U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment
DOI-BLM-NV-S030-2007-0295-EA
March 16, 2009
Revised, June 26, 2009

CR Reward Corporation
Reward Project

APPLICANT

CR Reward Corporation

GENERAL LOCATION

The proposed action is located approximately eight miles south of Beatty, Nevada and three miles east of U.S. Highway 95

BLM CASE FILE SERIAL NUMBER

N-82840

PREPARING OFFICE

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MISSION STATEMENT

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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.

ENVIRONMENTAL ASSESSMENT
DOI-BLM-NV-S030-2007-EA

Reward Project

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1 INTRODUCTION/PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

CR Reward Corporation (CRRC) has submitted a *Plan of Operations and Reclamation Plan Permit Application* (POO) for the proposed Reward Project (Project) to the Southern Nevada District Office (SNDO), Pahrump Field Office (PFO) of the U.S. Bureau of Land Management (BLM) and to the Nevada Division of Environmental Protection (NDEP), Bureau of Mining Regulation and Reclamation (BMRR). The POO was serialized as BLM case file N-82840.

The Project is located in Nye County, approximately eight miles southeast of the town of Beatty, Nevada and three miles east of US Highway 95 (Figure 1-1). CRRC holds claims on an area of approximately 2,006 acres (Figure 1-2), of which 1,786 acres are public lands administered by the PFO, BLM and 220 acres are private lands in all or portions of:

- T12S, R47E, Sections 33, 34, and 35, Mount Diablo Base and Meridian (MDB&M); and
- T13S, R47E, Sections 1, 2, 3, 4, 9, 10, and 11, MDB&M.

The proposed disturbance area necessary to implement the POO consists of 287 (Figure 1-2) acres within a fenced 595-acre desert tortoise exclusion boundary (Project area). This includes the access route and mine facilities, as well as some areas that will remain undisturbed. Of this 287 acres proposed for disturbance, 12.5 acres of pit area would be private land and the remaining disturbance would occur on public lands. The Project area includes portions of:

- T13S, R47E, Sections 2, 3, 9, 10, and 11, MDB&M.

A proposed water supply well and pipeline would be located entirely on public land in portions of:

- T13S, R47E, Sections 9 and 10, MDB&M.

The proposed water supply well and pipeline are subject to approval by the BLM PFO and the Nevada Division of Water Resources (NDWR).

The Reward Project consists of the following components:

- Development of the Reward deposit into an open-pit mine;
- Construction of waste rock dumps associated with the Reward open pits;
- Construction of a heap leach facility, including heap leach pad, solution collection system, process tank and pond, and a carbon adsorption circuit;
- Operation of an ore crushing facility;
- Use of a proposed well and construction of a water pipeline from the well to the Project area;
- Construction of ancillary facilities to support the proposed operation; and
- Construction of onsite mine haulage and onsite mine personnel access roadways.

The mining activities proposed for public lands are subject to review and approval by the BLM pursuant to the Federal Land Policy and Management Act (FLPMA) and subsequent surface management regulations (43 Code of Federal Regulations [CFR], Subpart 3809). The activities, and their approval by the BLM pursuant to FLPMA, constitute a federal action and are thus subject to the National Environmental Policy Act (NEPA). The proposed mining and heap leaching activities, and associated support facilities are similar, in part, to the types of activities described and analyzed in the *Glamis Daisy Mine Reward Project Environmental Assessment – BLM/LV/NV-053-99-059* (BLM 2000).

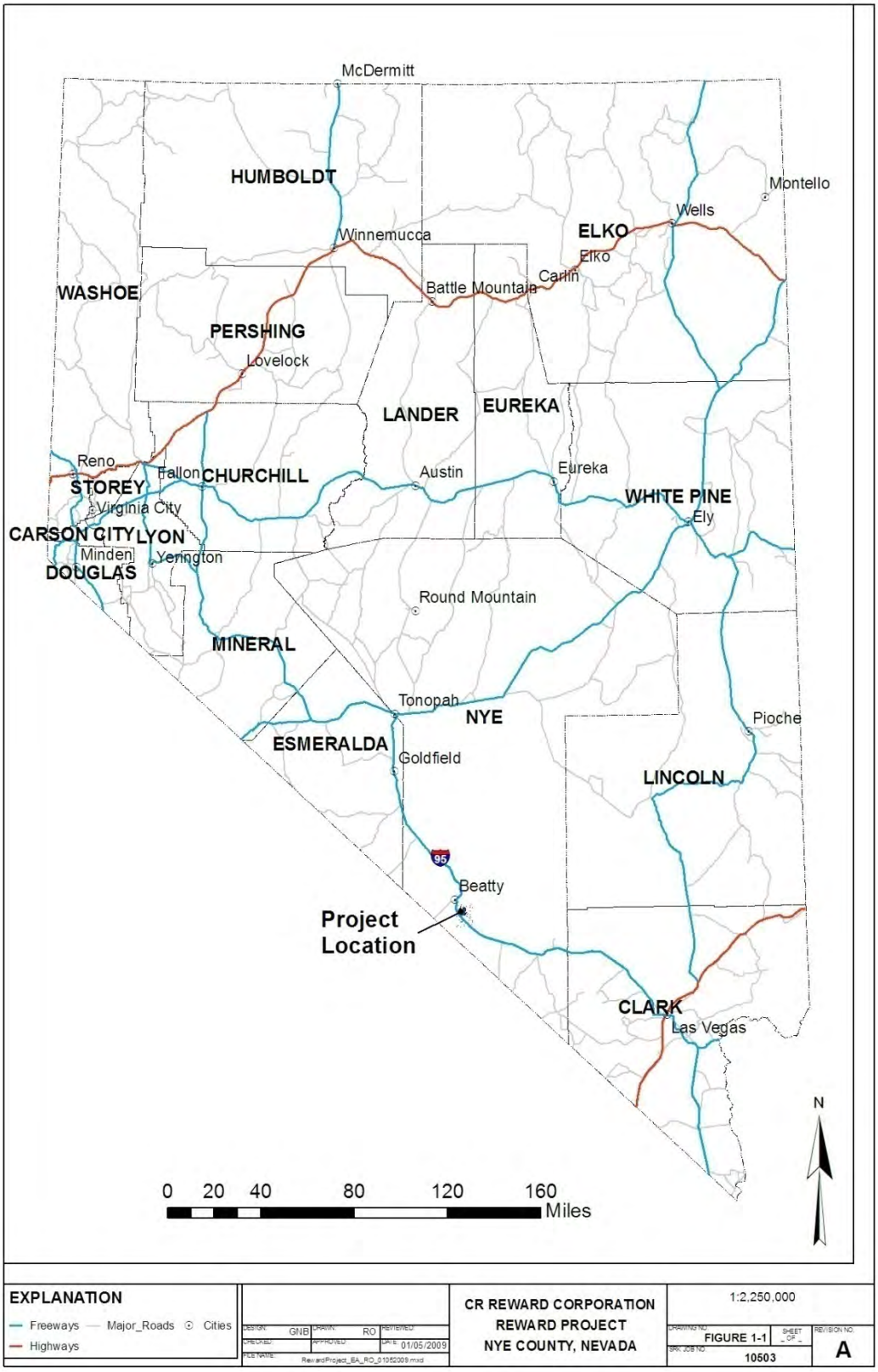


Figure 1 - 1: General Vicinity Map - CR Reward Corporation Reward Project, Nye County, Nevada

