidiary of Newmont and is operated as a commercial cow/calf operation. Depending on climate, forage conditions, and status of several ongoing habitat improvement projects, the BLM grazing permit has evolved in recent years to allow approximately 2,300 to 2,800 head. The grazing is managed in two herds during the interval of mid-February through November (Nyrehn 2002).

Adjustments to the animal unit month (AUM) carrying capacity have occurred to the T Lazy S permit to account for withdrawn land associated with mining operations (BLM 1995). An animal unit month (AUM) is the amount of forage required to sustain one cow and calf for one month. Based on past carrying capacity adjustments, the current permitted use on the allotment is 11,999 animal unit months (BLM 1998). Total permitted grazing use for the allotment, including active use and suspended non-use (due to mining activity and short-term fire rehabilitation closures) is 14,209 AUMs.

The Maggie Creek Watershed Restoration and the Bob Flat Emergency Fire Rehabilitation and Mule Deer Mitigation Reseeding projects are currently underway in the T Lazy S permit area. These projects are designed to improve riparian habitat conditions, rehabilitate areas affected by wildfire, and enhance mule deer habitat (Nyrehn 1998).

NOISE

Sound attenuates (fades) as it travels from a source to a receiver. Attenuation is a function of the square of the distance, but is also dependent upon other factors, such as altitude of the source, temperature, humidity, wind speed, terrain, and vegetation (Bowles 1995). The noise heard by a human or an animal is dependent on these variables, and upon other factors, such as ambient noise, and the auditory system and physiology of the animal.

Because of the remote location of the Pete Project, no measurements or estimates of baseline sound were made at the proposed mine site. The nearest residential noise receptor area is Carlin, approximately 15 miles southeast. Carlin is located along Interstate 80 and is affected by traffic noise from the highway as well as normal urban sounds.

Principal sources of noise in the Project area are from existing mining operations at the Carlin Mine. Noise generated by trucks, dozers, and other mining equipment generally ranges from 85 to 90 dBA (A-weighted decibel sound scale) at the source. Sound levels from blasting range from 115 to 125 dBA, at 900 feet.

VISUAL RESOURCES

The study area for visual resources includes all land areas from which the Proposed Action and Alternatives would be visible. This includes the Maggie Creek Basin and the eastern slopes of the Tuscarora Mountains. The landscape of the study area is characterized by broad, open vistas framed by scattered hills and mountain ranges. The Project site is hilly terrain on the eastern slope of the Tuscarora Mountains, which rise abruptly to over 7,500 feet amsl. Views of the Tuscarora Mountains exhibit similar slopes and rounded forms prevalent in the lower hills.

Vegetation in the Project area consists primarily of homogenous patterns of sagebrush-grassland. Natural vegetation patterns are disturbed by active mining and exploration operations and reclaimed exploration and mining sites. Dominant vegetation experiences seasonal color variations of gray, gray-green, and olive green to yellow and brown in summer. Colors vary from sand, buff, and taupe at higher elevations to slate, ash, and sage in lowland areas. **Figure 3-10** shows the location of the key observation point (KOP) selected for analyzing visual changes for the Pete Project. **Figure 3-11** represents existing conditions in the Pete Project area as viewed from KOP-1.

Soil and rock are exposed in numerous areas where vegetative cover is sparse or has been disturbed by mining activities. Soil color ranges from chalky off-white to beige. Disturbed soil exhibits a wider range of color including black, dark gray, reddish brown, buff, and chalky white. Color hues of disturbed soil are stronger than those of undisturbed areas, and exhibit much greater variation. These colors contrast strongly with surrounding soil and vegetation. A wide range of rock and soil colors include light gray, brown, buff, maroon, and black.

Existing mine disturbances in the vicinity of the Pete Project create moderate to strong contrasts with horizontal lines, smooth surfaced blocky and pyramidal forms, and more vivid colors from disturbed soil and rock. The dominant visual element in the Project area is extensive mining activity, which has transformed the original hilly topography into flat-topped, steep-sided benches, benched pit highwalls, linear features such as haul roads and access roads.

BLM utilizes a Visual Resource Management (VRM) system to classify and manage visual resources based on scenic quality, visual sensitivity, and visual distance zones. The majority of the Project lies within VRM Class III. The objective of this class is to partially retain existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes caused by management activities may be evident and begin to attract attention, but these changes should remain subordinate to the existing landscape. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

The refractory ore stockpile would be located within a VRM Class IV area. The Class IV VRM objective is to allow for management activities that involve major modification of the existing character of the landscape. The level of contrast can be high – dominating the landscape and the focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of the characteristic landscape.

CULTURAL RESOURCES

All components of the proposed Pete Project have been examined as a result of past cultural resource investigations. The following cultural inventories occurred within or immediately adjacent to the proposed Project area:

- Pete Project (1-1689[p] and 1-1935[p]);
- Carlin Plan of Operation (1-2026[p]);
- Mill Ore Haul Road (1-1725[p]);
- Utility Construction (1-1126[p]); and,
- Fence Corridors (1-1867[p], 1-1905[p], and 1-1926[n]).

The inventories were conducted to determine if cultural resources exist and, if so, whether they are eligible for inclusion on the National Register of Historic Places. These studies resulted in discovery of 12 prehistoric period sites, 2 prehistoric period isolates, 2 historic period sites, and one historic period isolate completely or partially located within the proposed Pete Project area. Eleven prehistoric period sites and both historic period sites have been determined ineligible for inclusion in the National Register of Historic Places. Based on consultation between BLM and the Nevada State Historic Preservation Office, one prehistoric site recorded along the north edge of the Project area (CrNV-12-11725) was determined eligible to the National Register under criterion D of 36 CFR 60.4. This site was subject to data recovery excavation to mitigate impacts associated with construction of the North-South Haul Road in 1994 (Jones et al. 1994). Archaeological site CRNV-11-10039 which is located approximately 150 feet east of the proposed disturbance in the SE ¼ of section 30 (outside of the Carlin Plan of Operations boundary) was previously determined eligible for the National Register of Historic Places (report BLM1-1935(P).

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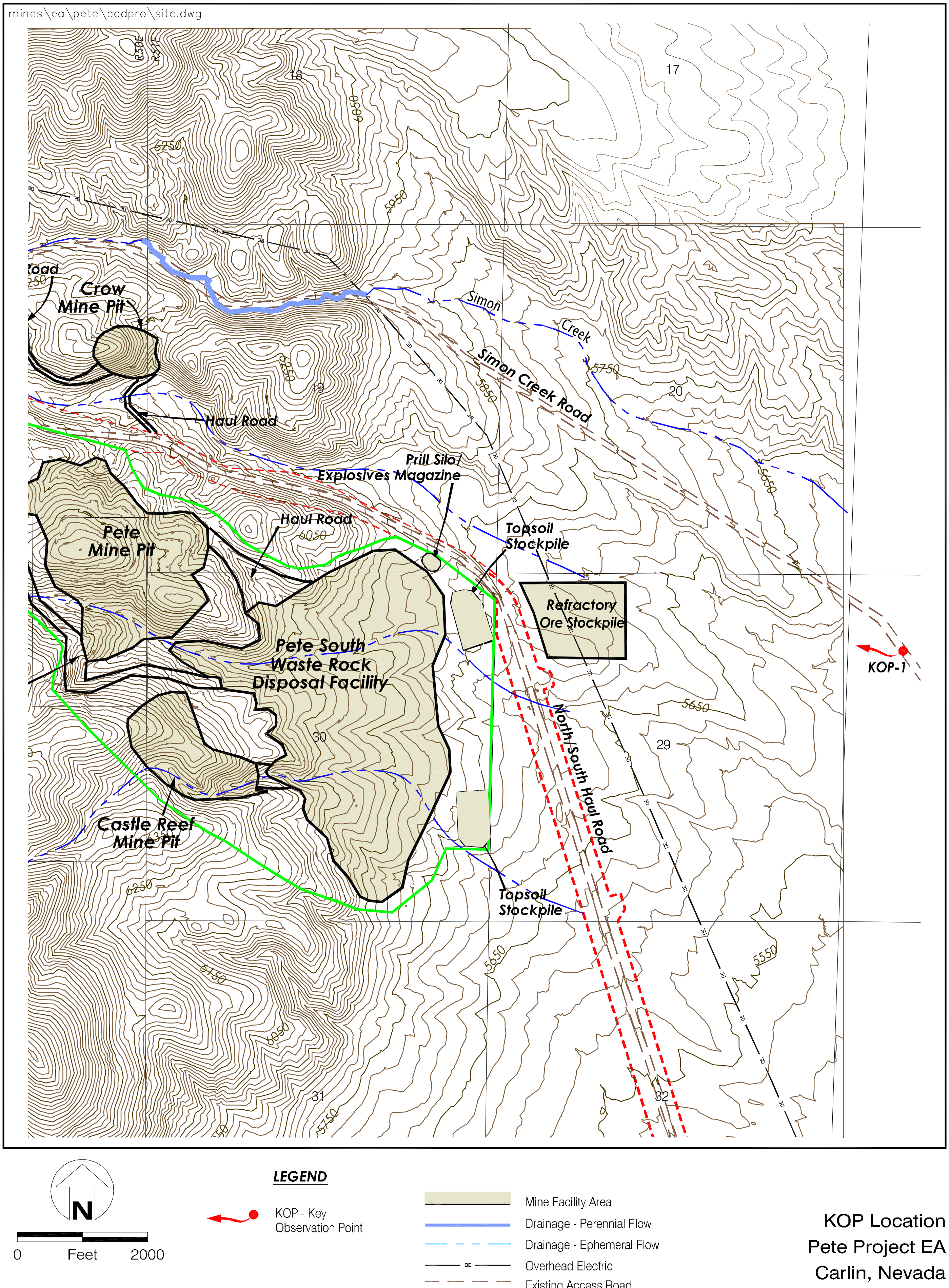

KOP Location
Pete Project EA
Carlin, Nevada
FIGURE 3-10

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Existing Conditions From KOP-1
Pete Project EA
Carlin, Nevada
FIGURE 3-11

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CHAPTER 4

CONSEQUENCES OF THE PROPOSED ACTION

Potential direct, indirect, and cumulative impacts of the Proposed Action and Alternatives are described in this chapter. Construction, operation, and reclamation of the Pete Project and alternatives identified in Chapter 2 would result in direct, indirect, residual, and cumulative impacts to the environment.

BLM has analyzed potential impacts that could result from the Proposed Action. No components of the Proposed Action were determined to have potentially significant impacts requiring an alternative to eliminate or reduce impacts. Therefore, the only alternative to the Proposed Action discussed in detail in this EA is the No Action Alternative. Minor issues and impacts identified in this chapter are addressed with specific mitigation measures if applicable.

Potential mitigation measures address the Proposed Action and have been identified in each resource description contained in this chapter for which a potential impact is described. Mitigation measures proposed by Newmont are summarized in Chapter 2. Additional mitigation and monitoring measures can be required by BLM as a condition or stipulation of approval for authorization of the Plan of Operations.

DIRECT AND INDIRECT IMPACTS OF PROPOSED ACTION

GEOLOGY AND MINERALS

Under the Proposed Action, waste rock would be placed in the Pete South Waste Rock Disposal Facility (**Figure 2-2**). Ore would be transported directly to existing processing facilities in the North and South Operations Areas.

Potential direct and indirect impacts of the Proposed Action include exposure of potentially acid-generating rock to oxygen and precipitation and relocation of rock from its existing location to the waste rock disposal site. Geologic and mineral resources within the area affected by the proposed Pete Project would be directly impacted by relocation of approximately 83.3 million tons of waste rock and 3.8 million tons of ore.

The Proposed Action would create indirect impacts by placing rock with potential to release trace elements, in the waste rock disposal site. Rain and snowmelt infiltrating through waste rock piles could potentially result in a water discharge containing elevated concentrations of some metals.

Tonnage of waste rock to be extracted under the Proposed Action has been estimated by rock type for the life of the Project for each phase of mine development, pit, and year (Newmont 2002a). Total waste rock tonnage and tonnage-weighted acid rock drainage (ARD) characterization parameters are listed by operational waste rock type in **Table 3-2**. Potentially Acid-generating (PAG) rock has a neutralization potential ratio (NPR) of less than the BLM Standard 3:1 and NDEP Standard 1.2:1 (BLM 1996). The predicted overall net carbonate value (NCV) for run-of-mine waste rock is 10 percent CO_3 (equivalent to an ANP value of 227 tons/1,000 tons (kton) $CaCO_3$). Net acid neutralizing potential (ANP) to acid generating potential (AGP) ratio is 23.1; above pertinent regulatory requirements. The ANP/AGP ratio for each year is also above regulatory thresholds. Waste rock produced from the proposed Pete and Castle Reef pits would be moderately to strongly net-neutralizing, but much of the waste rock produced from the smaller Crow pit would be refractory sulfide waste rock. Rock to be mined from Crow pit is weakly acidic, based on available static test data, but ANP/AGP ratios for this rock are below the regulatory ANP/AGP criteria of 1.2:1 (NDEP) and 3:1 (BLM) and therefore indicate an uncertain potential to generate acid. These results show that although approximately 18 percent of the run of mine waste rock generated throughout mine life would be PAG, waste rock to be produced by the Pete Project would not be acid generating on a run-of-mine basis. Potential release of trace elements by localized "hot spots", have potential to be mobile under neutral to alkaline pH conditions.

Data in **Table 4-1** summarizes the neutralization potential ratio (ANP/AGP) by pit and year. These results collectively indicate the total mass of waste rock would be non-PAG with a net neutralization ratio between 8.6 and 61.6 annually. Over the life of mine, the run of mine waste rock would have a net neutralization ratio of 21.9. During years 3 and 4, the Pete and Crow pits would produce some potentially acid generating material.

Table 4-2 summarizes average metal mobility values, calculated for the MWMP results based on the relative percentage of operational waste rock units. These results indicate that seepage from waste rock would exceed primary domestic or municipal water quality standards for cadmium (Cd), nickel (Ni), selenium (Se), and sulfate (SO4). Secondary standards would be exceeded for aluminum (Al), manganese (Mn), and total dissolved solids (TDS).

TABLE 4-1
Net ANP/AGP Ratio of Waste Rock Produced
Pete Project

	ANP/AGP Ratio						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
Pete Pit							
Phase 1	61.63	21.49	57.18	48.04			
Phase 2			35.852	61.32	34.30	13.17	
Phase 3			13.38	7.82	8.71	5.72	7.84
Crow Pit							
			0.85	0.89			
Castle Reef Pit							
						40.82	40.82
Annual Average	**61.6**	**21.5**	**19.3**	**31.9**	**22.5**	**8.6**	**21.9**

Weighted average for each year is based on relative tonnage from each phase in each year.
ANP = Acid-Neutralizing Potential; AGP = Acid-Generating Potential.
Source: Newmont 2002a.

TABLE 4-2
Average Metal Mobility Values for Waste Rock
Pete Project

Parameter	**Nevada Water Standards (mg/L)**	**MWMP Results From Weighted Average ROM Waste Rock (mg/L)**
Aluminum (Al)	0.2(s)	0.41
Antimony (Sb)	0.146	0.038
Arsenic (As)	0.05	0.02
Barium (Ba)	2.0	0.105
Cadmium (Cd)	0.010	0.58
Chromium (Cr)	0.05	0.006
Copper (Cu)	1.3*	0.011
Iron (Fe)	0.6* (s)	0.23
Lead (Pb)	0.015*	0.005
Manganese (Mn)	0.1* (s)	0.55
Mercury (Hg)	0.002	0.0002
Nickel (Ni)	0.0134	1.63
Selenium (Se)	0.05	0.22
Silver (Ag)	0.1	0.005
Thallium (Tl)	0.013	0.006
Zinc (Zn)	5.0* (s)	3.9
Alkalinity		71
Sulfate (SO_4)	250(s)-500*	621
Total Dissolved Solids	500(s)-1000*	1026
pH	6.5-8.5(s)*	7.23

Notes:
Nevada water quality standards are the "Municipal or Domestic Supply" values listed in LCB File R128-95, Nov. 7, 1995. if no corresponding state standard exists, the federal drinking water standard is used and denoted by an asterisk (*). Values with (s) are secondary drinking water standard.
MWMP = meteoric water mobility procedure; ROM = run-of-mine; mg/L = milligrams per liter
Source: Newmont 2002a.

Placement of waste rock on an engineered and constructed low permeability pad would mitigate potential effects of any localized acid rock drainage and trace element release. The compacted pad layer would limit infiltration of leachate into the foundation of the waste rock disposal facility. Leachate forming in the disposal facility would flow along the compacted surface to the seepage collection pond. Diversion ditches would be constructed along the upper edge and sides of the waste rock disposal facility to collect run-off and prevent run-on to the pad.

Newmont plans to further characterize and sample waste rock during operations (see Chapter 2 - *Waste Rock Disposal Facility*), to verify baseline model results and identify changes in geochemical conditions during production that might affect waste rock management. At the time of closure, the waste rock disposal facility would be covered to minimize infiltration. Appropriate surface water management practices would be implemented to reduce run-on and infiltration.

Methods of post-mining waste rock facility reclamation have been proposed by Newmont (1997). These methods include regrading and revegetating the waste rock facility and diverting run-on surface water. These actions would stabilize disposal facility and simultaneously limit infiltration and erosion. Quarterly inspection of waste rock disposal facilities would be conducted for signs of mine drainage production and to ensure integrity of the cover and surface water management systems.

Any disruption to mine facilities and workings from seismic activity would be from liquefaction or ground rupture. Liquefaction occurs when seismic shaking causes earth material to lose its inherent strength and behave like a liquid. In general, liquefaction can occur where earth material is fully saturated, loose, unconsolidated, and/or sandy. Surface or underground rupture may occur along an active fault trace during an earthquake.

AIR QUALITY

Under the Proposed Action, ore and waste rock would be removed from three open pit mines, with a total disturbance of 863 acres on public and private land. Gaseous and particulate air contaminant emissions would be generated during construction and mining activities. Mining practices including drilling, blasting, waste rock removal and disposal, and ore removal and storage would generate fugitive particulate emissions. In addition, fugitive road dust emissions would be generated from vehicle traffic on unpaved haul roads. Both oxide and refractory ore would be processed off-site at nearby Newmont facilities in both the North and South Operations Area.

Diesel engine exhaust from mining equipment and various transportation vehicles would generate gaseous air pollutants. Refueling of vehicles at the fueling area would result in a minimal release of gaseous air pollutants.

Particulate Emissions

Mining activities in the three open pits would result in fugitive particulate emissions. Ore and waste rock would be drilled and blasted, then loaded into haul trucks for removal to stockpile storage or off-site processing. Fugitive particulate emissions would result from the drilling, blasting, loading and unloading of the ore and waste rock. In addition to the mining and blasting activities, other sources of particulate emissions include wind erosion of unvegetated areas and stockpiles and vehicle traffic on unpaved roads.

Gaseous Emissions

The proposed Pete operations would be a source of gaseous pollutants including sulfur dioxide (SO_2), carbon monoxide (CO), oxides of nitrogen (NOx), and volatile organic compounds (VOCs). Sources include vehicle exhaust emissions from mining equipment and vehicles and the equipment refueling area.

Another source of gaseous pollutants would be ammonium nitrate and fuel oil (ANFO) used in blasting activities. The use of ANFO can cause fugitive emissions of SO_2, CO, and NOx.

Mercury Emissions

As described in the Proposed Action in Chapter 2, Newmont would transport all ore from the Pete operations off-site for processing at Newmont facilities in the South or North Operations Areas. Oxide ore would be processed at the existing North Operations Area Leach facility. Refractory ore would be processed at the existing Mill 5/6, located in Newmont's South Operations Area. Refractory ore processing operations at the South Operations can create mercury emissions. Diesel and gas combustion sources also emit trace amounts of mercury.

Based on Newmont's Toxic Release Inventory (TRI) reporting to the USEPA database, total air-borne emissions of mercury at the South Operations Area was 359 pounds in 1999. Oxide ore processing activities at the North Operations Area do not result in a mercury emission and there is no TRI reporting. Maximum potential hourly mercury emissions are not expected to increase due to processing of Pete ore at the South Operations Area. Total annual mercury emissions from the ore processing facilities are approximately proportional to the amount of ore processed.

Mercury is included on the federal list of Hazardous Air Pollutants, which has been adopted by reference in the Nevada air quality regulations. Nevada air quality regulations (NAC445B339) prohibit the *"discharge into the atmosphere from any stationary source, any hazardous air pollutant or toxic regulated air pollutant that threatens the health and safety of the general public, as determined by the director."*

USEPA has not established a National Emission Standard for Hazardous Air Pollutants (NESHAPs) for mercury emissions from gold ore processing facilities. Mercury is not considered a primary pollutant and no federal or state ambient air quality standard (NAAQS) has been established for mercury under the Clean Air Act.

In November 2000, the Nevada Division of Environmental Protection (NDEP) published a report entitled "Mercury Emissions from Major Mining Operations in Nevada." The NDEP report concludes that, based upon review of available information, "there is currently no imminent and substantial public health threat associated with mercury emissions in the region. NDEP will continue its current mercury monitoring efforts and will track monitoring efforts of other agencies." The report also states that there is "insufficient data to determine whether the mercury measured in the environment of the region results from natural or anthropogenic sources."

WATER QUANTITY AND QUALITY

Surface Water

Minor impacts to the local surface water drainage system would result from the Proposed Action. The proposed mine pits and waste rock disposal facility would be located on east-west trending ridges and coulees on the east side of the Tuscarora Mountains. In general, three ephemeral drainages extend from west to east through the Pete Project area (**Figure 3-7**). These drainages have flow only when major precipitation events or snow melt produces sufficient water to accumulate in the relatively small channels.

The middle ephemeral drainage in the Pete Project area extends through the southern part of the proposed Pete pit and the northern part of the proposed Pete South Waste Rock Disposal Facility. The southern drainage is located along the south side of the proposed Castle Reef pit and the southern part of the waste rock disposal facility. The northern ephemeral drainage is immediately south of the proposed Crow pit and would contain the North-South Haul Road. The only nearby drainage with perennial stream flow – Simon Creek – is located north of the proposed mine disturbance area and, therefore, would not be directly or indirectly affected by the Proposed Action (**Figure 3-7**).

During operations, surface water that could flow into the mine pits or waste rock disposal facility would be intercepted by diversion ditches constructed around the up-gradient perimeter of these features. The smaller Crow and Castle Reef pits are located on ridges (i.e., drainage divides) and, therefore, are not expected to collect any surface runoff. Any runoff that may flow from the surface of the waste rock disposal facility would be routed to a collection pond(s) using diversion ditches. Each pond would be designed to contain calculated run-off volume from a 100-year, 24-hour storm event. Any water that collected in the pond(s) would be used for road watering or trucked to the North Area Leach Facility.

During construction of proposed mine facilities, including ancillary haul roads, minor increases in sediment load to ephemeral drainages may occur. Best Management Practices (BMPs) (Nevada State Conservation Commission 1994) would be used to minimize any increases in erosion and sedimentation from newly disturbed areas. Other than sediment, no other impacts to surface water quality are expected from the Proposed Action.

After completion of mining and reclamation activities, the three open-pit mines could collect some surface water runoff on a seasonal basis. The two smaller pits (Crow and Castle Reef) are located on ridges and, therefore, have little or no drainage area above them. Only direct precipitation would fall into these two pits and that water would likely immediately infiltrate and/or evaporate, with little chance of ponding. An ephemeral drainage would extend through the larger Pete pit with a drainage area of about 500 acres above the pit. A permanent diversion structure, however, would be maintained above the Pete pit to prevent potential seasonal drainage in the ephemeral channel from entering the pit.

Springs and Seeps

Two seeps (SP-74 and SP-75) would be buried by the Pete South Waste Rock Disposal Facility (**Figure 3-7**). As described in the *Water Quantity and Quality* section of Chapter 3, these hydrologic features are seasonal seeps that are only wet in the Spring and become dry early in the Summer. These seeps then typically remain dry until the following Spring. As described in Chapter 2, French-drains would be constructed as needed under the engineered waste rock pad to allow for drainage of seep water. Three springs (SP-2, SP-3, and SP-56) are located ½-mile or less downgradient (east-southeast) from the proposed waste rock disposal facility (**Figure 3-7**).

The proposed mine pits would not directly impact flow from springs and seeps because these hydrologic features are not within the proposed mine direct disturbance areas. There may be an indirect impact on flow of some springs/seeps in the Pete Project area (**Figure 3-7**) if perched water intercepted by the Pete pit is connected to any of the springs/seeps. These likely would be SP-1, SP-2, SP-3, and/or SP-73 (**Figure 3-7** and **Table 3-8**) because these four springs have had measurable flow both in the Spring and Fall periods, and are located nearest to the proposed mine pits. Spring SP-1 is located upgradient and at a higher elevation than the perched water and, therefore, would not be affected by the mining. Springs SP-2 and SP-3 are located approximately 1 to 1 ½ miles downslope (southeast) from the proposed Pete pit. Spring SP-73 is located approximately 2,000 feet northeast of the Pete pit. All three of these springs (SP-2, SP-3, and SP-73) have measurable flow rates ranging from 0 to 6 gpm (**Table 3-8**).