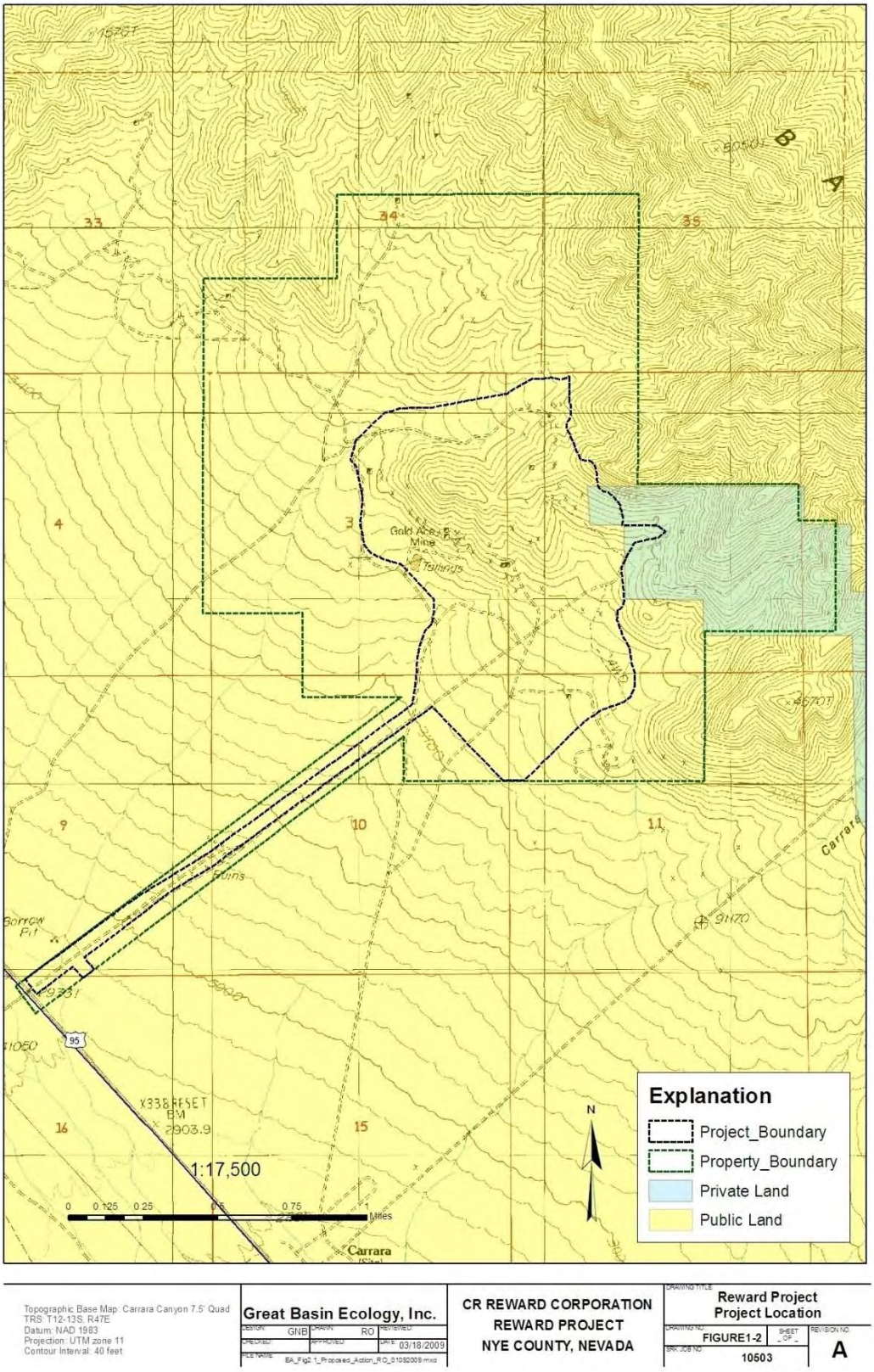


Figure 1 - 2: Reward Project Location, Nye County, Nevada

The BLM has determined that an Environmental Assessment (EA), in accordance with NEPA, must be prepared in order to determine if any additional environmental concerns, interests, resource values, or circumstances in the vicinity of the Project are identified and would be affected by this proposal since the publication of the 2000 EA.

The EA was prepared by the BLM, which is the lead agency with respect to compliance with NEPA and its implementing regulations. The EA considered the quality of the natural environment based on the physical impacts to public lands that may result from implementation of the Reward Project.

1.2 PURPOSE AND NEED

The purpose of the Project is to allow CRRC to develop the mineral resources and to recover gold and silver ore resources identified on mining claims which have been acquired by CRRC under the General Mining Law of 1872. The need is to allow CRRC to meet the prevailing market demand for gold and silver.

1.3 ISSUES AND CONCERNS

Public scoping was conducted in 1998 and 1999 when Glamis Gold, Inc. (Glamis) first proposed to develop the Reward Project. During the initial scoping the following issues and concerns were identified in five letters received by BLM or identified by BLM specialists:

- Threatened, endangered, and sensitive species – including potential habitat for the black woolypod or Funeral Mountain milkvetch (*Astragalus funereus*), cacti, yuccas, and evergreen trees; sensitive habitats such as sand dunes, riparian zones, and others; potential habitat for the desert tortoise (*Gopherus agassizii*);
- Reclamation – use of native and locally-collected or locally-adapted species in the reclamation seed mix;
- Noxious weeds – prevention of the introduction or spread of noxious or injurious weeds or other unwanted exotic species, and development of a noxious weed management plan;
- Cultural resources – inventory and evaluation of cultural resources and potential impacts;
- Bats - disturbance of potential bat habitat at the historic Gold Ace mine workings;
- Desert bighorn sheep (*Ovis canadensis*) - impacts of mining on bighorn sheep and bighorn sheep access to the pit;
- Process solutions – exclusion of wildlife from process solutions; and
- Migratory birds – removal of vegetation during breeding/nesting season of local bird populations.

Following submission by CRRC of the new Reward Project POO to BLM in 2007, scoping was conducted again. Six letters were received, two of which had no comments, but were requesting information. The remaining four letters and BLM specialists identified the following issues[1]:

- Level of NEPA analysis – BLM should prepare an environmental impact statement (EIS);
- Wildlife – potential impacts of mining on wildlife;
- Preparation of a Biological Assessment for formal consultation with U.S. Fish and Wildlife Service (USFWS).

[1] *Issues identified in 2007 that were the same as those identified in the 1998 and 1999 public scoping are not repeated.*

- Groundwater – potential impacts of mining on groundwater and water rights;
- Surface water - potential impacts of mining on surface water and water rights;
- Air Quality – Project needs to comply with NDEP, Bureau of Air Quality regulations;
- Socioeconomics – potential impacts of mining on the local socioeconomic conditions;
- Visual resources – potential impacts of mining to the view shed;
- Amargosa River – potential impacts of mining to the Amargosa River;
- Contamination of groundwater – potential impacts of processing chemicals entering the groundwater aquifer; and
- Ruby Valley Treaty – the Ruby Valley Treaty should be the jurisdiction for the mining activity.

1.4 LAND USE PLAN CONFORMANCE STATEMENT

This EA was written to comply with the BLM regulations for mining activities on public lands under the General Mining Law of 1872, subject to compliance with FLPMA, which is implemented through the surface management regulations (43 CFR 3809) and mandated by the Council of Environmental Quality Regulations (40 CFR 1500-1508) and in accordance with BLM Handbook H-1790-1 and Instruction Memo Washington Office (WO) IM-94-410 regarding the analysis of cumulative impacts.

The Proposed Action and alternatives described in Section 2.0 are in conformance with the Las Vegas Resource Management Plan, approved by the Record of Decision dated October 5, 1998 (BLM 1998), the State of Nevada regulations for reclamation of land subject to mining operations under Nevada Revised Statutes (NRS 445A and 519A), and are consistent with federal, state, and local laws, regulations, and plans. Objectives of the Minerals Management Program are as follows:

1. provide for the orderly exploration and development of valuable minerals on federally owned mineral estate, whether or not the surface estate is in federal ownership, where lands remain open to entry; and
2. use appropriate environmental safeguards to allow for the preservation and enhancement of fragile or unique resources. The Standard Operating Procedures for locatable minerals are included in Appendix A of this EA.

As part of the permitting process, CRRC would submit applications for all other regulatory permits, licenses, and associated approvals necessary to construct and operate the proposed Project. The environmental permits, licenses, and authorizations for the Project are shown in Table 1-1.

Table 1 - 1: CR Reward Corporation, Reward Project Permits and Approvals

Permit/Approval	Approval Date	Granting Agency
Federal Permits		
Plan of Operations N-82840		U.S. Bureau of Land Management
Explosives Permit		U.S. Bureau of Alcohol, Tobacco, and Firearms
EPA ID Number	N/A	U.S. Environmental Protection Agency
Radio Station License		Federal Communications Commission
Nevada State Permits		
Class II Air Quality Permit AP1041-2492	Nov.19, 2008	NV Division of Environmental Protection/ Bureau of Air Quality
Reclamation Permit No.		NV Division of Environmental Protection/ Bureau of Mining Regulation & Reclamation
Water Pollution Control Permit NEV2007101	July 5, 2008	NV Division of Environmental Protection/ Bureau of Mining Regulation & Reclamation
Solid Waste Class III Landfill Waiver		NV Division of Environmental Protection/ Bureau of Solid Waste
General Stormwater Discharge Permit		NV Division of Environmental Protection/ Bureau of Water Pollution Control
Permit to Appropriate Waters #76390	Jan. 9, 2009	NV Division of Water Resources
Permit to Construct Impoundments -		NV Division of Water Resources
Industrial Artificial Pond Permit (heap leach)		NV Department of Wildlife
Liquefied Petroleum Gas License -		NV Board of the Regulation of LPG
Radioactive Material License		NV State Health Division
Septic system permit		NV Division of Environmental Protection
County Permits		
Special Use Permit		Not Applicable

2 PROPOSED ACTION AND ALTERNATIVES

The Reward Project is located on the west flank of the Bare Mountains, approximately eight miles south of the community of Beatty, Nevada at elevations ranging between 2,900 and 4,900 feet above mean sea level (amsl). The current Project area includes approximately 595 acres of public and private lands, of which 287 acres would be disturbed. Access to the site is via U.S. Highway 95 south of Beatty, Nevada approximately eight miles to an unimproved dirt road. The unimproved dirt road extends approximately three miles to the Project site.

2.1 EXISTING OPERATIONS

To date, exploration drilling and associated access roads and drill pads have been the only existing operations at the Project area. Glamis conducted exploration under BLM notice N53-98-010N. There are 13.6 acres of previous disturbance at the Bullmoose Mine, currently known as the Gold Ace Mine. The Bullmoose Mine was discovered in 1913. In 1928, the Bullmoose workings were renamed “Gold Ace” and were again closed in 1929. Later attempts were made to exploit the Gold Ace resources and a minimal amount of ore was processed in a stamp mill at Carrara until 1936. Underground and surface remnants remain on site. The Reward Project reclamation plan does not include the reclamation of any of the surface or underground features associated with Gold Ace.

Notice-level exploration drilling was authorized by the BLM Las Vegas Field Office in 2006 under Serial Number N-81369. CRRC conducted an exploration drilling program through May 2007.

2.2 PROPOSED ACTION

CRRC proposes to develop the site to an open-pit mine with associated limited processing facilities. The following components are included as part of the Proposed Action:

- Development of the Reward and Gold Ace deposits into an open pit mine;
- Construction of waste rock dumps associated with the Reward open pits;
- Construction and operation of an ore crushing facility;
- Construction and operation of a heap leach facility, including heap leach pad, collection system, process tank and pond, and carbon absorption circuit;
- Use of a newly developed well and construction of a water pipeline from the well to the Project area;
- Construction and operation of ancillary facilities to support the proposed operation;
- Construction of mine haulage and public access roadways.

The Proposed Action would directly impact approximately 287 acres within the Project area, 13.6 acres of which have been previously disturbed. The Proposed Action described below is based upon current considerations of practicality, economics, and environmentally acceptable facility operation. Table 2-1 details the proposed surface disturbance for the Project, and the major facilities of the Proposed Action, with their respective projected disturbance footprints illustrated in Figure 2-1.

2.2.1 Open Pits

The Reward Pit would be mined as part of the Proposed Action. The Reward Pit consists of three deposits named after the historic claims: Good Hope, Bullmoose North, and Bullmoose South. The Good Hope deposit is located at the north end of the pit, the Bullmoose North deposit is in the middle of the pit and the Bullmoose South deposit is at the south end of the pit.

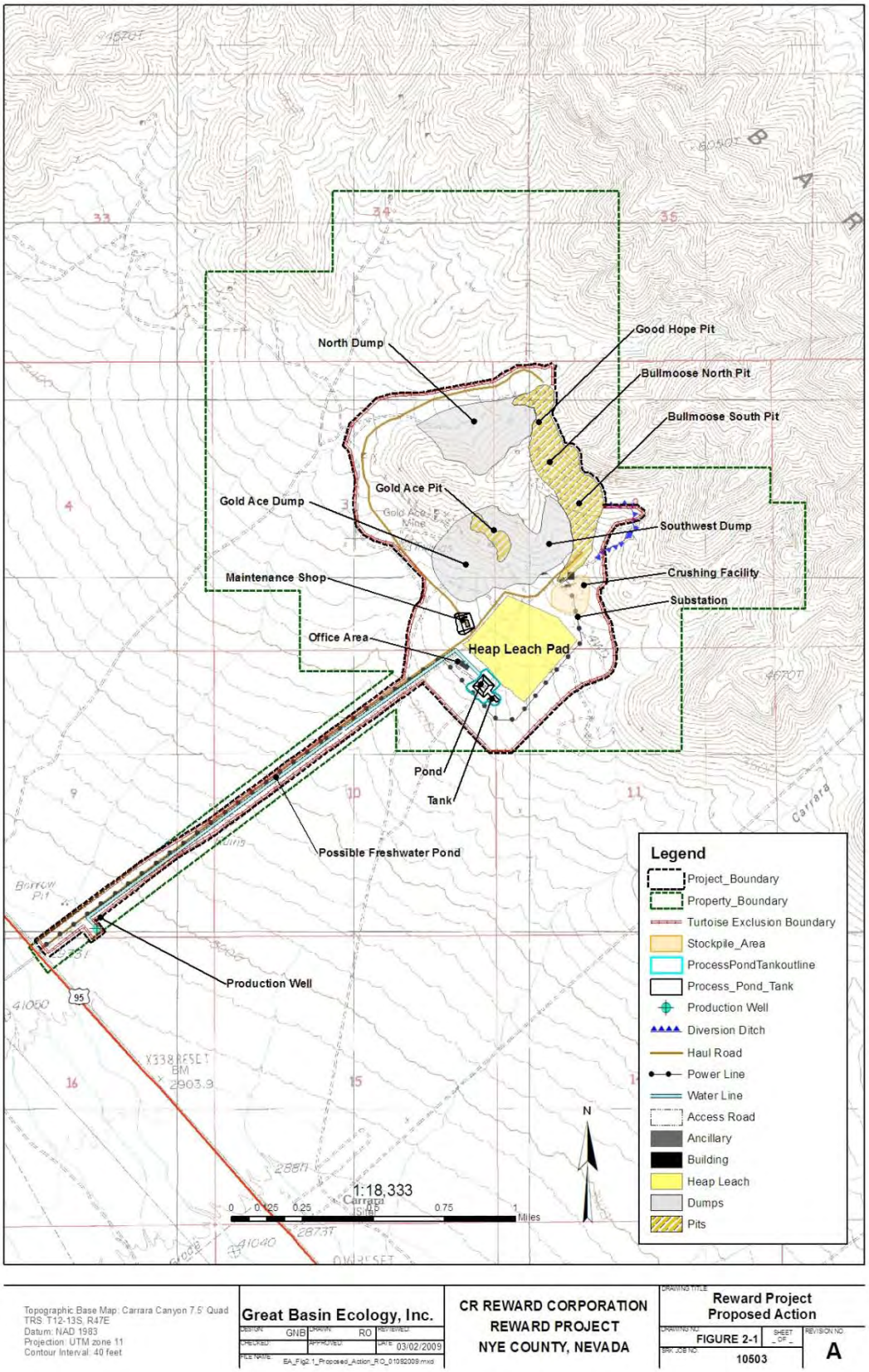


Figure 2 - 1: Reward Project Proposed Action

Table 2 - 1: Proposed Action Disturbance by Component

COMPONENT	PROJECTED SURFACE DISTURBANCE (acres)
Open Pit[1,2]	47.6
Waste Rock Dumps[3]	117.4
Heap Leach Pad	56.1
Tanks	5.5
Ore Crushing Facility	8.9
Ancillary Facilities	23.9
Roads	27.3
Total[4]	286.7

[1] Based on $700/ounce gold.
[2] Includes 1.2 acres exploration disturbance related to CRRC Notice-level exploration drilling in October 2006 and May 2007.
[3] Includes the backfilled Gold Ace pit.
[4] Rayrock/Glamis permitted 214 acres.

The Good Hope, Bullmoose North and Bullmoose South deposits would be interconnected and should be visualized as one contiguous pit with three areas each having slightly different geometry and orientation.

At a $700 per ounce gold price, the proposed Reward open pit would be approximately 3,500 feet in length by 800 feet in width, with a plan view area of approximately 47.6 acres (Figure 2-1). The maximum pit depth of the open pit would be approximately 1,260 feet from the highest elevation along the range front of 4,880 amsl to the ultimate pit floor at approximately 3,600 amsl. However, the general pit depth is likely to range from approximately 300 to 500 feet from the west rim (Figure 2-2).

The proposed new Gold Ace pit is located approximately 1,500 feet west of the Bullmoose South deposit. It is anticipated that the Gold Ace pit would be backfilled with waste rock; therefore the pit disturbance has been assigned to the waste rock dump disturbance category in Table 2-1. This pit would be approximately 5.3 acres in size with an approximate length of 900 feet and width of 300 feet. The Gold Ace Pit would be mined to an elevation of 3,700 feet amsl prior to being backfilled. Waste rock generated in the course of mining the Reward open pit would be placed into the Gold Ace open pit; thereby completely eliminating the Gold Ace open pit by backfilling.

Current minable ore reserves are approximately seven million tons (mt) of oxide ore. Ore mining and processing operations are projected to occur at a nominal rate of one to two million ore tons per year over a mine life of approximately five years. Based on the exploration results and mine plan, approximately 163,500 ounces of gold would be extracted from the gold bearing ore. Silver is also found in small quantities in the oxide ore and it is estimated that approximately 32,700 ounces of silver would also be recovered.

The Reward deposit would be mined on 20-foot benches using conventional open pit mining techniques including drilling, blasting, loading, and hauling. Following blasting, the waste rock would be loaded into haul trucks with a front-end loader and transported to one of the waste rock dump areas. Ore would be transported either directly to the heap leach pad or to the portable crushing facility prior to delivery to the heap leach pad.

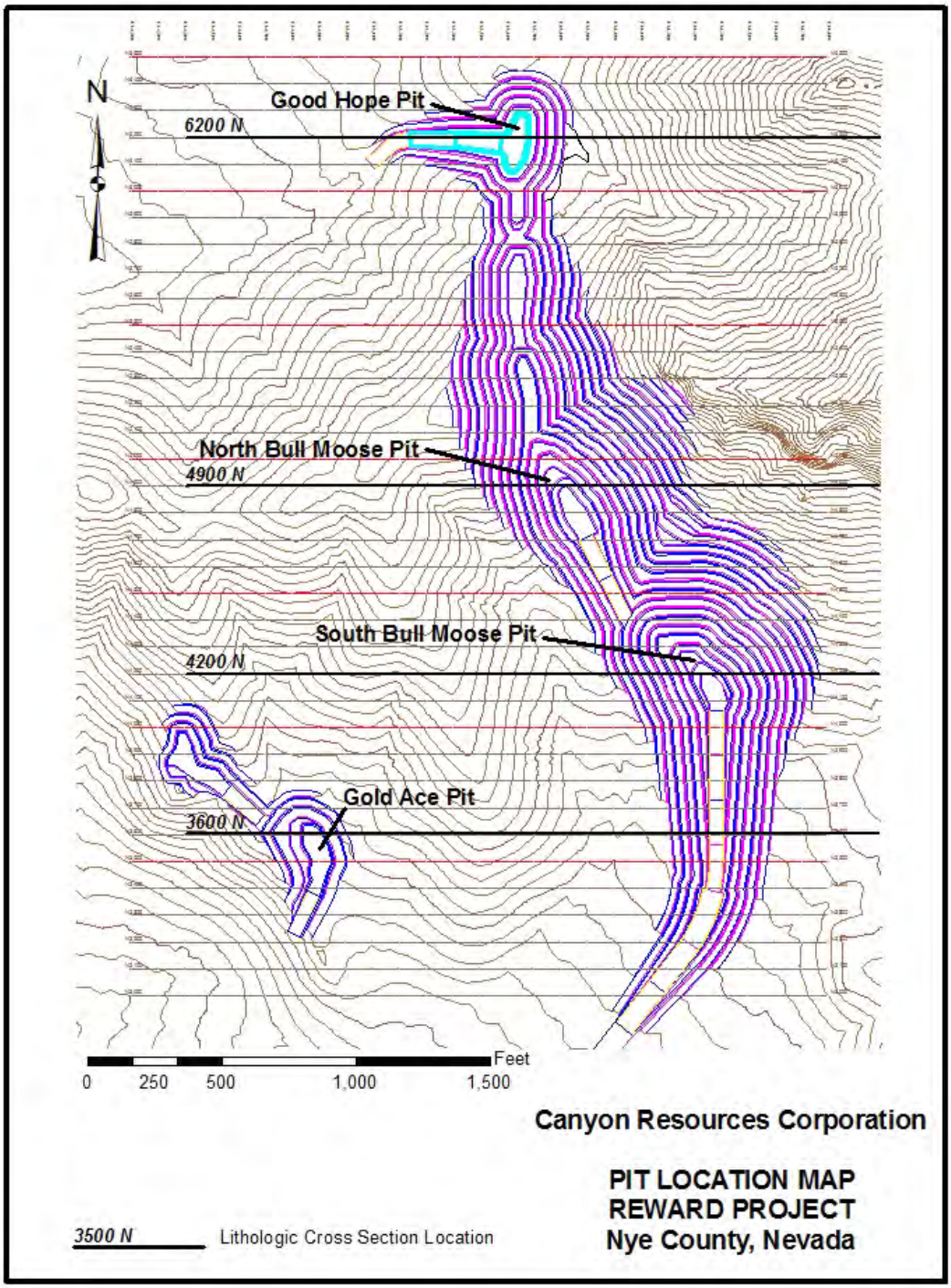


Figure 2 - 2: Cross-Sections of the Reward and Gold Ace Pits

The overall pit slope angle utilized in mine plan development is 50 degrees; however, the pit slope angle would likely range between 38 and 53 degrees with an inter-ramp angle design of 50 degrees. Slopes are designed to establish safe working conditions within the pit and would be visually and mechanically monitored for signs of failure. Working bench heights would be 20 feet. Berms of appropriate height to deter access would be constructed where materials are available for berm construction around the accessible areas of the open pits during the initial stages of mining. Other site berms would be constructed in accordance with United States Department of Labor Mine Safety and Health Administration (MSHA) requirements.