Seep SP-72 is located immediately down-slope (southeast) from the proposed Crow pit in the bottom of an ephemeral drainage. This seep is wet only in the Spring if sufficient recharge to the drainage occurs seasonally in this area. Source of water in this seep is believed to be from alluvium in the drainage bottom. The Crow pit is not expected to intercept this alluvium and, therefore, would not affect the seep flow.

Adverse impacts to water quality for springs and seeps are not expected from the Proposed Action. The Pete South Waste Rock Disposal Facility would be constructed with a layer that would direct any seepage to a collection pond. Seepage reporting to the pond would evaporate or would be hauled via water trucks to the North Area Leach Facility for disposal.

Groundwater

As described in the *Water Quantity and Quality* section of Chapter 3, groundwater elevations in the Pete Project area currently are in the general range of about 5500 to 6000 feet amsl in the Upper Plate, and 4800 to 5200 feet amsl in the Lower Plate hydrostratigraphic unit. A few piezometers in the Lower Plate have higher water level elevations due to localized perched zones, likely created by structural control (i.e., faults). The pre-mine dewatering groundwater elevation for the regional carbonate aquifer (Lower Plate) is estimated at approximately 5270 feet amsl (see *Water Quantity and Quality* section, Chapter 3).

The Pete and Castle Reef pits would intercept Lower Plate carbonate rocks; whereas, the Crow Mine Pit would intercept primarily Upper Plate siltstone (**Figures 3-3, 3-4,** and **3-5**). The potentiometric surface in the Lower Plate hydrostratigraphic unit (4800 to 5200 feet amsl) is well below the projected final depth of the Pete pit (5530 feet amsl) and Castle Reef pit (5950 feet amsl). As described in the *Water Quantity and Quality* section of Chapter 3, two Lower Plate piezometers (Pete-3 and Pete-8) in the Pete pit area intercept perched water zones at elevations of about 5810 to 5850 feet amsl (**Figures 3-4** and **3-5**). Once dewatering ceases in the Carlin Trend, the Lower Plate potentiometric surface is projected to rise to about 5270 feet amsl, which is about 500 feet below the ultimate Pete and Castle Reef pit bottoms.

As described in the *Water Quantity and Quality* section of Chapter 3, perched groundwater intercepted in Pete-3 and Pete-8 in the proposed Pete pit area is of limited areal extent in Lower Plate rocks and isolated from regional perched flow systems to the north in the Tuscarora Mountains. The geology (Lower Plate rocks versus Upper Plate or mountain block rocks), faults (**Figure 3-3**), and water elevations (less than 6,000 feet at Pete site) all combine to prevent connection between perched water at the Pete site with other areas. In addition, Newmont (1998) reports that several air-lift tests were conducted from some of the wells that encountered perched water, with little or no water recovery in the wells during the observation period. Therefore, shallow perched water in the mountain block system north of the Pete Project area that is a source to streams that provide Lahontan cutthroat trout habitat (i.e., Little Jack, Coyote, and Beaver creeks) would not be affected by the Pete pit. These streams are located 6 to 13 miles north of the Pete Project site (**Figure 3-6**).

Piezometers adjacent to the proposed Crow pit (Pete-4, -5, -6, -12, and -15) show that water elevations in the Upper Plate (5500 to 5700 feet amsl) are below the projected final pit bottom elevation (5710 feet amsl) (**Figure 3-5**). Several other piezometers farther from the proposed Crow pit, but completed in the Upper Plate, have water levels that are higher than the projected Crow pit bottom (Pete-11 and Pete-14 = 5840 feet amsl; Pete-16 = 5985 feet amsl). These higher water levels may reflect perched water zones. As stated above for the Pete pit, these water levels are below the 6,000 foot elevation and are not likely connected to a regional shallow groundwater flow system. Alluvium in the ephemeral drainage immediately south of the proposed Crow pit has a water level elevation of 5744 feet amsl in piezometer Pete-10. This mine pit, however, is not expected to intercept the alluvial groundwater.

Any water that collects in the mine pits during the operational period would be used for road watering. This water volume, if any, is expected to be minor because it would be from limited zones of perched groundwater or from direct precipitation (see previous discussion of perched groundwater). After operations, any water that collects in the mine pits would be subject to evaporation and possibly infiltration. Due to the expected brief residence time of this water in the pit bottom, water quality should not be a problem.

As discussed in the *Springs and Seeps* section, the Pete South Waste Rock Disposal Facility would be constructed with a low permeability liner such that any seepage of precipitation through the waste rock would be directed to a collection pond. Any water that collects in the pond would be used for road watering or trucked to the North Area Leach Facility. The seepage collection pond system would remain in place until the agencies determine that it is no longer needed for solution collection. Newmont would remove the pond dike, regrade, and seed the pond site in accordance with the reclamation plan.

SOIL

Impacts to soil resources occur in two separate stages during mining: 1) soil loss during mining, when salvaged topsoil is stockpiled and stabilized in storage areas; and, 2) soil loss while stockpiled and during final topsoil redistribution and completion of reclamation. Although impacts to soil are greater during mining, erosion of topsoil during and after redistribution would have a greater effect on final reclamation.

Direct impacts on soil resources from the Proposed Action would include modification to soil chemical and physical characteristics, loss of soil to wind and water erosion, and decreased soil biological activity over a surface disturbance of 863 acres. Chemical changes would result from mixing surface soil with subsoil during salvage operations, including a reduction in the percentage of organic matter in surface soil.

Impacts to physical characteristics of soil during salvage, stockpiling, and redistribution would include soil mixing, compaction, and pulverization from equipment and traffic. Soil compaction and pulverization would lead to loss of structure, decreased permeability and available water-holding capacity, and loss of finer-grained soil material due to effects of erosion.

Soil loss from wind erosion is potentially high in Nevada's arid, windy climate. The potential for loss of salvaged soil would be greatest during reclamation after topsoil redistribution on disturbed areas. Potential for loss of subsoil would be greatest between initial disturbance and cover soil redistribution. The volume of soil would depend on wind velocity, size and condition of exposed area, and soil texture.

Water erosion potential could be high during heavy precipitation due to exposed soil, fine soil texture, soil surface conditions, and slope. Management practices as proposed by Newmont such as mulching, addition of organic matter, interim seeding, or leaving slopes in a roughened condition would reduce losses.

Redistributed soil would have a lower organic matter content as a result of salvage and stockpiling. Soil biological activity would be greatly reduced or eliminated during stockpiling as a result of anaerobic conditions created in deeper portions of stockpiles. After soil redistribution, biological activity would slowly increase and eventually reach pre-salvage levels.

Redistribution of soil during reclamation would result in soil losses and compaction from loading, hauling, and placement. Soil loss would continue after placement until vegetation is established.

Newmont's Reclamation Plan (2001a) describes Best Management Practices (BMPs) that would be used to reduce sediment loss from disturbed areas (e.g., silt fences, straw bales, water diversion, and settling basins) throughout the life of the Project and during post-reclamation activities. Mitigation measures that would be implemented by Newmont include salvaging suitable soil for reclamation and seeding soil stockpiles to establish vegetative cover. This would reduce potential soil loss from wind and water in the soil stockpiles. Reclamation activities designed to reestablish premining topographic contours would use topsoil and grass species that enhance the percentage of ground covered with vegetation (Lewicki 1997). Newmont would perform interim and, when possible, final reclamation concurrently with mining activities (Newmont 2001a). Such measures would reduce the duration of time that soil is exposed to erosional elements.

Indirect impacts on other resources caused by soil disturbance from the Proposed Action include:

- Changes in water quality due to sedimentation from erosion of exposed slopes;
- Decreased vegetative productivity due to soil loss or inadequate cover soil depth; and,
- Decreased land utility.

VEGETATION

The Proposed Action would disturb 863 acres of big sagebrush-grassland communities. These communities and their component species are not limited or rare in the Project area or region. Direct impacts include removal of vegetation, soil compaction, and disturbance.

Reclamation seed mixes would result in establishment of self-perpetuating plant communities on revegetated areas. Revegetation efforts would focus on species that provide food and cover for a variety of native animals. Techniques used to establish a forage base for mule deer include planting seedlings and over-seeding with an appropriate grass-forb-shrub seed mix. The seedlings and seed mix would be determined on a site-specific basis.

Following mining and initiation of reclamation, there would be a potential for noxious weed invasion or spread to disturbed sites (see *Invasive, Nonnative Species* section in this chapter).

WETLAND/RIPARIAN AREAS

None of the wetland areas delineated in the Pete Project area would be directly or indirectly impacted by the Proposed Action. These wetland areas are associated with springs SP-2, SP-72, and SP-73 (**Figure 3-7**). Portions of the two southern-most WUS channels would be covered by the proposed Waste Rock Disposal Facility and some road crossings. Total WUS acreage affected by the waste rock facility and roads would be approximately 0.25 acre. In addition, the Pete Mine pit would remove approximately 1,500 feet of WUS channel, or approximately 0.07 acre assuming an average channel width of 2 feet. The northern-most WUS channel in the project area would only be affected by approximately 0.01 acre of road fill. Diversion ditches would be constructed upgradient from the Waste Rock Disposal Facility and the Pete and Castle Reef mine pits to divert any run-on water around them. The WUS areas that would be impacted by the Proposed Action would be subject to permit approval by the COE.

INVASIVE, NONNATIVE SPECIES

Soil disturbance provides an opportunity for noxious weed establishment. The Proposed Action would create approximately 863 acres of new disturbance resulting from mine development, exploration activities, construction of a waste rock disposal facility; ore stockpile areas, and ancillary facilities.

Increased human activity could increase potential for wildfire, with subsequent spread of invasive annuals such as cheatgrass, and loss of native shrubs. Increased human presence would also increase the likelihood that wildfires could be quickly controlled. Increased vehicle activity could increase potential for entry and spread of noxious weed species because weed seeds are often lodged in vehicle under carriages and tires. Newmont conducts weed inventories and treats priority areas to eradicate and/or control noxious weeds throughout the Carlin Trend.

TERRESTRIAL WILDLIFE

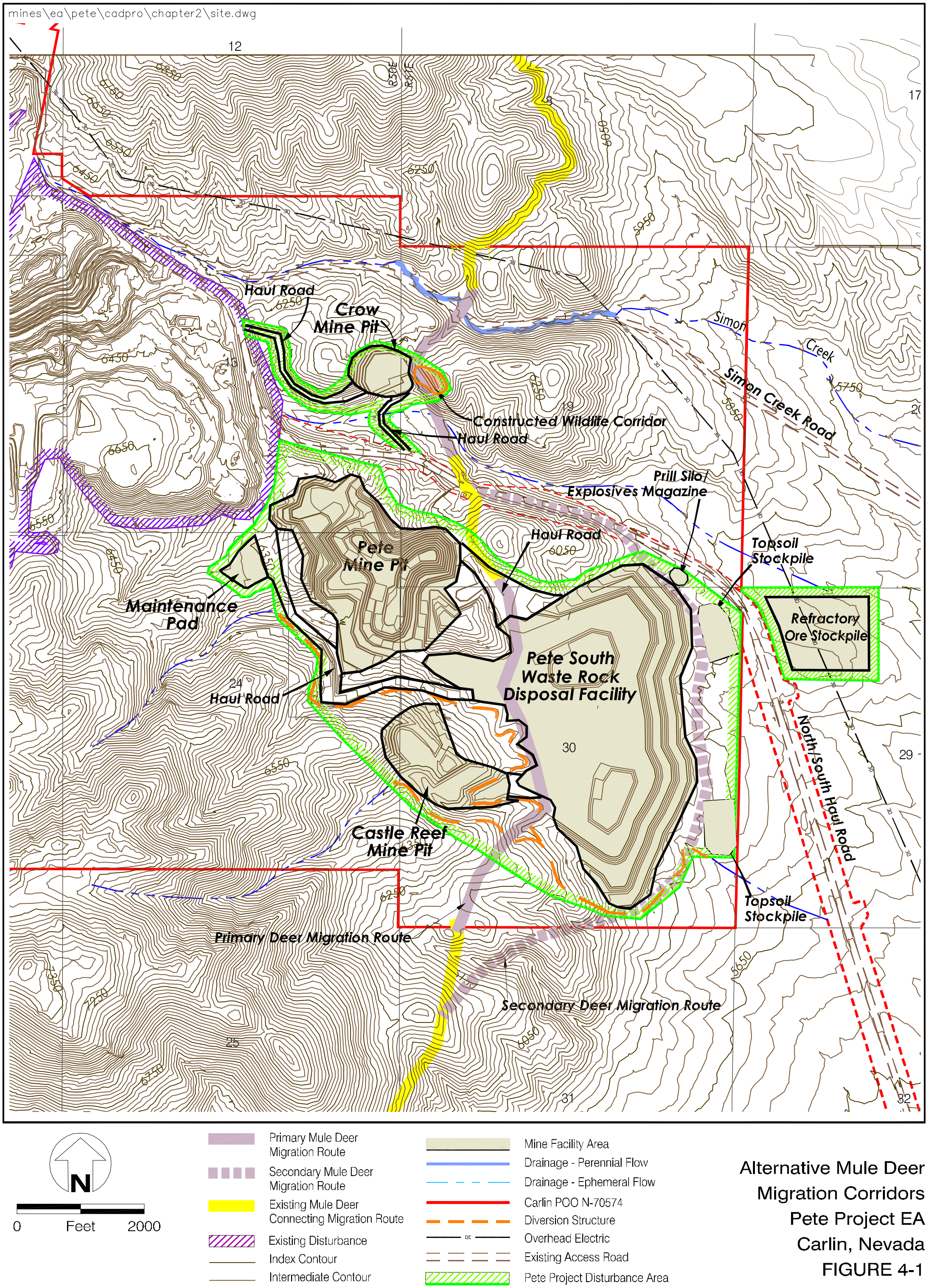
The proposed Pete Project would result in temporary loss of 599 acres (446 acres public land and 153 acres private land), until reclamation efforts are successful in providing low and big-sagebrush-native perennial grassland habitats and mountain brush habitats similar to or equivalent to pre-mining conditions. Approximately 264 acres of open-pits and highwalls would remain (190 acres private land and 74 acres public land) after cessation of mining operations. Direct loss of habitat would include forage, hiding cover, breeding sites, nesting, and thermal cover.

Depending on variables such as species, behavior, density, and habitat, adjacent populations may experience increased mortality, decreased reproductive rates, or other responses. Species affected would be those that rely on big sagebrush-bunchgrass habitat, including: reptiles, small mammals such as deer mice, voles, pygmy rabbits, black-tailed jackrabbits, and Richardson's ground squirrels; birds such as vesper sparrows, rock wrens, sage thrashers, and horned larks; and associated predators such as coyotes and golden eagles.

Covering two seeps/springs (SP-74 and SP-75) as a result of the waste rock disposal facility would be a direct loss of habitat and potential water source for affected wildlife. These seep/spring areas were observed to be flowing only seasonally during 1999-2001 period (severe drought period) and have no wetland or riparian habitat (Brown and Caldwell 2000). They do, however, contain values associated with dry meadow ecological sites, important for habitat diversity to wildlife species. Impacts to these values may be temporary as "french drains", constructed by Newmont during development of the waste rock disposal facility, would allow these seep/springs to flow into down-gradient, unaffected areas of the drainage.

In regard to nesting or breeding habitats (e.g., for wildlife species that establish territories), most habitats are at their respective carrying capacities and would not support additional animals. Displaced individual or groups of animals would be lost from the population. The remaining animals (e.g., non-territorial species) would be concentrated within smaller habitat areas.

The proposed Pete Project would disrupt an existing mule deer migration corridor and effectively restrict migration to a narrow strip. Newmont, in consultation with NDOW and BLM, has attempted to develop a means to provide continued use of the mule deer migration corridor. Newmont would construct the waste rock disposal facility in a manner that would leave the main corridor area, and area below the waste rock disposal facility "footprint" within the Project area, unobstructed during the migration period. The north and south slopes of the waste rock disposal facility would be contoured at a final slope of 3.0H/1.0V as each lift is completed. Edges of the open pits would be bermed to discourage deer access. Additional cuts would be made in the roadside berms located on each side of the North-South Haul Road at locations designated by NDOW and/or BLM, based on field reconnaissance. The road cuts or gaps would be constructed in accordance with the Mine Safety and Health Administration (MSHA) regulations. As stated in the 1992 South Operations Area Project Environmental Impact Statement Mitigation Plan, subject to MSHA approval, gaps of three to five feet would be left in safety berms to provide access for mule deer. Gaps would be created at approximately 150-foot intervals. As described in Chapter 2, active exploration activities (e.g., roads, trenches, and drill pads)



Alternative Mule Deer Migration Corridors
Pete Project EA
Carlin, Nevada
FIGURE 4-1

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would be constructed to facilitate mule deer movement on the north and south slopes. Inactive or abandoned exploration activities would be recontoured to natural topography and revegetated. **Figure 4-1** shows the resulting mule deer migration routes that would be used during mining operations and after reclamation of the site. Additional use of other portions of the former migration corridor between the Pete Project and lower elevation eastern "footprint" of the waste rock disposal facility would be accommodated as part of reclamation efforts to facilitate mule deer migration and intermediate range use upon cessation of mining operations.

Approximately 13,700 acres of public and private land have been rehabilitated in the Bob's Flat-Richmond Mountain-Dunphy Hills area since 1992 with emphasis for rehabilitation of mule deer intermediate range and winter range. Approximately 4,000 acres of public land were rehabilitated as mitigation for effects of Newmont's operations on mule deer range in the Carlin Trend. An additional 781 acres were seeded by BLM as part of wildfire rehabilitation (1999 Welches Fire and 2001 Bob's Flat-Dunphy Fires) on public land. Two projects have been completed in collaboration between BLM, NDOW, Newmont, and Elko Land and Livestock to restore mule deer winter range. These projects were developed to mitigate impacts resulting from Newmont's mining operations in the Carlin Trend. The Dunphy Hills Seeding Project consisted of seeding approximately 1,300 acres in 1993, 570 acres in 1995, and 1,300 acres in 1996 to provide forage and habitat for mule deer and other wildlife.

From 1996 to 1998, Newmont, Elko Land and Livestock, NDOW, and BLM developed and implemented the Bob's Flat Emergency Fire Rehabilitation (EFR) and Mule Deer Mitigation Project. Approximately 3,427 acres were seeded on public land and placed in a mule deer habitat mitigation bank for Newmont. Six Newmont projects totaling 1,526 acres have been withdrawn from the mitigation bank: 800 acres for the South Operations Area Project; 300 acres for the Bootstrap Project; 211 acres for Section 36 Project; 75 acres for the Lantern Project; 139 acres for the South Operations Area Project Amendment; and 1 acre for the Leeville Project. As a result, 1,901 acres remain in the mule deer habitat mitigation bank.

NDOW has completed seedbed preparation on several hundred acres burned as part of the 2001 Bob's Flat and Dunphy Fires on Newmont-owned land. BLM has also seeded approximately 7,400 acres in the South Tuscarora Mountains as part of 1999 Rose Fire mule deer winter range rehabilitation.

Some chukar upland habitat (steep, rocky slopes) would be lost due to the Project, though similar habitat is abundant in adjacent areas. Hungarian partridge are present in low densities throughout the Project area. Loss of upland habitat as a result of the Proposed Action would be minor compared with habitat availability in the study area. Mourning doves would not likely be affected by loss of upland habitat associated with the Proposed Action.

Noise levels associated with the proposed Project would not increase substantially above existing levels; however, the location of the noise source would change with implementation of the Proposed Action. Some animals may be displaced locally an unknown distance from noise sources, though many would likely become habituated to regular noise and resume use of otherwise unaffected habitat.

Impacts of dust, exhaust fumes, and other air pollutants on wildlife may include temporary or permanent displacement due to reduced palatability of vegetation. Impacts would primarily occur downwind from construction and mining and, if measurable, would be minor.

Migratory Birds

The proposed Pete Project would result in temporary loss of 599 acres (446 acres public land and 153 acres private land) until reclamation efforts are successful in providing low and big-sagebrush-native perennial grassland habitats and mountain brush habitats similar to or equivalent to pre-mining conditions. Direct loss of habitat would include forage, hiding cover, breeding sites, nesting, and thermal cover. However, highwalls could provide habitat for several species of birds.

Approximately 264 acres (190 acres private land and 74 acres public land) of open-pits and highwalls associated with the Pete and Castle Reef mines would remain after cessation of mining operations. Covering two seeps/springs (SP-74 and SP-75) as a result of the waste rock disposal facility would be a direct loss of habitat and potential water source for affected migratory bird species. These seep/spring areas were observed to be flowing only seasonally during 1999-2001 period (severe drought period) and have no wetland or riparian habitat (Brown and Caldwell 2000). They do, however, contain values associated with dry meadow ecological sites, important for some species of migratory birds. Impacts to these values may be temporary as "french drains", constructed by Newmont during development of the waste rock disposal facility, would allow these seep/springs to flow into down-gradient, unaffected areas of the drainage.

In regard to nesting or breeding habitats (e.g., wildlife species that establish territories), most habitats are at their respective carrying capacities and would not support additional animals. Displaced individuals or groups of animals would be lost from the population. The remaining animals (e.g., non-territorial species) would be concentrated within smaller habitat areas.

THREATENED, ENDANGERED, CANDIDATE, AND SENSITIVE SPECIES

The proposed Pete Project would result in temporary loss of 599 acres (446 acres public land and 153 acres private land) until reclamation efforts are successful in providing low and big-sagebrush-native perennial grassland habitats and mountain brush habitats similar to or equivalent to pre-mining conditions. Approximately 264 acres (190 acres private land and 74 acres public land) of open-pits and highwalls associated with the Pete and Castle Reef mines would remain after cessation of mining operations. Direct loss of habitat would include forage, hiding cover, breeding sites, nesting, and thermal cover. However, highwalls could provide habitat for raptors and bats.

Covering two seeps/springs (SP-74 and SP-75) as a result of the waste rock disposal facility would be a direct loss of habitat and potential water source for affected special status species. These seep/spring areas were observed to be flowing only seasonally during 1999-2001 period (severe drought period) and have no wetland or riparian habitat (Brown and Caldwell 2000). Therefore, these areas do not provide substantive habitat for special status species associated with these habitat types. They do, however, contain values associated with dry meadow ecological sites, important as sage grouse summer/brood-rearing habitat. Impacts to these values may be temporary as "french drains", constructed by Newmont during development of the waste rock disposal facility, would allow these seep/springs to flow into down-gradient, unaffected areas of the drainage.

In regard to nesting or breeding habitats (e.g., for wildlife species that establish territories), most habitats are at their respective carrying capacities and would not support additional animals. Displaced individual or groups of animals would be lost from the population. The remaining animals (e.g., non-territorial species) would be concentrated within smaller habitat areas. Temporary habitat loss for sage grouse is pending successful rehabilitation of habitat due to reclamation efforts.

Noise levels associated with current traffic along State Highway 766 and the North-South Haul Road would not change substantially with respect to the Pete Project. Intermittent noise generated from mining operations at the Pete Project is not expected to impact the sage grouse lek at Richmond Mountain appreciably more than current noise levels. As mine pits advance in depth, intermittent noise levels from the mine site would diminish because sources would be below grade in the pit areas.

GRAZING MANAGEMENT

The Pete Project would disturb approximately 863 acres of land located entirely within the T Lazy S Grazing Allotment. Most of the Project site is located on public land (506 acres) administered by BLM.

The Proposed Action would result in a reduction of approximately 157 AUMs on land currently open to grazing within the Project area (153 AUMs in the Central Native Pasture and 4 AUMs in the Lower North Native Pasture. Although the proposed land disturbance represents a loss of AUMs for the grazing area, the lack of water in the Project area has reduced cattle use of the site even though it is open to grazing. The reduction of 157 AUMs in the T Lazy S Grazing Allotment represents approximately one percent reduction in AUMs for the entire allotment.

NOISE

The Pete Project would result in an increase and/or continuation of current noise levels generated by mining and ore hauling in the vicinity of the Project area. Major sources of noise from the Project would include loading of waste rock and ore, and truck haulage. Surface equipment including haul trucks and loaders currently used in other nearby mining operations would be used at the Pete Project. Noise generated from the Proposed Action would not impact residential areas. Noise generated by the proposed operations would be typical of most construction and mining projects and could be intense (up to 95 dBA at 75 feet). Potential impacts of noise on wildlife are discussed in the *Terrestrial Wildlife* section of this chapter.