The open pit mining schedule is Projected to require up to two 10-hour shifts per day, four days per week, crushing six days per week, and leaching 24 hours a day seven days a week. This schedule would provide the most effective use of the capital-intensive haulage and excavating equipment. The majority of mining equipment proposed to be used to mine the Reward deposit is listed in Table 2-2, although actual equipment may vary depending on production schedule.

Table 2 - 2: Mining Equipment Proposed to be Used at the Reward Mine

Type of Equipment	Proposed Number
Loader (Cat 992)	2
100-Ton Haul Truck	4
Motor Grader	1
Water Truck	1
Prill and/or ANFO Truck	1
Dozer (Cat D9 or D10)	2
Blast Hole Drill (1 active, 1 secondary)	2

Production blasting would occur during the daytime shift and would occur two to five times per week. The open pit mining schedule would be determined in conjunction with detailed mine planning.

Little or no accumulation of surface water in the open pit is anticipated. Mineralization occurs primarily in the Wood Canyon Formation, which includes fractured quartzite and permeable carbonate rock types that would not be conducive to trapping surface water on the pit bottom. The Proposed Action does not project the need to manage a pit lake due to the fact that net evaporation is greater than precipitation and the groundwater table is several hundred feet below the planned pit floor; therefore, the development of an ephemeral pit lake is not anticipated.

2.2.2 Waste Rock Dumps

Mining throughout the estimated Project life would generate approximately 14 million tons of waste rock. As part of the Proposed Action, up to three waste rock dumps would be constructed to contain waste rock that would be generated from the Reward deposit. These three waste rock dumps, the North Dump, Southwest Dump, and Gold Ace Dump, would total approximately 117 acres and provide sufficient capacity for disposal of waste rock. In addition to the proposed backfilling of the Gold Ace pit with waste rock, CRRC may also use waste material from the Bullmoose South area to partially backfill the Bullmoose North area and waste material from the Bullmoose North area to partially backfill the Good Hope area. Any feasible partial backfill would result in a reduction in size of the surface waste rock dumps; thereby potentially reducing actual

surface disturbance and providing more level post-mining topography to support alternative land uses, while optimizing mining efficiencies.

This option would be implemented if sequencing of mining operations, worker safety, and waste characterization issues can be addressed. Backfilling would not be conducted in the Bullmoose North area during active mining of this portion of the Reward Pit as a matter of mine safety. Waste characterization results would need to demonstrate that the waste does not have potential to degrade Waters of the State.

Waste rock would be end-dumped on the active face of the dump at the material's natural angle of repose (approximately 1.3H:1V). The waste rock dumps would be constructed in lifts not to exceed 100 feet. Final dump slopes would be constructed at an overall slope no steeper than 2.5H:1V>. The waste rock dumps would have ultimate heights varying from approximately 120 to 320 feet.

CRRC would construct diversions around the waste rock dumps to prevent stormwater run-on from contacting the waste rock and stormwater runoff from leaving the immediate vicinity of the waste rock dump. Diverted run-off would enter the natural drainages in such a manner as to prevent excess erosion and changes in character to the existing downstream drainage. If necessary, sedimentation basins or structures (berms) would be constructed to minimize sediment flowing downstream. Additional Best Management Practices (BMPs) such as geotextile and/or hay bale silt fences, rip-rap placement, and vegetative stabilization would be used in conjunction with Nevada Stormwater General Permit and Stormwater Pollution Prevention Plan (SWPPP) requirements.

Waste Rock Characterization

Waste rock from the Reward open pit would be geologically similar to other resources mined at the Glamis Daisy Mine (particularly the West Zone deposit) (BLM 1996, pages 2-6 through 2-8), and would be regularly sampled, characterized, and reported in accordance with the Water Pollution Control Permit (WPCP) issued for the Project by Nevada Bureau of Mining Regulation and Reclamation (BMRR). Generally, all waste materials that would be mined from the Reward deposit are materials that were characterized and evaluated in the Rayrock/Glamis Plan, application and Environmental Assessment (pp. 12-18). During CRRC's mining of the Reward deposit these materials would be routinely characterized as required by the Reward WPCP.

Acid Generation Potential

A geologic and geochemical analysis has been conducted on the Reward open pit waste rock material for acid generation potential (Glamis Plan of Operations N53-98-015P, 1998). All drill holes were logged by Glamis staff geologists and representative samples were obtained from different rock types, composed from several drill holes. SVL Analytical Labs (SVL) of Kellogg, Idaho, conducted the analysis. The 1998 Reports of Analysis from SVL are attached as Appendix B. Acid neutralization potential/acid generating potential by rock types analyzed for the Rayrock/Glamis operation is presented in Table 2-3.

Geochemical analyses were conducted on representative samples collected from CRRC's October exploration drilling program authorized by BLM Notice N-81369 to confirm and augment the 1998 analyses by Glamis. Tabulated results of these analyses are also provided in Appendix B.

Of the 11 samples from the October program analyzed for acid-base accounting, ten samples returned acid-base potential values ranging from 11 tons/1,000 tons (t/kt) $CaCO_3$ to 316 t/kt $CaCO_3$. One sample, of the Juhl Quartzite Member of the Sterling Formation and collected from a five-foot interval located at a depth of 75 ft to 80 ft below ground surface (bgs)

Table 2 - 3: Acid-Base Accounting by Rock Type

Rock Type[1]	ANP[3]	AGP[3,4]	ANP:AGP	Pyritic sulfur (%)	Sulfate (%)	Non-Ext. (%)
Sterling Formation (Quartzite)	1.5	<0.3	5:1	<0.01	<0.01	<0.01
Wood Formation (Silicified, sandy, silty Dolomite)	16.9	<0.3	56:1	<0.01	<0.01	<0.01
Wood Canyon Formation (Quartzite, Phyllite, Schist)	55.6	<0.3	185:1	<0.01	<0.01	<0.01
Wood Canyon Formation (Quartzite)	18.5	<0.3	62:1	<0.01	<0.01	<0.01
Quaternary Alluvium and Colluvium[2]	716.0	<0.3	2,387:1	<0.01	<0.01	<0.01

[1]Source: Glamis Daisy Mine Reward Project Environmental Assessment, March 2000; page 17.
[2]Also represents the Bonanza King and Carrara Carbonate rock types.
[3]ANP = Acid Neutralizing Potential; AGP = Acid Generating Potential; Non-Ext. = Non-extractable sulphur after the nitric wash.
[4]The detection limit is 0.3.

in hole RC-10, returned what could be considered an anomalous neutralizing potential of -0.36 t/kt $CaCO_3$ relative to the reported Total Sulfate and acid potential for this sample compared to the other ten samples. It is noted that the Glamis acid/base accounting results from analyses of the Sterling Formation indicated a lower ANP and ratio of ANP:AGP than analyses from other formations. However, the Glamis ANP:AGP ratio still indicated a ratio greater than 3.0.

The analytical results for the specific sample from the Juhl Quartzite Member of the Sterling Formation could be considered anomalous, even when compared with other analytical results from the Sterling Formation. This interval possibly exhibited some local secondary silicification encapsulating weak mineralization. The Juhl-Wood Canyon contact is mineralized over five to ten feet in some previous Reward Project exploration holes; therefore, the sampled interval in CRRC hole RC-10 may have intercepted the contact.

In summary, the associated acid neutralization potential/acid generation potential (ANP/AGP) ratios of waste rock range from 5:1 to 2,387:1. NDEP guidelines suggest that any material with an ANP/AGP ratio of less than 1.2:1 may be potentially acid generating. Therefore, acid generation from the Reward deposit waste rock is unlikely. Two rock formations, the Bonanza King and Carrara, were not sampled due to their relatively small quantity (3.6 percent of the total volume of waste rock to be mined), and because they would be mined and deposited concurrently with other acid neutralizing rock types. The overlying alluvium and colluvium are composed mainly of limestone, marble, and dolomite fragments transported by gravity from the Carrara Formation and Bonanza King dolomite exposures in the bluff lying immediately east of the ore zone. Therefore, additional characterization of this rock type was considered duplicative. Figures 2-3, 2-4, 2-5, and 2-6 summarize the Reward open pit waste rock by geologic unit, with accompanying geologic cross sections.

Meteoric Water Mobility Considerations

In addition to conducting the acid generation potential tests described above, the Rayrock/Glamis samples were also analyzed using the Meteoric Water Mobility Procedure (MWMP) (see SVL Reports of Analysis in Appendix B). Test results are summarized in Table 2-4. Analytical results of the MWMP leachate showed that pH, a secondary drinking water standard, ranged from 8.86 to 9.05, exceeding the standard of 6.5 to 8.5 in three of the five samples.