VISUAL RESOURCES

The primary impact of the Proposed Action would be large-scale modification of landforms. Angular, blocky forms and horizontal lines would create strong to moderate contrasts with the natural rounded, rolling hills and ridges of the characteristic landscape. Land clearing and construction of a waste rock disposal facility would expose soil and rock material in a variety of colors ranging from light grayish tan to reddish tan to very dark gray. Contrast between these colors and those existing in the landscape would range from strong to moderate in bright sunlight and when front lighted, to weak to moderate in overcast conditions and when back lighted. **Figure 4-2** depicts the visual impacts that could result from implementation of the Proposed Action.

Clearing vegetation from mine facility areas would create strong to moderate color contrasts with the existing landscape. New lines would be introduced delineating edges of cleared areas and some change in texture would be seen, but overall contrast would be weak.

The mine pits and South Pete Waste Rock Disposal Facility would be located in a Class III Visual Resource Management area. The objective of this class is to partially retain the existing character of the landscape. Changes should repeat the basic elements found in the predominant features of the characteristic landscape. Major elements of the Pete Project including open pits, highwalls, mule deer migration route, and earth-fill structures would remain after mining is completed. Visual contrasts in form, line, and color would remain in post-mining landscape.

In order to meet VRM Class III objectives, all feasible measures should be taken to minimize visual impacts. While it may not be feasible to restore pit highwalls to original contours, it is possible to regrade the South Pete Waste Rock Disposal facility to reflect existing forms, lines, and textures. The South Pete Waste Rock Disposal Facility would likely obscure the view of the Pete pit from KOP #1. The Crow pit would be partially backfilled and blended to match surrounding topography, but portions of the highwall would remain exposed.

Reclamation grading of the waste rock disposal facility can achieve a stable post-mining configuration by rounding angular features and flattening sideslopes. Modifying the flat top surface of the facility and developing variable sideslopes would help reduce visual contrasts created by horizontal lines and trapezoidal forms.

The refractory ore stockpile would be located in Class IV VRM area, which allows management activities that require major modification to the character of the landscape. The refractory ore stockpile represents a short-term impact on visual resources as it would be removed and reclaimed to approximate pre-mining topography upon completion of mining activities.

Re-establishing vegetation on disturbed areas commensurate with pre-mining levels would reduce visual impacts created by horizontal lines and trapezoidal forms.

Figure 4-3 depicts the potential visual effects after reclamation of the mine site is completed.

CULTURAL RESOURCES

Previously unmitigated, National Register eligible properties are not present within the proposed Pete Project area. As a result, the proposed Project would not impact the integrity or character of an eligible property to such an extent that its eligibility would be affected. Archaeological remains associated with 13 ineligible sites and three isolates would be impacted, resulting in loss of those resources.

Although archaeological site CRNV-11-10039 is located outside of the Carlin Plan of Operations boundary, in the event any disturbance in the SE ¼ of section 30 would go beyond the Project area boundary, this site could be damaged or destroyed. Thus, precautions should be undertaken to protect eligible site CRNV-11-10039 from mining operations.

NO ACTION ALTERNATIVE

Implementation of the No Action Alternative would avoid potential direct and indirect impacts of the Proposed Action and would eliminate recovery of approximately 3.8 million tons of ore from the geologic resource. Under the No Action Alternative, the Pete Project would not be approved. Most of the work force for the Project would come from the existing mine-related work force in the Carlin Trend. Negative impacts under the No Action Alternative would include increased unemployment, reduced wages spent in the local economy, decreased revenues to local and state jurisdictions, increased stress on public assistance programs, and decreased quality-of-life of some residents.

CUMULATIVE IMPACTS

Cumulative impact as stated in 40 CFR 1508.7 "… is 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 . . ..”

Results of cumulative impact analyses determine whether an action contributes significantly to impacts associated with other activities in the area, or results in significant impacts when added to other activities. Cumulative impact analyses do not consider potential mitigation for reasonable foreseeable actions.

The Carlin Trend, an area with extensive mine development, is the central feature of the cumulative impacts area. The area is bounded on the northwest by the Ivanhoe Mine, and on the southeast by the Emigrant Mine.

Mine development in the Carlin Trend has principally affected distribution and occurrence of groundwater and surface water in the cumulative impact area. In addition to the Pete Project, other mine activities may be proposed in the area. Cumulative impact analysis included in this section is based on an 8-year life-of-mine for the Pete Project. Cumulative or additive impacts will therefore be described for reasonably foreseeable activities through 2010.

PAST AND PRESENT ACTIVITIES

Mining and livestock grazing have been and continue to be dominant land use activities on private and public land in the cumulative impacts area. Ranching activities include development of springs and groundwater resources for livestock watering, fencing, installation of windmills, development of irrigated pasture, and diversion of groundwater and surface water for irrigation. Livestock grazing has been excluded from most mine areas.

Mining activities in the cumulative impacts area include exploration (drilling, trenching, sampling), development of underground mines, open-pit mining, waste rock disposal, ore milling and processing, tailing disposal, heap leaching, dewatering/discharging, and reclamation. Historic mining activity is discussed in Chapter 2.

New or upgraded power lines have been constructed in the cumulative impacts area to supply energy for mining activities. Access roads constructed along power line corridors facilitate inspection and construction.

REASONABLY FORESEEABLE ACTIVITIES

Reasonably foreseeable activities within the cumulative impacts area include mine development, mineral exploration, mined-land reclamation, livestock grazing, wildlife habitat restoration, transmission line and substation construction, and aquatic habitat restoration. These land uses are expected to continue into the future at varying levels of activity.

MINING ACTIVITIES

Mining is expected to continue as a major activity in the Carlin Trend. **Figure 4-4** shows locations

ProposedActionfromKOP 1
PeteProject EA
Carlin,Nevada
FIGURE4-2

Reclamation from KOP1
Pete ProjectEA
Carlin,Nevada
FIGURE4-3

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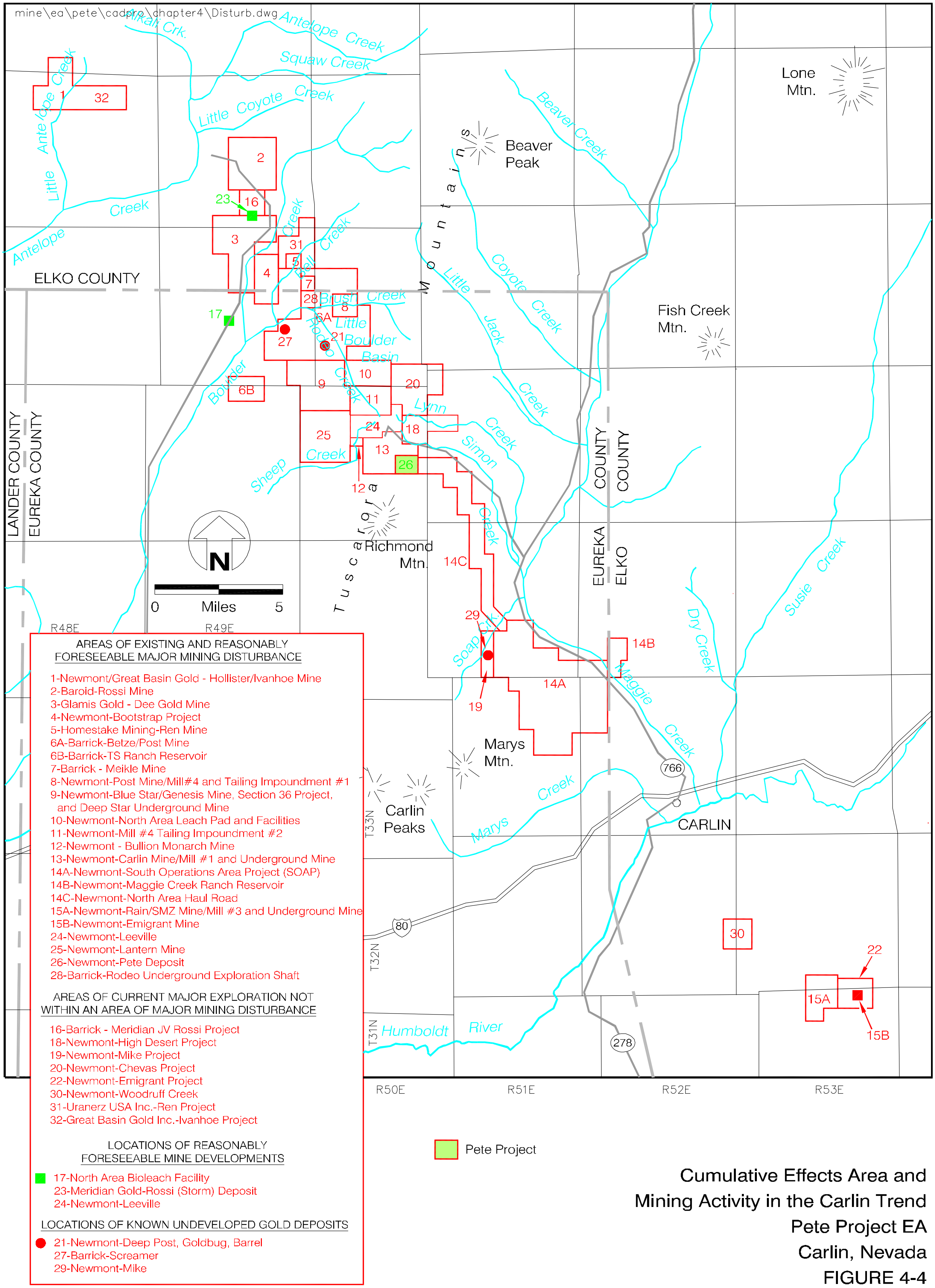

Cumulative Effects Area and
Mining Activity in the Carlin Trend
Pete Project EA
Carlin, Nevada
FIGURE 4-4

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TABLE 4-3
Existing and Reasonably Foreseeable Mining Disturbance in the Carlin Trend

Map Ref. No.	Facility Name	Existing[1] and Reasonably Foreseeable Mining Disturbance (Acres)				Comments and Source of Acreage Information
		Pre-1981	1981-1999	2000-2020	Total	
1	Newmont/Great Basin Gold, Inc. - Hollister/Ivanhoe Mine	0	268	0	268	Mine currently undergoing closure and reclamation. POO-N16-87-002P/Ivanhoe underground is foreseeable action.
2	Baroid - Rossi Mine	100	183	280	563	Active barite mine, currently under exploration for gold. POO-N16-81-003P. Mine expansion is foreseeable action.
3	Glamis Gold Ltd. - Dee Gold Mine	0	802	18	820	POO-N16-83-005P. Mine currently undergoing closure & reclamation
4	Newmont – Bootstrap Project	234	0	1,056	1,290	Active gold mine. POO-N16-94-002P
5	Homestake Mining Co. – Ren Mine	0	62	0	62	Inactive mine and heap leach facility; closure and reclamation in progress. POO-N16-88-005P.
6A	Barrick – Betze/Post Mine	0	6,758	2,615	9,373	Active gold mine with dewatering. POO-N16-88-002P.
6B	Barrick - TS Ranch Reservoir	0	495	0	495	Reservoir for discharged mine water from Betze/Post Mine. POO-N16-88-002P.
7	Barrick – Meikle Mine	0	92	0	92	Underground gold mine with dewatering. POO-N16-92-002P
8	Newmont – Post/Mill #4 & Tailing Impoundment #1	0	884	0	884	Existing mill and tailing facility. POO-N16-88-008P
9	Newmont- Blue Star/Genesis Mine, Sec. 36 Project (North Star, Bobcat, Payraise, Sold and Beast Pits), & Deep Star underground mine	200	1,290	1,022	2,512	Active gold mines. POO-N16-88-007P
10	Newmont – North Area Leach Facility	0	494	169	663	Existing leach pad facility. POO-N16-88-007P.
11	Newmont-Mill#4 Tailing Impoundment #2	0	280	15	295	Existing tailing facility. POO-N16-88-008P
12	Newmont – Bullion Monarch Mine (formerly Universal Gas)	50	0	0	50	Inactive mine, mill and tailing facility; closure and reclamation in progress. Notice N16-81-013N
13	Newmont – Carlin Mine/Mill #1 and Underground Mine	0	1,598	0	1,598	Active gold mine. Expansion (Pete Project) permitting in progress. POO-N16-81-010P
14A	Newmont – South Operations Area Project (SOAP)	0	7,960	1,320	9,280	Active gold mine. Expansion permitting in progress. POO-N16-81-009P
14B	Newmont – Maggie Creek Ranch Reservoir	0	300	0	300	Reservoir for discharged mine water from Gold Quarry Mine. POO-N16-81-009P.
14C	North Area Haul Road	0	189	0	189	North-South haul road. POO-N16-81-009P.
15A	Newmont - Rain and SMZ Mine/Mill #3 and Underground Mine	0	954	7	961	Active gold mine. POO-N16-86-007P. Expansion permitting in progress (Emigrant Project).
15B	Newmont - Emigrant Mine	0	0	418	418	Proposed open-pit gold mine; permitting in progress. Expansion of Rain Mine Project. POO-N16-86-007P.
17	North Area Bioleach Facility	0	0	600[2]	600	Foreseeable gold leach operation (Newmont).
23	Meridian Gold-Rossi (Storm) Deposit	0	0	100[2]	100[2]	Foreseeable underground mine.
24	Newmont – Leeville	0	0	486	486	Proposed underground mine and facilities. POO-N16-97-004P
25	Newmont – Lantern Mine	0	235	394[2]	629	Open pit gold mine and foreseeable expansion. POO-N16-88-007P
26	Newmont - Pete Project	0	0	863	863	Proposed open pit gold mine and leach operation. Expansion of Carlin Mine. POO-N16-81-010P
28	Barrick-Rodeo/Goldbug Underground Exploration Shaft	0	0	50	50	Underground mine.
35	Great Basin Gold-Underground Mine	0	0	100[2]	100[2]	Foreseeable underground mine.
36	Newmont-Chukar Footwall Underground Project	0	0	0	0	Foreseeable underground mine.
Total Disturbance Acres		**584**	**22,844**	**9,513**	**32,941**	

1. Projects permitted by BLM as of 2/4/00
2. Acreages for reasonably foreseeable disturbances (1998-2020) are estimates subject to change upon submittal of the actual proposal.