The Project is located in a low precipitation/high evaporation area. Therefore, drainage from infiltrating meteoric water through the waste rock dumps is not projected to occur. No

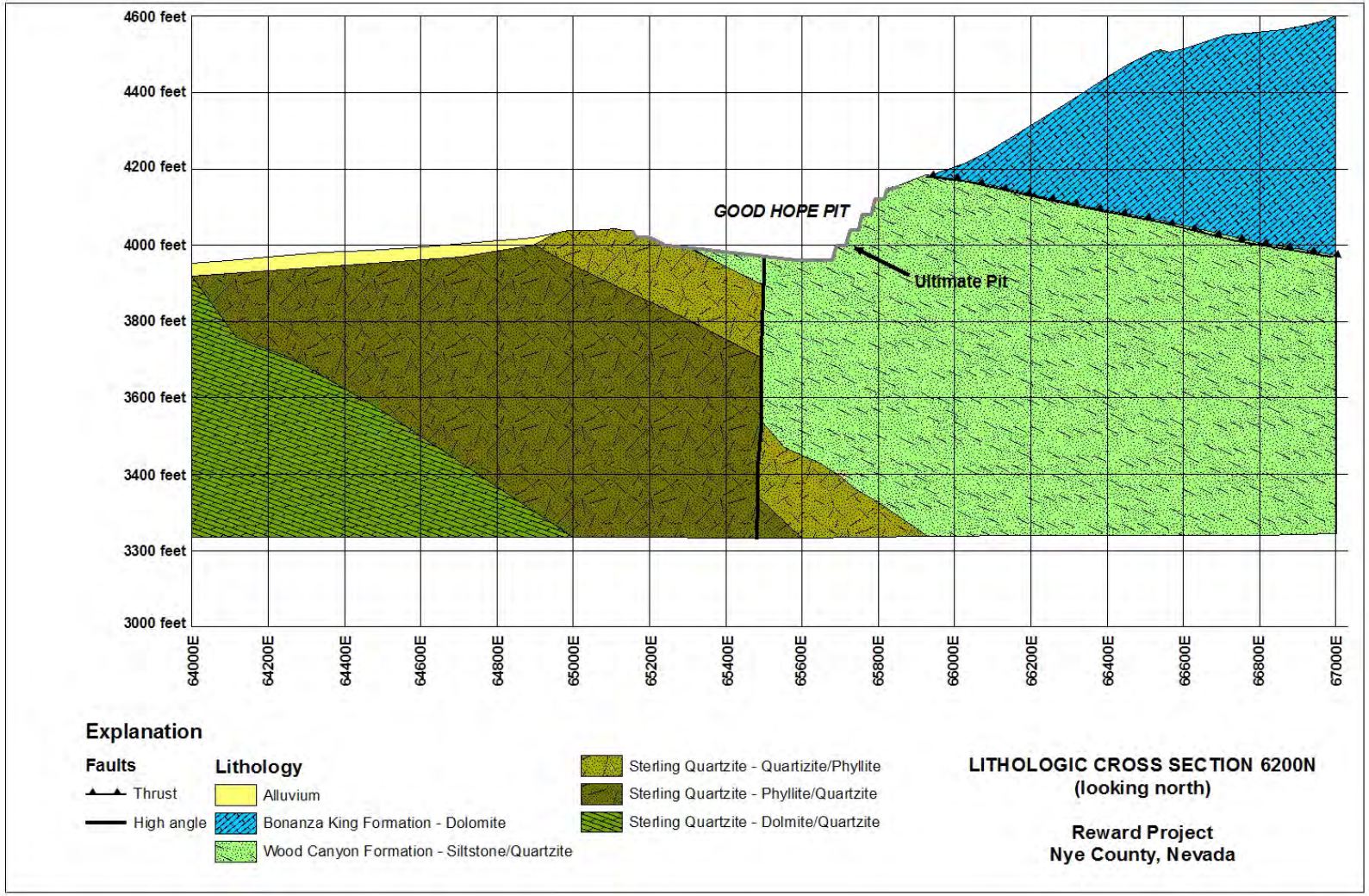


Figure 2 - 3: Lithology of the Good Hope Pit

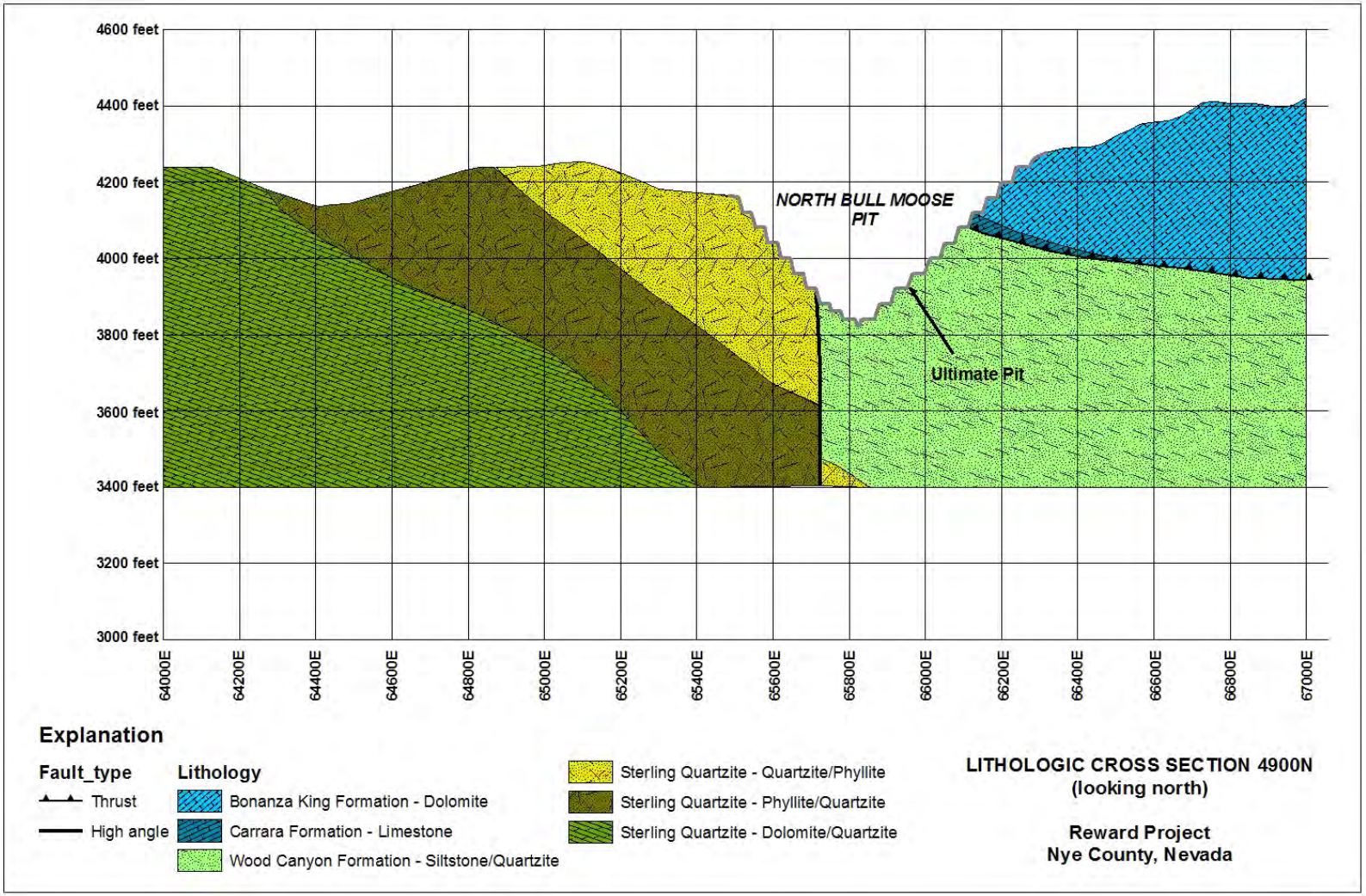


Figure 2 - 4: Lithology of the Bullmoose North Pit

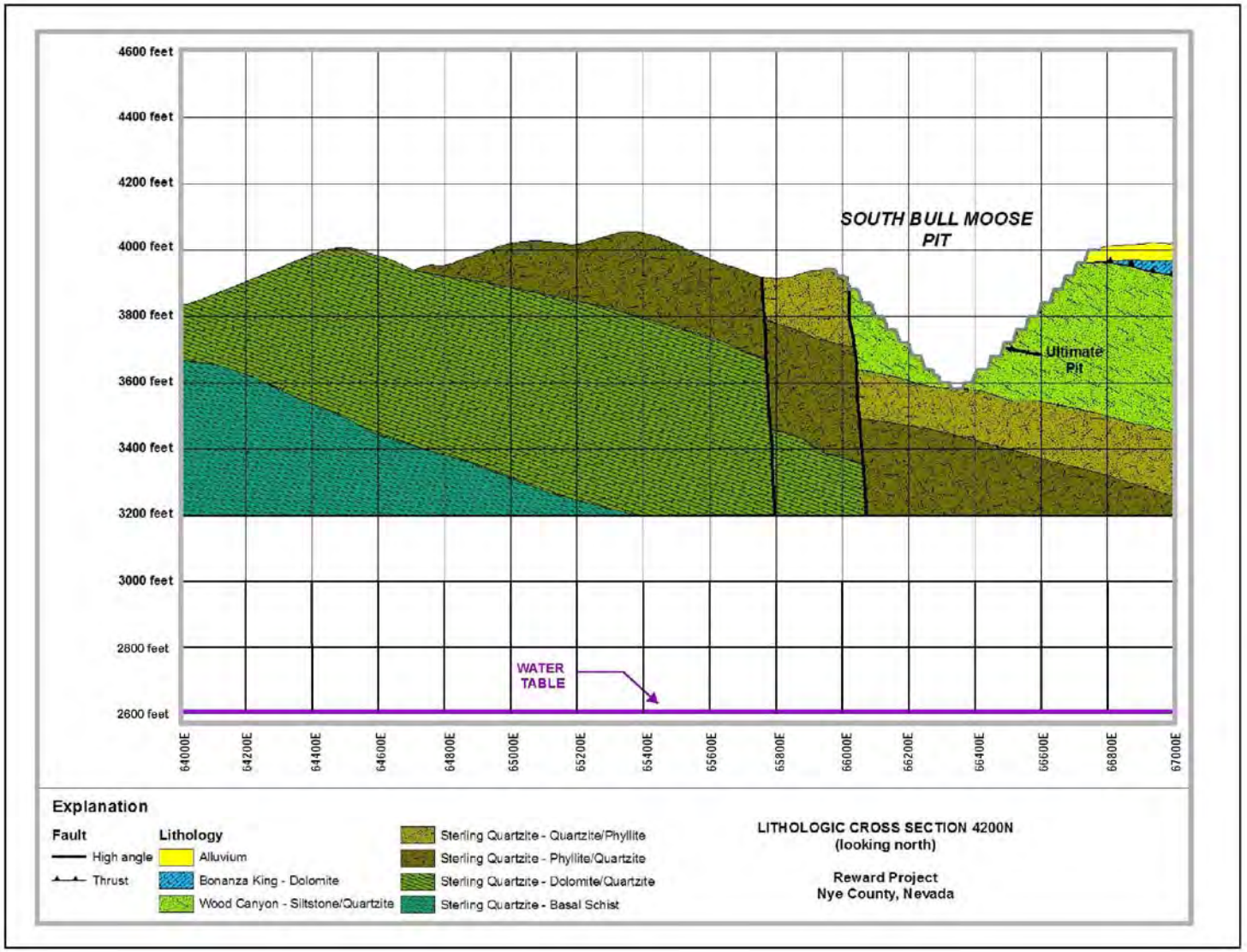


Figure 2 - 5: Lithology of the Bullmoose South Pit

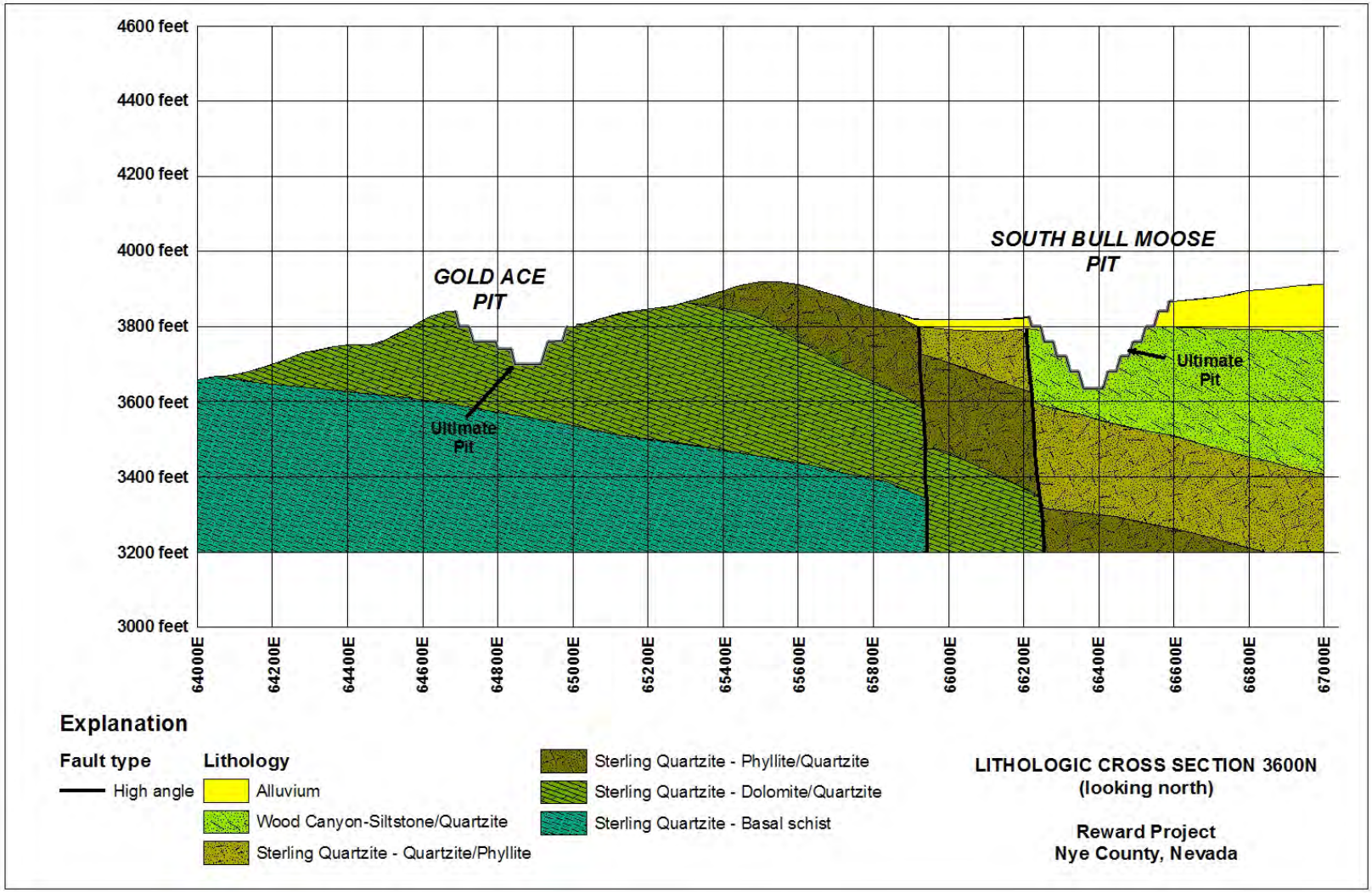


Figure 2 - 6: Lithology of the Gold Ace Pit

Table 2 - 4: Meteoric Water Mobility Analysis by Rock Type

Rock Type	SVL Test #	Sampled Interval(s) (Feet)	Constituents Exceeding Drinking Water Std.
Sterling Formation (Quartzite)	177080	0	None
Wood Canyon Formation (Silicified, sandy, silty Dolomite)	177084	15-35	pH; 9.05
Wood Canyon Formation (Quartzite, Phyllite, Schist)	177082	30-50	None
Wood Canyon Formation (Quartzite)	177081	50-70	pH; 8.86
Quaternary Alluvium and Colluvium[1]	177083	10-30	pH; 8.99

[1]Also represents the Bonanza King and Carrara Carbonate rock types.

groundwater or springs have been identified during reconnaissance and condemnation drilling in the entire Project area.

It is anticipated that only oxidized rock material would be mined and that oxidized material would be placed on the waste rock dumps. However, if unoxidized waste rock material is encountered, the unoxidized rock would be blended with oxidized materials unless the volume of unoxidized material is sufficient to segregate. The unoxidized material would then be isolated and covered with suitable material to reduce the potential for acid rock drainage (ARD). Material placed in waste rock dumps would be sampled and managed pursuant to the WPCP requirements.

2.2.3 Ore Crushing Facilities

The proposed mined oxide heap leach ore would be hauled directly from the open pit to the Reward crushing facility (Figure 2-1) for material size classification, then placed on a conveyor system for pad delivery. The ore crusher facilities would include the crusher equipment, conveyors, and ore storage area and would occupy approximately three acres.

The facility would be equipped with a jaw crushing, secondary cone crushing unit, and tertiary cone crushing unit with appropriate feeding, conveying, and stockpiling components. The crusher would be operated at approximately 350 tons per hour to meet the ore production requirement of approximately 31,000 tons per week, or 1.6 million tons per year.

2.2.4 Ore Processing Facilities

The approximately seven million tons of ore would be hauled from the open pits and delivered, via haul trucks, to either the heap leach facility as run-of-mine ore or the ore crushing facility for crushing prior to delivery to the heap leach facility. The ore processing facilities would occupy approximately 56 acres (52.8 acres for the heap leach pad and 3.5 acres for the pond and tanks).

<u>Heap Leach Pad</u>