Note: Exploration projects shown in **Figure 4-4** total 1,124 acres; Newmont Chevas (POO-N16-93-002P) = 168 acres; Newmont Mike (POO-N16-92-004P) = 48 acres; Newmont High Desert (POO-N16-92-003P) = 164 acres; Newmont Emigrant (POO-N16-93-001P) = 63 acres; Barrick Meridan JV Rossi (POO-N16-90-002P) = 51 acres; Newmont Woodruf Creek (POO-N16-96-002P) = 66 acres; Cameco (US) REN (POO-N16-97-003P) = 30 acres; Newmont Carlin (POO-N16-81-002P) = 255 acres; Great Basin Gold Ivanhoe (POO-N16-93-003P) = 15 acres; Barrick Dee (POO-N16-98-001P) = 21 acres; Barrick Goldstrike (POO-N16-98-002P) = 233 acres; Barrick Storm Decline (POO-N16-99-001P) = 10 acres.

TABLE 4-4
Existing and Reasonably Foreseeable Mining Disturbance in the Carlin Trend from Open-Pits Only

Map Reference Number	Facility Name	Existing[1] and Reasonably Foreseeable Mining Disturbance for Open-Pits Only (Acres)				Comments and Source of Acreage Information
		Pre-1981	1981-1999	1999-2020	Total	
1	Newmont/Great Basin Gold, Inc. - Hollister Mine	0	54	0	54	Open pit gold mine currently undergoing closure and reclamation. POO-N16-87-002P.
2	Baroid - Rossi Mine	0	80	100[2]	180	Active barite mine, currently under exploration for gold. POO-N16-81-003P. Expansion of open pit is a foreseeable future action.
3	Glamis Gold Ltd. – Dee Gold Mine	0	136	248	384	Closure and Reclamation in progress. POO-N16-83-005P.
4	Newmont – Bootstrap Project	59	0	155	214	Active gold mine. POO-N16-94-002P. Capstone Pit has been backfilled (approximately 10 acres).
5	Homestake – Ren Mine	0	5	0	5	Inactive mine and heap leach facility; closure and reclamation in progress. POO-N16-88-005P
6A	Barrick – Betze/Post Mine	0	1,412	0	1,412	Active gold mine with dewatering. POO-N16-88-002P
9	Newmont - Blue Star/Genesis Mine and Section 36 Project (North Star, Bobcat, Payraise, Sold and Beast Pits)	50	506	420	976	Active open-pit and underground gold mines. POO-N16-88-007P
12	Newmont – Bullion Monarch Mine (formerly Universal Gas)	6	0	0	6	Inactive open pit mine, mill and tailing facility; closure and reclamation in progress. Notice N16-81-013N
13	Newmont – Carlin Mine	100	226	0	326	Active gold mine. POO-N16-81-010P
14A	Newmont- South Operations Area Project (SOAP)	0	815	1,158	1,973	Active gold mine with dewatering. POO-N16-81-009P
15A	Newmont - Rain and SMZ Mine	0	165	7	172	Active gold mine. POO-N16-86-007P
15B	Newmont - Emigrant Project	0	0	123	123	Proposed open pit gold mine. Permitting in progress; POO-N16-87-006P
25	Newmont – Lantern	0	53	47[2]	100	Active open pit gold mine and foreseeable mine expansion. POO-N16-88-007P
26	Newmont - Pete Mine	0	0	264	264	Proposed open pit gold mine; Permitting in progress. POO-N16-81-010P
Total Disturbance Acres From Open Pits Only		215	3,452	2,481	6,148	

[1] Projects permitted by BLM as of 2/4/00.
[2] Acreages for reasonably foreseeable disturbances (1998-2020) are estimates subject to change upon submittal of the actual proposal.

of existing and reasonably foreseeable mining and exploration sites in the Carlin Trend.

The boundaries shown on **Figure 4-4** for the mining operations delineate areas where disturbance has occurred or is expected to occur. These boundaries represent the outer limits of major surface disturbance but do not imply that all the area within the boundaries would be disturbed. Acreage for existing and reasonably foreseeable mining disturbances are listed in **Table 4-3.**

Disturbances related to mine development include mine pits, processing facilities, heap leach pads, waste rock disposal facilities, tailing impoundments, haul roads, and administrative offices. Exploration on undisturbed land is not necessarily included within boundaries shown on **Figure 4-4**. Acreages of open-pit disturbance not scheduled for reclamation are listed in **Table 4-4**.

Existing mines are shown on **Figure 4-4** and details regarding these mines are presented in **Table 4-3** and **Table 4-4.** The Goldstrike Property is currently undergoing environmental review for dewatering and water management operations. The Goldstrike Property consists of the Betze/Post open pit mine and Meikle underground mine. Exploration projects that may be developed as mining projects in the near future are shown on **Figure 4-4.**

The largest mine dewatering program in the Carlin Trend occurs at the Goldstrike Property (North Operations Area) and Gold Quarry Mine (South Operations Area), where current dewatering rates are approximately 30,000 and 20,000 gpm, respectively. Dewatering rates vary seasonally and are expected to continue until 2011. Water from the Goldstrike Property dewatering system is pumped to Boulder Valley where it is infiltrated and/or used for irrigation. A large portion of water that infiltrates into the basin from the TS Ranch Reservoir reappears as three spring complexes approximately 5 miles south of the reservoir. Excess water from the Gold Quarry Mine is discharged to Maggie Creek and irrigated land near the creek. Cumulative effects to seeps/springs are addressed in Environmental Impact Statements for Newmont's South Operations Area Project Amendment (BLM 2000b) and Leeville Project (BLM 2002).

Cumulative impacts from the Proposed Action would be negligible for all resources except terrestrial wildlife, air quality, grazing management, and visual resources. The Proposed Action would result in incremental impacts to these resources.

The geographic area included in the analysis of cumulative effects is described in the introductory part of this chapter. The description of the cumulative effects includes past, present, and reasonably foreseeable activities in the Carlin Trend.

AIR QUALITY

Fugitive dust and gaseous emissions from nearby mining operations affect air quality in the Project area. The Pete Project would create continued and extended haul truck traffic on the North-South Haul Road as well as extended operation of processing facilities at the North and South Operations Areas. Ambient air quality data for the region currently reflects impacts of existing mining operations in the airshed. Approximately 2,000 pounds of mercury and mercury compounds was reported released annually by mining operations in the Carlin Trend (NDEP 2000).

TERRESTRIAL WILDLIFE

Mule deer would be subject to cumulative impacts from mining activity, degradation of habitat as a result of wildfires, degradation of habitat by livestock grazing, and seeding of native range by introduced herbaceous species. The cumulative impacts study area for mule deer includes nearly 1.5 million acres of public and private land that extends north to the Duck Valley Indian Reservation and south to Crescent Valley (BLM 1992). Past and proposed activities would interact cumulatively to further reduce available acreage and quality of transitional mule deer range (mining activities) and winter range (wildfire and conversion of native shrub and grasslands to seeded pasture and range). The Pete Project is located in transition range, also called linkage habitat, used by mule deer migrating between high-elevation summer range to the north and low-elevation winter range to the south.

Currently, much of the proposed Project area and adjacent areas have been degraded by fires that have converted native shrub communities to cheatgrass-dominated grasslands. Migrating mule deer avoid these areas because of scarcity of food and resting cover. Vegetation that provides forage and security cover to deer (primarily shrubs) would need to be established before deer would use lower-elevation habitat in the Boulder Valley as winter range or transitional habitat.

Mining development in the cumulative effects area may further alter timing and location of traditional migration routes and may contribute to shifts in winter range use from the Dunphy Hills and southern portion of the Tuscarora Range to winter range in the Izzenhood and Sheep Creek ranges. The significance of major shifts in winter range use and migration routes is not known. However, it is likely that additional stress would occur to animals wintering in the Izzenhood and Sheep Creek ranges due to increased demands for forage by animals, which previously wintered in the Dunphy Hills and surrounding area.

In Nevada, and throughout most of the west, winter range is crucial to survival of mule deer. Availability and quality of winter range is the primary factor that determines regional carrying capacity of year-round habitat. Additional impacts to transition range result in deer moving through transition range more rapidly, and therefore, onto winter range earlier in the season. This early occupancy of winter range increases the demand on the limited quality and quantity of the existing winter ranges.

Existing and reasonably foreseeable surface disturbances created by mining operations in the Carlin Trend within the mule deer cumulative impacts study area totals approximately 32,962 acres, or 2 percent of the total cumulative surface disturbance. Mule deer habitat within the Carlin Trend is composed of crucial linkage habitat. In the mule deer cumulative impacts study area, mining activities occur on approximately 1 percent of crucial winter range, 2 percent of crucial summer range, and 9 percent of crucial linkage habitat (BLM 1996).

The loss of 264 acres of big sagebrush /grassland steppe and mountain brush habitat would occur as a result of the proposed Pete Project. This would be in addition to approximately 5,886 acres of open-pits that would not be reclaimed in the Carlin Trend. However, pit highwalls provide habitat to several species of birds and bats.

Cumulative effects to terrestrial wildlife species from implementation of the Proposed Action would be limited to short-term incremental disturbance of the sagebrush/grassland community in the Project area. This disturbance would result in short-term animal displacement and reduction in potential habitat for big game, upland game birds, raptors, songbirds, and amphibians that typically occupy this habitat type in conjunction with other surface disturbances caused by mining activities, livestock grazing, and agricultural operations in the area. Based on Newmont’s reclamation plan, the temporary and limited nature of the surface disturbance and habitat loss would be minimal.

GRAZING MANAGEMENT

Incremental impacts to grazing management of the T Lazy S and Mary’s Mountain allotments has occurred since 1990 when 2,965 AUMs were suspended from active grazing in the Betze Mine area. AUM reductions from subsequent mine development has included 173 AUMs (T Lazy S) from the South Operations Area Project, 36 AUMs (T Lazy S) from the Leeville Project, 71 AUMs (Mary’s Mountain) from the South Operations Area Project Amendment, and 99 AUMs from the Lantern Mine. Total AUM reductions from these mine projects (including the Pete Project) is 3,501.

VISUAL RESOURCES

Cumulative/Residual impacts on visual resources could remain for ten, twenty or more years following cessation of operations and reclamation of developed sites until native vegetation is reestablished on disturbed areas. Areas where reclamation is not complete or successful would continue to contrast with visual resources. Any evidence of reclaimed roads may invite continued use by the general public, thereby perpetuating linear intrusions in the characteristic landscape. Reclamation would attempt to duplicate the existing landforms to minimize contrasts with visual resources but would not be successful in totally eliminating them.

MITIGATION AND MONITORING MEASURES

MITIGATION

Of the 1,901 acres available in the mule deer habitat mitigation bank, 264 acres would be applied as mitigation for mule deer habitat permanently lost due to the Pete and Castle Reef pits. The Crow pit would be mitigated with the Proposed Action. Therefore, 1,637 acres would remain available in the mule deer habitat mitigation bank**.**

As a result of the permanent loss of 74 acres of public land from the Pete and Castle Reef pits, Newmont would provide off-site enhancement of 74 acres of sage grouse habitat. Enhancement would involve mechanical and/or chemical manipulation or prescribed burning of mature stands of sagebrush (greater than 15 percent shrub foliar cover) in a patchwork pattern, and reseeding the area with an appropriate herbaceous seed mix to improve forage diversity and cover for sage grouse. The priority of this action would be habitat enhancement for affected sage grouse populations within the T Lazy S Allotment. The 74 acres would be treated in this manner on a one-time basis, within three years of issuance of the Decision Record.

MONITORING

A BLM representative would conduct regular field inspections throughout construction, operation, and reclamation activities associated with the Proposed Action. All field compliance inspections would be documented in the Project file at the BLM Elko Field Office.

A Newmont representative would conduct periodic monitoring and documentation or erosion control and sedimentation structures; and evaluate surface erosion relative to individual mine units. Annual observations would be conducted to visually assess the function of erosion control mechanisms and structures that have been constructed, and the overall erosional stability of the area. Upon consultation with and approval by BLM and NDEP, appropriate measures would be taken to implement corrective action when required.

Newmont would continue to implement the existing waste rock monitoring program. A copy of the Water Pollution Control Reports required by NDEP as a condition of the Water Pollution Control Permit would also be submitted to BLM by Newmont.

Newmont would be required to monitor for waste rock seepage for up to 30 years after reclamation is completed at the Pete Project site. This monitoring period would be reviewed periodically by the agencies to determine if modifications warranted and whether long-term bonding would be necessary.

During the life of the Pete Project, BLM, NDOW, and Newmont would conduct an annual inspection in August of the primary and secondary mule deer migration routes within the boundary of the Carlin Plan of Operations (**Figure 4-1**). During the inspection, any barriers or obstructions (e.g., steep slopes-cuts, fill slopes, berms, structures, etc.) would be identified and means to mitigate barriers/ obstructions would be agreed upon prior to the fall mule deer migration. A written schedule for mitigation actions would be documented with all parties with BLM documentation placed in the 3809 Surface Management Minerals file at the Elko Field Office.

RESIDUAL ADVERSE EFFECTS

Residual impact from the Proposed Action after implementing mitigation measures would include irreversible commitments of public land resources. Gold would be removed from the geologic resource under the Proposed Action. Mine pits would result in a loss of 264 acres of vegetation, 19 AUMs for livestock grazing, and 264 acres of wildlife habitat. The landscape characteristics would change as a result of the Proposed Action and reclamation activities. Although the disturbed areas would be reclaimed, including seeded, and Newmont has a program to inventory and treat invasive, nonnative weed species, the area could become infested with invasive, nonnative weed species.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Resources that would be irreversibly lost as a result of the Proposed Action include fuel used to mine the ore and waste rock materials and the energy used to process the ore to recover precious metals. Mine pits remaining after reclamation of the mine site would represent an irretrievable loss of productive land surface.

Soil lost during salvage, stockpiling, and replacement activities represent an irretrievable loss of the soil resource. An irretrievable commitment of resources would occur to the visual resource until reclamation is successful.

CHAPTER 5

CONSULTATION AND COORDINATION

LIST OF PREPARERS AND REVIEWERS

LEAD AGENCY – BUREAU OF LAND MANAGEMENT

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Mark Coca – Invasive, Nonnative Species
Roger Congdon – Air/Water Resources
JuLee Pallette – Recreation/VRM

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CHAPTER 6
REFERENCES

Adkins, A. and J. Rota. 1984. General Geology of the Carlin Gold Mine. Field Trip 1. Sediment Hosted Gold Deposits. AEG 1984 Proceedings. Reno, Nevada.

Algermissen, S., D. Perkins, P. Thenhaus, S. Hanson, and B. Bender. 1982. Probabilistic estimates of maximum earthquake acceleration and velocity in rock in the contiguous United States. Open File Report 82-1033. U.S. Geological Survey.

_______1990. Probabilistic earthquake acceleration and velocity maps for the United States and Puerto Rico. U.S. Geological Survey. Map MF-2120.

Bowles, A. 1995. Responses of Wildlife to Noise *in* Wildlife and Recreationists; Coexistence Through Management and Research. Island Press. Washington D.C.

Brown and Caldwell. 2000. Final Pete Jurisdictional Wetlands and Waters of the United States Delineation Report, Newmont Mining Corporation. Prepared for Newmont Mining Corporation.

Bureau of Land Management (BLM), U.S. Department of the Interior. 1987. Elko Final Wilderness Environmental Impact Statement. Elko Field Office. Elko, Nevada.

_______1991. Draft Environmental Impact Statement, Betze Project. Barrick Goldstrike Mines, Inc. Elko Field Office. Elko, Nevada.

_______1992. Dee Gold Cumulative Effects Analysis for Mule Deer and Pronghorn Antelope. Elko Field Office. Elko, Nevada.

_______1993. Environmental Impact Statement, Newmont Gold Company's South Operations Area Project. Includes Draft EIS, Final EIS, and Mitigation Plan. Elko Field Office. Elko, Nevada.

_______**1995.** Memorandum addressed to the Elko Land and Livestock Grazing Case File. January 23, 1995. Elko Field Office. Elko, Nevada.

_______**1996.** Draft Environmental Impact Statement, Newmont Gold Bootstrap Project. Elko Field Office. Elko, Nevada.

_______**1998.** Memorandum addressed to the Elko Land and Livestock Grazing Case File. February 5, 1998. Elko Field Office. Elko, Nevada.

_______**1999.** Out of ashes, opportunity. National Office of Fire and Aviation. Boise, Idaho

_______2000a. Cumulative Impact Analysis of Dewatering and Water Management Operations for the Betze Project, South Operations Area Project Amendment, and Leeville Project. Elko Field Office. Elko, Nevada.

_______2000b. Draft Environmental Impact Statement, Newmont Mining Corporation’s South Operations Area Project Amendment. Elko Field Office. Elko, Nevada. September.

_______**2002.** Draft Environmental Impact Statement, Newmont Mining Corporation Leeville Project. Elko Field Office. Elko, Nevada. March.

Coope, J. 1991. Carlin Trend Exploration History: Discovery of the Carlin Deposit: Nevada Bureau of Mines and Geology. Special Publication No. 13.

Cronquist, A., A. Holmgren, N. Holmgren and J. Reveal. 1972. Intermountain Flora Vascular Plants of the Intermountain West, U.S.A. Vol. 1. Hafner Publishing Co., New York.

dePolo, D. and C. dePolo. 1999. Earthquakes in Nevada 1852-1998. Nevada Bureau of Mines and Geology Map 119.

Gray, K. 2002. Personal communication with K. Wilkinson, BLM Elko Field office. May.

Harvey, B. 1991. Structural Overview of the Carlin Trend, Nevada. Geology and ore deposits of the Great Basin Field Trip Guidebook, Volume 2. Great Basin Symposium April 1990. Geologic Society of Nevada. Reno.

Hawthorne, T. 2001. Personal communication October 25, 2001. Outdoor recreation planner. Elko District Office. Elko, Nevada.

Hydrologic Consultants, Inc. 1999. Prediction of Potential Hydrologic Impacts of Dewatering Operations Along Northern Carlin Trend. Prepared for Newmont Gold Company. HCI-878. May.

Jackson, M., M. Lane and B. Leach. 1997. Geology of the West Leeville Deposit. Society of Economic Geologists, 16-18.

Jones, J., S. Kenzle, A. LaFond, D. Newsome, B. Tipps, and D. Zeanah. 1994. Site Specific Data Recovery Plan for Three Prehistoric Sites in the Proposed Gold Quarry Haul Road Project Corridor, Northeastern Eureka County, Nevada. Cultural Resources Report 5035-02-9404. P-III Associates, Inc., Salt Lake City. Submitted to Bureau of Land Management, Elko Field Office. Elko, Nevada.

Lamp, R. 2002. Personal communication. Wildlife biologists with Nevada Division of Wildlife. Elko, Nevada.

Lewicki, G. 1997. Leeville project Erosion Analysis: Newmont/Barrick Joint Venture. Submitted to Newmont Gold Company by Lewicki and associates. April.

McFarlane, D. 1991. Gold Production on the Carlin Trend *in* Buffa, R. and A. Coyner, Geology and Ore Deposits of the Great Basin.

Nevada Division of Environmental Protection (NDEP). 2000. Mercury Emissions from Major Mining Operations in Nevada. November.

_______2002. Bureau of Air Quality Internet Website.

Nevada Partners in Flight Bird Conservation Plan. 1999. The Nevada Partners in Flight Working Group. L. Neel, edit. November.

Nevada State Conservation Commission. 1994. Handbook of Best Management Practices.

Newmont Mining Corporation (Newmont). 1995. Proposed Plan of Operations for the Bootstrap Project Open Pit Mines, Heap Leach Facility and Waste Rock facility. Revised September 1995.

_______1997. Refractory Ore Stockpile and Waste Rock Dump Design, Construction, and Monitoring Plan.

_______1998. Pete and Perry Projects Hydrologic Study. March.

_______**1999.** Carlin Operations Area Proposed Plan of Operations for the Pete Project (N16-81-010P). Submitted to Bureau of Land Management. Elko District Office. Elko, Nevada. July.

_______**2001a.** Response to Comments Pete Amendment to the Carlin Plan of Operations N-70574, and Request for Amendment. August.

_______**2001b.** Emergency Response Plan. September.

_______**2001c.** Maggie Creek Basin Monitoring Plan, First Quarter 2001 Report. Carlin, Nevada.

_______**2001d.** Spring Survey Gold Quarry Fall 2000. Hydrology Department. March.

_______**2002a.** Newmont Mining Corporation Revised Plan of Operations for the Pete Project. May.

_______**2002b.** Memo from P.Pettit, Hydrology Manager, Newmont Mining Corporation to D. Rogness, Maxim Technologies, Inc.

Nyrehn, D. 1998. Personal communication January 22, 1998. Rangeland Management Specialist, Bureau of Land Management. Elko Field Office. Elko, Nevada.

_______**2002.** Personal communication, February 15, 2002. Rangeland Management Specialist, Bureau of Land Management, Elko Field Office, Elko, Nevada.

Resource Concepts, Inc. (RCI). 1998. Order II soil survey for the Leeville Mine Project Area. Prepared for Maxim Technologies, Inc.

Ryall, A. 1977. Earthquake Hazard in the Nevada Region. Bulletin of the Seismological Society of America. Volume 67, No. 2, pp. 517-532. April.

Tuttle, M. and D. Taylor. 1994. Bats and mines. Bat Conservation International Resource Publication No. 3. Austin, Texas.

University of Nevada, Agriculture Experiment Station. 1981. Landforms of the Basin and Range province, Defined for Soil Survey. Technical Bulletin 28. Reno.

U.S. Dept. of Agriculture. Natural Resource Conservation Service (NRCS). 1980. (Formerly Soil Conservation Service). Soil Survey of Tuscarora Mountain Area, Parts of Elko, Eureka and Lander Counties, Nevada.

_______**1993.** Soil Interpretation Rating Guide.

U.S. Environmental Protection Agency (EPA). 2002. Office of Air Quality Planning and Standards. AIRSData.

U.S. Geological Survey (USGS). 1988. Geologic Survey Quad 1:100,000 Battle Mountain, Nevada.

_______**1998.** Water Resources Data, Nevada Water Year 1998.

_______**2000.** Water Resources Data , Nevada Water Year 2000.

Western Regional Climate Center. 2002. National Climate Data Center (NCDC) Monthly Normals for Beowave (1949-2000), Newmont's Carlin Mine (1966-2000), Elko (1888-2000), and Tuscarora (1957-2000), Nevada Stations. http://www.wrcc.dri.edu/cgi-bin/.

Zimmerman, C., T. Shepherd and T. Tempel. 1988. Geology and Process Mineralogy of the Gneiss Gold Deposit. Unpublished manuscript for Newmont Gold Company. Denver, Colorado.