The heap leach pad would be located southwest of the open pits and waste rock dumps (Figure 2-1) at approximate elevation 3,550 feet to 3,750 feet amsl and may be constructed in multiple phases to accommodate the ore production schedule. The pad would have a minimum design capacity of approximately seven million tons based on an average bulk density of 20 cubic feet per ton. The pad and associated solution collection ditches, pond and tanks are anticipated to

encompass a total area of approximately 56 acres. The process complex is located immediately downstream of the pad (Figure 2-1).

The pad would be graded to generally follow the natural topography. This would be accomplished by smoothing the natural ground, cutting ridges and filling swales to provide a suitable foundation for the liner system. Additional fill materials may be required in some areas of the pad; however, the fill depth is not anticipated to exceed 15 feet. Fill materials would be obtained from borrow sources within the pad.

The lower portion of the heap leach pad would slope approximately five percent with the overall leach pad slope averaging approximately 11 percent. Select sections of the upper portion of the heap leach pad would slope from 10 to 20 percent.

The leach pad liner system is designed with a 60-mil linear low density polyethylene (LLDPE) geomembrane overlying a compacted 12-inch layer of low permeability (1 $x10^{-6}$ cm/sec) soil liner. The soil liner materials would be constructed from imported fine-grained soils to create a suitable soil liner that meets the permeability requirements. Vadose zone monitoring beneath the composite liner would be implemented to ensure the ability to provide early detection in the event of any leakage of process fluid from the heap leach liner system. Vadose zone monitoring is discussed further below.

The liner would be overlain with a minimum two-foot cover layer of crushed ore or drainage gravel to assist in solution collection and protect the liner during ore placement. The lower berm would be notched at the exit point of the headers and lined so that the primary liner is not penetrated by the piping.

The heap would be stacked in 15 to 30 foot lifts to an ultimate height of 170 feet. Each lift would be placed by conveyor stacking the ore at its angle of repose; each subsequent lift would be setback to create a 2.5H:1V intermediate slope for each group of three lifts.

Initial stacking would always be staged to begin from the lowest elevation on the leach pad. The first lift would be set back 30 feet from the outside berm and several intermediate benches would be widened to obtain an overall maximum slope for the entire heap at closure conditions no steeper than 2.5H:1V (from the crest of the ore to the inside crest of the downstream berm). The benching would minimize the amount of grading necessary to recontour the heap at the time of Project closure.

Solution collection would be controlled by construction of external diversion berms, and installation of lateral and header collection piping. To control and monitor flow, two separate headers, eight to 12 inches in diameter, would transport solution from various sections of the pad, as defined by natural drainage features within the area. Each header would be perforated within its specific collection section, and then would continue to through non-perforated pipe to the tank within a lined solution ditch to provide secondary containment.

The laterals would be four-inch diameter perforated, corrugated, HDPE and would be placed at a minimum spacing of 150 feet on center. The spacing of the laterals could be varied depending on the slope of the pad and would be finalized in the engineering design report to be submitted as required in the WPCP application. The pipes would be placed at approximately a 45-degree angle to the contours of the pad and at a minimum of one percent slope. The headers and laterals were sized using a solution application rate of 0.004 gallons per minute per square foot (gpm/sf). Each pipe would gravity flow at approximately 50 percent of its maximum capacity during normal operations.

Solution Management

Leaching would be accomplished with a dilute sodium cyanide solution ranging in concentration from 0.10 to 1.0 pounds of NaCN per ton of solution. Caustic soda or lime would be added to maintain the pH of the solution between 10.5 and 11.0. Leach solution would be applied to the heap by means of a watering system capable of flow rates of 700 to 1,000 gallons per minute.

Solution would be routed to a central collection location and would exit the pad to a tank through a series of solid HDPE pipes routed through a lined berm such that flow is maintained in a closed system to minimize evaporation and promote conservation of the water resource.

The solution would then be routed to a tank which contains the carbon circuit. The carbon would be transferred into appropriate containers, sampled, and transported to CRRC's CR Briggs Corporation Briggs Mine or similar facility for stripping, refining, and carbon reactivation. The solution would then go to the barren tank. The process circuit is designed using conventional cyanide heap leaching technology (Figure 2-7). The process fluid storage tanks would be used as an alternative to the conventional double pond system; thereby reducing the potential area of disturbance for process pond construction and reducing evaporation of process fluid.

The pregnant and barren solution tank-storage complex for the heap leach pad would be designed with minimum combined capacity to contain normal process volumes plus storm water. This system would consist of the tanks and an event pond. The solution storage would have the capacity for operational and emergency storage for the 25-yr, 24-hr storm event on new lined areas, plus draindown over a 24-hour period assuming full flow at 1,000 gpm from the leach pad, and would have capacity to withstand incremental solution from a 100-yr, 24-hr storm event acting on the event pond area only (over the 25-yr, 24-hr storm) with an allowance for the "wet month" based on historic precipitation data.

The event pond operational side slopes would be 3H:1V. The event pond would be double lined with a primary and secondary 60 mil HDPE liner. The lowermost liner of the pond would be founded on six inches of fine-grained liner bedding soil (i.e., compacted clay). Solution tanks would be founded over six inches of compacted clay overlain by a single 60-mil HDPE liner with 36 inches of soil/aggregate cover.

The tank containment areas would be constructed with a capacity to contain at a minimum 110 percent of the volume of the largest tank plus emergency storage for a 25-yr, 24-hr storm event.

Vadose Zone Monitoring

The unsaturated, or vadose, zone beneath the heap leach pad and solution management area (ponds and/or tanks) would be monitored by a series of porous cup or pan lysimeters or equivalent devices in order to monitor any potential impacts to the vadose zone resulting from accidental release of process fluid. The details of the monitoring system are included in the WPCP.

Processing

The process column operational range is from 700 gpm to 1,000 gpm. Initial operation of the heap leach pad may occur at a rate of approximately 700 gpm. Further loading of the heap leach pad, or construction of the heap leach pad in a phased manner, would lead to full capacity production at a rate of approximately 1,000 gpm.

Pregnant solution (solution containing precious metals) would be pumped through a carbon column where the precious metals are adsorbed onto activated carbon. The recovery plant would include a five-stage carbon column adsorption tower that would be sized to handle 7.5 tons of carbon at a flow rate of 700 to 1,000 gallons per minute.

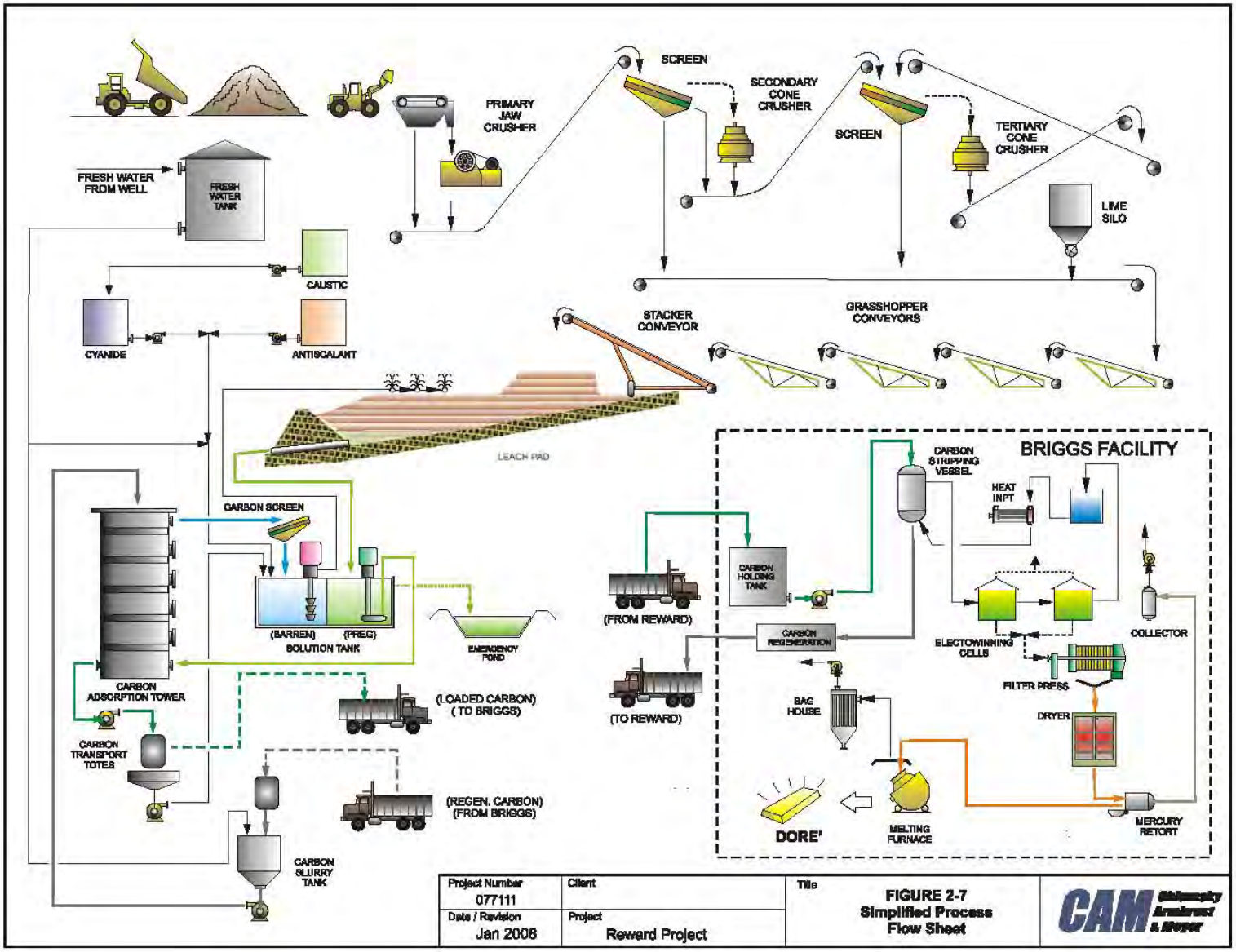


Figure 2 - 7: Simplified Process Flow Chart

Once the carbon is loaded with gold and silver, only the loaded carbon (carbon with gold and silver) would be transferred into appropriate containers, sampled, and transported to CRRC's CR Briggs Corporation Briggs Mine or similar facility for stripping, refining, and carbon reactivation. Delivery to the Briggs Mine or similar facility would be by contained and secured transport. Reactivated carbon would be trucked back to the Reward Project to continue the process. Any necessary permits for transportation of the carbon would be acquired prior to transportation of loaded carbon. No toxic or hazardous materials would be transported as part of this process.

2.2.5 Ancillary Facilities

Ancillary facilities, including mine site services facilities, growth media stockpiles and berms, water source and supply, electric power, structures, drainage control, fuel storage facilities, fencing, communications, public access road realignment, sanitary and solid waste disposal, and petroleum-contaminated soil management, are projected to disturb approximately 24 acres.

Mine Site Service Facilities

Mine site service facilities for the Project would consist of a mine maintenance trailer (supply and parts), a mobile-equipment maintenance facility, up to three explosive magazines, two prill bins, mine office trailers and miscellaneous storage containers. The mine maintenance trailer, mobile-equipment maintenance facility, and miscellaneous storage containers would be located between the heap leach pad and the Gold Ace Dump (Figure 2-1). The mine office trailers would be located adjacent to the heap leach pad. The explosives magazines and prill bins would be located within the vicinity of the open pit. Tentative locations are displayed on Figure 2-1. A single-lane access road would be constructed to the powder magazine within a secured area of the Project site, isolated from the public. Magazines would be secured in accordance with federal, state, and local regulations.

The mine office trailers would be located at the intersection of the public access road and the access road to the process facilities.

The mobile-equipment maintenance facility would consist of a concrete pad with poles supporting a metal shell covering or providing other weather protection from the prevailing wind direction. The proposed small facility would have up to two equipment maintenance bays and would incorporate no overhead crane. Onsite mobile crane(s) would be used in place of a fixed overhead crane in the maintenance facility.

Growth Media Stockpiles and Berms

Onsite growth media affected by site construction would be salvaged to the extent feasible and as required by the Reclamation Permit. The available quantity of growth media that may be salvaged from the Project area, based on site inspection, is expected to be less than the potential growth media occurrences illustrated on Natural Resource Conservation Service (NRCS) soil survey data.