APPENDIX A

SOIL MAP UNITS

PETE PROJECT AREA

TABLE A-1
Soil Map Units for the Pete Project Area

NRCS Map Unit	Major Soil Component and Surface Texture	Characteristics	Runoff	Effective Rooting Depth/Depth to Bedrock	Permeability	Available Water Holding Capacity	Erosion Hazard		Description
							Water	Wind	
Donna-Simon association DM	60% Donna gravelly loam	Moderately deep and well drained	Medium	20-26 inches	Very slow	Low	Moderate	Moderate	Donna gravelly loam: surface layer consists of 8 inches of gravelly loam; subsoil is composed of 14 inches of heavy clay; upper 16 inches of substratum consists of indurated, silica-cemented hardpan; lower part of the substratum to depth of 68 inches is stratified, very gravelly loam and very gravelly sandy clay loam.
	20% Simon loam	Very deep and well drained	Slow	60 inches or more	Moderately slow	High	Slight	Moderate	Simon loam: surface layer consists of 12 inches of loam; subsoil is 29 inches thick clay loam; substratum to depth of 60 inches or more is very gravelly clay loam to very gravelly sandy clay loam.
Ramires-Chen-Bobs association RF	40% Ramires gravelly loam	Moderately deep and well drained	Rapid	24-40 inches	Slow	Low	High	Slight	Ramires gravelly loam: surface layer consists of 6 inches gravelly loam; subsoil consists of 18 inches gravelly clay to gravelly sandy clay; substratum is 6 inches thick loam.
	20% Chen cobbly loam	Shallow and well drained	Medium	12-20 inches	Very slow	Very Low	High	Slight	Chen cobbly loam: surface layer consists of 8 inches of cobbly loam: subsoil is 9 inches thick very gravelly clay.
	20% Bobs gravelly loam		Medium	10-20 inches			Moderate	Moderate	Bobs gravelly loam: surface layer consists of 4 inches gravelly loam; 4 to 12 inches deep the soil layer consists of gravelly loam; 12 inches deep is an indurated, lime-cemented hardpan.
Taylor Creek-Chen Association TA	40% Taylor Creek loam	Very deep and well drained	Rapid	60 inches or more	Very slow	High	High	Slight	Taylor Creek loam: surface layer is typically 15 inches thick loam; upper 25 inches of subsoil consists of a gravelly fine clay; the lower 20 inches consists of a gravelly clay.
	20% Chen cobbly loam	Shallow and well drained	Rapid	12-20 inches	Slow	Low	High	Slight	Chen cobby loam: surface layer consists of 8 inches cobbly loam; subsoil consists of 9 inches of gravelly clay.
	20% Ramires gravelly loam	Moderately deep and well drained	Rapid	24-40 inches	Slow	Low	High	Slight	Ramires gravelly loam: surface layer consists of 6 inches gravelly loam; subsoil consists of 18 inches gravelly clay to gravelly sandy clay; substratum is 6 inches of sandy loam.

NRCS = Natural Resource and Conservation Service (formerly Soil Conservation Service)
Source: NRCS 1980.

The major soil components in an undisturbed state for DM and TA soil map units were used to evaluate the potential for use as reclamation material. The NRCS (1993) "*Soil Interpretations Rating Guide*" rates suitability of soil using the major properties that influence erosion and stability of the surface and the productive potential of reconstructed soil. Based on this information, DM and TA soil map units have been assigned a rating of good, fair, or poor using the most limiting characteristic of the map unit component. Those properties and ratings are presented in the following table. A rating of "good" means that vegetation is relatively easy to establish and maintain, that the surface is stable and resists erosion, and that the reconstructed soil has good potential productivity. A rating of "fair" indicates that the soil can be vegetated and stabilized by modifying one or more properties. Top dressing with better material or application of soil amendments may be necessary for satisfactory performance. A rating of "poor" indicates that the soil may be unsuitable for specific uses if it has one or more restrictive properties. Coarse fragment content and/or shallow depth to a restrictive layer are the most common limiting characteristics for salvage potential of a soil.

TABLE A-2
Suitability of Soil for Salvage
Pete Project Area

Soil Map Unit	Soil Series	Limiting Characteristic	Recommended Soil Salvage Depth (in)	Potential Soil Salvage Area (acres)	Growth Medium Salvage Volume (cy)	Salvage Rating
Donna-Simon Association (DM) 377 acres	Donna (60%)	Shallow depth (duripan at 20 to 26 inches)	20	226	608,904	Fair
	Simon (20%)	High gravel (50%) and moderate cobble (15%) content at depths below 28 inches	40	75	402,930	Fair
	Stampede (5%)	Shallow depth (duripan at 20 to 32 inches)	20	19	51,191	Fair
	Pie Creek (5%)	High hazard of water erosion and shallow depth (bedrock at 24 to 40 inches)	24	19	61,306	Fair
	Short Creek (10%)	Occurs on 30 to 75% slopes and has high hazard of water erosion	30	38	153,266	Poor
Taylor Creek-Chen Association (TA) 486 acres	Taylor Creek (40%)	Occurs on 30 to 50% slopes and has high hazard of water erosion	36	194	938,960	Poor
	Chen (20%)	High hazard of water erosion, shallow depth (bedrock at 12 to 20 inches), and moderate cobble (20%) and gravel (32%) content	12	97	156,493	Poor
	Ramires (20%)	Occurs on 30 to 50% slopes, has high hazard of water erosion, and shallow depth (bedrock at 24 to 40 inches)	20	97	261,343	Poor
	Mosquet (10%)	Shallow depth (bedrock at 6 to 20 inches), and high gravel and cobble (39%) content	6	49	39,526	Poor
	Taylor Creek and Ramires (2%)	As above	20 to 36	10	37,590	Poor
	Rock Outcrop and undefined soils (8%)	Not Applicable (N/A)	N/A	N/A	N/A	N/A
			TOTALS	824	1,772,549	

in = inches; cy = cubic yards

Source: NRCS 1993.

APPENDIX B

GENERAL WILDLIFE SPECIES LIST

PETE PROJECT AREA

TABLE B-1 General Wildlife Species List Lower Sagebrush/Grassland Steppe	
Northeastern Nevada Birds	
Turkey Vulture	*Cathartes aura*
Bald Eagle	*Haliaetus leucocephalus*
Northern Harrier	*Circus cyaneus*
Swainson's Hawk	*Buteo swainsoni*
Red-tailed Hawk	*Buteo jamaicensis*
Ferruginous Hawk	*Buteo regalis*
Rough-legged Hawk	*Buteo lagopus*
Golden Eagle	*Aquila chrysaeros*
American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Prairie Falcom	*Falco mexicanus*
Gray Partridge	*Perdix perdix*
Chukar	*Alectoris chukar*
Sage Grouse	*Centrocercus urophasianus*
Mourning Dove	*Zenaida macroura*
Great Horned Owl	*Bubo virginianus*
Burrowing Owl	*Athene cunicularia*
Short-eared Owl	*Asio flammeus*
Common Nighthawk	*Chordeiles minor*
Broad-tailed Hummingbird	*Selasphorus platycercus*
Northern Flicker	*Colaptes auratus*
Gray Flyctcher	*Epidonax wrightii*
Ash-throated Flycatcher	*Myiarchus cinerascens*
Say's Phoebe	*Sayornis saya*
Western Kingbird	*Tyrannus verticalis*
Horned Lark	*Eremophila alpestris*
Barn Swallow	*Hirundo rustica*
Black-billed Magpie	*Pica pica*
American Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*
Rock Wren	*Salpinctes obsoletus*
Mountain Bluebird	*Silaia currocoides*
American Robin	*Turdus migratorius*
Sage Thrasher	*Oreoscoptes montanus*
Loggerhead Shrike	*Lanius ludovicianus*
Northern Shrike	*Lanius excubitor*
European Shrike	*Sturnus vulgaris*
Brewer's Sparrow	*Pooecetes gramineus*
Vesper Sparrow	*Chondestes grammacus*
Lark Sparrow	*Amphispiza belli*
White-crowned Sparrow	*Zonotrichia leucophrys*
Lapland Longspur	*Calcarius lapponicus*
Red-winged Blackbird	*Agelaius phoeniceus*
Western Meadowlark	*Sturnella neglecta*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brown-headed Cowbird	*Molothrus ater*
Black Rosy Finch	*Leucosticte atrata*
Gray-crowned Rosy Finch	*Leucosticte tephrocoris*
House Sparrow	*Passer domesticus*
Mammals	
Little Brown Bat	*Myotis lucifugus*
Long-eared Myotis	*Myotis evotis*
Long-legged Myotis	*Myotis volans*
Small-footed Myotis	*Myotis ciliolabrum*
Silver-haired Bat	*Lasionycteris noctivagans*
Western Pipistrelle	*Pipistrellus hesperus*
Big Brown Bat	*Eptesicus fuscus*
Townsend's Big-eared Bat	*Plecotus townsendii*
Brazilian Free-tailed Bat	*Tadarida brasiliensis*
Black-tailed Jackrabbit	*Lepus californicus*

TABLE B-1 (continued) General Wildlife Species List Lower Sagebrush/Grassland Steppe	
Mountain Cottontail	*Sylvilagus nuttallii*
Pygmy Rabbit	*Sylvilagus idahoensis*
Townsend's Ground Squirrel	*Spermophilus townsendii*
Belding Ground Squirrel	*Spermophilus beldingi*
Least Chipmunk	*Tamias minimus*
Botta's Pocket Gopher	*Thomomys bottae*
Northern Pocket Gopher	*Thomomys talpoides*
Little Pocket Mouse	*Perognathus longimembris*
Great Basin Pocket Mouse	*Perognathus parvus*
Dark Kangaroo Mouse	*Microdipodops megacephalus*
Ord Kangaroo Rat	*Dipodomys ordii*
Chiesel-toothed Kangaroo Rat	*Dipodomys microps*
Deer Mouse	*Peromyscus maniculatus*
Northern Grasshopper Mouse	*Onychomys leucogaster*
Desert Woodrat	*Neotoma lepida*
Sagebrush Vole	*Lemmiscus curtatus*
House Mouse	*Mus musculus*
Kit Fox	*Vulpes macrotis*
Coyote	*Canis latrans*
Long-tailed Weasel	*Mustela frenata*
Badger	*Taxidea taxus*
Striped Skunk	*Mephitis mephitis*
Mountain Lion	*Felix concolor*
Bobcat	*Lynx rufus*
Mule Deer	*Odocoileus hemionus*
Pronghorn	*Antilocapra americana*
Reptiles	
Western Skink	*Eumeces skiltonianus*
Western Whiptail	*Cnemidophorus tigrus*
Desert Collared Lizard	*Crotaphytus insulris*
Long-nosed Leopard Lizard	*Gambelia wislizenii*
Desert Spiny Lizard	*Sceloporus magister*
Sagebrush Lizard	*Sceloporus graciosus*
Western Fence Lizard	*Sceloporus occcidentalis*
Side-blotched Lizard	*Uta stansburiana*
Desert Horned Lizard	*Phrynosorna platyrhinos*
Short-horned Lizard	*Phrynosorna douglassii*
Long-nosed Snake	*Rhinocheilus lecontei*
Ground Snake	*Sonora semiannulata*
Night Snake	*Hypsiglena torquata*
Gopher Snake	*Pituophis melanoleucus*
Racer	*Coluber constrictor*
Striped Whipsnake	*Masticophis taeniatus*
Western Rattlesnake	*Crotalus viridis*

APPENDIX C

SPECIAL STATUS PLANTS AND ANIMALS

PETE PROJECT AREA

TABLE C-1 Special Status Plants and Animals on Land Administered by Elko BLM	
Common Name	**Scientific Name**
Federal Endangered Species	
None	*None*
Federal Threatened Species	
Bald eagle	*Haliaeetus leucocephalus*
Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
Federal Candidate Species	
Columbia spotted frog	*Rana luteiventris*
State of Nevada Listed Species[1]	
Mammals	
Spotted bat	*Euderma maculatum*
Birds	
Golden eagle	*Aquila chrysaetos*
Burrowing owl	*Athene cunicularia*
Northern goshawk	*Accipiter gentilis*
Ferruginous hawk	*Buteo regalis*
Swainson's hawk	*Buteo swainsoni*
Nevada BLM Sensitive Species	
Mammals	
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Pale Townsend's big-eared bat	*Plecotis townsendii pallescens*
Pacific Townsend's big-eard batq	*Plecotis townsendii townsendii*
Preble's shrew	*Sorex preblei*
Birds	
Western sage grouse	*Centrocercus urophasianus*
Butterflies	
Nevada viceroy	*Limentus archippus lahontani*
Plants	
Lewis buckwheat	*Eriogonum lewisii*

1. Per wording for Table IIa. in BLM Instruction Memorandum No NV-98-013 for Nevada State Protected Animals that meet BLM's 6840 Policy Definition: Species of animals occurring on BLM-managed lands in Nevada that are: (1) "protected" under authority of Nevada Administrative Codes 501.100 – 503.104; (2) also have been determined to meet BLM's policy definition of "listing by a State in a category implying potential endangerment or extinction:" and (3) are not already included as BLM Special Status Species under federally listed, proposed, or candidate species. Nevada BLM policy is to provide these species within the same level of protection as is provided for candidate species in BLM Manual 6840.06C.