Growth media would either be placed directly on prepared slopes or would be stored for future use in intermediate berms or stockpiles. A berm is a small stockpile which is normally dozed in place by a track dozer. Berms are usually built with the growth media material salvaged from within footprints of the open pit(s) and waste rock dump areas. The berms would have a height of approximately 3.5 feet maximum at the normal angle of repose, 1.3H:1V (horizontal to vertical). They may or may not be seeded depending on the projected life of storage.

Berms around waste rock dumps would be constructed of growth media from within the dump site. Clearing of growth media material would be conducted in phases to minimize disturbance

at any one time. The growth media would be dozed down below the projected toe of the recontoured slope. Once the terraced waste rock is placed and recontoured to approximately 2.5H:1V, the material would be dozed or hauled back up onto the slope.

This sequence would continue throughout the construction of the waste rock dump starting with the lowest terrace first and progressing uphill. If necessary, growth media would be stockpiled on the open terraces and pushed down to assure a uniform thickness. Occasionally, intermediate terraces may need to be constructed for access purposes.

When the quantity of growth media is too great to be utilized as berms, it would be hauled to stockpile areas or to areas ready for concurrent reclamation. If required, growth media stockpiles would not exceed 20 feet in height to minimize wind erosion and compaction. Stockpile side slopes would not exceed 1.3H:1V to reduce the potential for water erosion and permit the establishment of protective vegetation cover. Berms and stockpiles Projected to be in existence for six months or longer would be seeded with an interim seed mix to prevent loss of material from erosion and to prevent invasion of undesirable species; especially noxious weed species. Growth media stockpiles would be designated as such by signage to ensure proper identification of the material contained within the pile, as well as to guard against unauthorized removal of the material from the site.

Pit safety berms approximately five feet high would be constructed where possible, and where material is present to facilitate berm construction, around the accessible areas of the open pits during the initial stages of mining for safety reasons. Other site berms, particularly those on each side of large mobile equipment haul roads, would be constructed in accordance with MSHA requirements.

Water Source and Supply

An existing water right owned by Barrick has been leased by CRRC. The State Engineer's office has granted a Change in Point of Diversion, Place and Manner of Use for Barrick's well EW-3. Water would be provided from a newly constructed well located at T13S, R47E, Section 9, SW¼, SE¼, on the east side of US Highway 95. A pipeline would be constructed from the designated production well to the mine site. No new disturbance is associated with this pipeline as it would be within a roadway borrow ditch which has been previously disturbed.

The water supply pipeline would be placed along the south side of the access road. The pipeline would convey fresh water to onsite freshwater storage facilities which may include storage tanks and/or ponds. Water stored in the onsite tanks and/or ponds would then be conveyed in pipes or by mobile water trucks (in the case of haul road dust suppression) to such water consumptive uses as heap leach process make-up, crusher dust suppression, and fugitive dust suppression.

CRRC would permit a non-community non-transient public water system as required by the NDEP Bureau of Safe Drinking Water. Bottled drinking water would be purchased from and delivered to the mine site by a commercial vendor.

Electric Power

Electric power for offices, crusher, and mine support systems would be provided by a power line extending from the existing power line located adjacent to U.S. Highway 95 (Figure 2-1). A 1,500 kVa power line would be constructed adjacent to the Project access route to the mine office area and to the ore crusher and process facilities area. There would be a set of four transformers, one each at the pumping station, heap leach facility, maintenance shop, and crushing facility. Emergency power would be supplied by generators located within the crusher facility area.

Structures

All structures on the Project site, except the mobile-equipment maintenance facility, would be portable and will be delivered and set up on site. The following structures are proposed for location onsite to support the proposed operation:

- two 20-foot by 60-foot office trailers;
- three 20-foot by 40-foot storage trailers for supplies and maintenance; and
- mobile-equipment maintenance facility (as described above).

The carbon tank associated with the heap leach pad would require a foundation.

Drainage Control

A stormwater run-on control system would be constructed to efficiently route stormwater run-on around the waste rock dumps, crushing facility, heap leach facility, and office complexes. Surface water resulting from precipitation events would be diverted from entering any open pits, to the best extent possible, via a stormwater run-on control system. This system would reduce erosion that may be caused by concentrated flows generated by activities at the site. It is possible that small quantities of surface water could potentially enter the pits as stormwater run-off from haul roads which enter the open pits.

Channels would be sized to transport surface waters either to natural drainage ways or to sedimentation structures (berms, ponds, etc). Sediment collection ponds/basins, if required, would be constructed to control the volume of eroded soil which could be transported off-site into natural drainage ways within the area.

Little or no accumulation of surface water in the mine pits is anticipated as a consequence of the geologic formation characteristics since the water table may be as deep as approximately 1,000 feet below the ultimate pit floor.

Fuel Storage

Fuel for the diesel-powered mobile equipment, backup electric power generators, and for gasoline-powered small vehicles and equipment would be stored onsite in above-ground steel storage tanks. The above-ground steel storage tanks would be placed within containment of sufficient height to contain the volume of 110 percent of the largest tank.

Fencing

The crushing facility/storage area and the heap leach pad area would be enclosed by a three-strand barbed wire fence to exclude burros from the operating areas. The event pond and process facilities would be enclosed by a chain link fence to prevent burros and wildlife from accessing the ponds. Wire gates would then be installed as needed in low-traffic areas and metal hinged gates would be constructed in high traffic areas. The 595-acre Project area would be fenced and fitted with desert tortoise exclusionary fencing, as required by Biological Opinion File No. 84320-2008-F-0293.

Communications

Licensed portable FM radios and CBs would be used for site communications. Off-site communications would be established through the use of commercial telephone, cellular phone, and/or satellite phone systems as appropriate.

Public Access Road

The Reward deposit lies on the far northeast end of the existing public access road to an unnamed canyon due north of Carrara Canyon. A combination of new road construction and improvements to existing roadways would be completed to accommodate mine traffic and public vehicles up to the active mine site. Signs, fencing, and gates may be used to separate public traffic from the mine equipment. Approximately 11 acres of surface disturbance would be associated with maintaining public access. Public access would require check-in at the mine office near the heap leach facility. This is to provide safety precautions for the public due to mine blasting operations and ore and waste haulage traffic that would be encountered beyond the heap leach facility. Public access to public lands located south and north of the Reward Project would remain available via existing roadways located south and north of the mine property.

Sanitary and Solid Waste Disposal

All sanitary waste would be disposed of on-site, using permitted septic tank/leach field facilities and/or portable units maintained by a licensed commercial vendor. No landfill facility is currently available in Beatty. Therefore, solid waste would be disposed of in a permitted Class III waivered mine site landfill facility, as allowed by federal, state, and local regulations. The Class III landfill would be located within one or all waste rock dumps.

Petroleum-Contaminated Soil Management

Any petroleum-contaminated soil (PCS) materials due to accidental releases from equipment or storage tanks would be managed offsite at the permitted commercial US Ecology waste facility located approximately five miles southwest of the Reward Project.

2.2.6 Roads

Mine haul roads would be approximately 100 feet wide with maximum gradients of ten percent. The haulage surface would be approximately 70 feet wide, plus 30 feet for safety berms and drainage ditches. Approximately 27 acres of disturbance would be associated with the haul roads, of which 4.2 acres have been previously disturbed.

Dust on the haul roads would be minimized by applying water and/or applying approved chemical binders such as magnesium-chloride or lignin sulfanate. Haul roads with similar construction would also be built within the pits. In-pit haul roads would be of sufficient width to allow haul vehicles to pass abreast. Daily road maintenance would be completed on all haul roads as needed.

Public access to the mine facilities would be restricted or prevented by a combination of signs, fences, and gates. Public access to public lands located south and north of the Reward Project would remain available via existing roadways located south and north of the mine property.

2.2.7 Work Force

Construction Work Force

CRRC anticipates that the construction period would be of minimum duration. Road construction, crushing plant erection, and ancillary facility construction and/or installation would be minimal and intermittent. Employees would be recruited from the local (Beatty, Amargosa, Pahrump and Nye County, and Las Vegas/Clark County) work force, and augmented by the CR Briggs workforce.

Operating Work Force

Employees for the operating work force of the Reward Project would be recruited from the local (Beatty, Amargosa, Pahrump and Nye County, and Las Vegas/Clark County) work force, and augmented by the CR Briggs workforce. CRRC plans on sharing engineering and administrative function personnel with the CRRC-owned CR Briggs Corporation, located approximately 110 miles southwest of the Reward Project, as needed. Other operations management and supervision may also be shared with CR Briggs Corporation. Approximately 70 to 80 individuals would be employed at the mine.

2.2.8 Reclamation

CRRC proposes to disturb up to 287 acres within the Reward Project boundary. Most of the disturbance would result from the development of the Good Hope, Bullmoose North, Bullmoose South, and Gold Ace pits and the construction of two waste dumps. Haul roads, ore processing facilities, and public access would also require surface disturbance. Reclamation would occur concurrently, when practicable, and post-mining, following procedures utilized by CRRC at the CR Briggs Corporation Briggs Mine.

All disturbances associated with the Reward Project would be considered active and would be reclaimed by CRRC. Historical disturbances found in the Reward Project area consist of mine workings and more recently created exploration disturbance. Exploration roads used as part of the Reward Project would be reclaimed.

CRRC intends to practice concurrent reclamation during the life of the mine, as practicable. Reclamation of mining and exploration operations may include: recontouring, ripping, stabilization, seedbed preparation; growth media application; and revegetation.

In general, the Reclamation Plan includes:

- measures for the protection of wildlife, burros, and the public;
- measures to minimize erosion and mass failure potential;
- regrading of selected cut and fill slopes; and
- where feasible, measures to allow for the resumption of pre-mining land uses.

The reclamation procedures proposed for the Reward Project incorporate six basic components:

- establishment of stable topographic surface and drainage conditions that are compatible with the surrounding landscape and serve to control erosion;
- establishment of soil conditions most conducive to establishment of a stable plant community through stripping, stockpiling, and reapplication of suitable growth medium;
- revegetation of disturbed areas to establish a long-term productive biotic community compatible with proposed post-mining land uses;
- consideration of public safety through stabilization, removal, berming and/or fencing of structures or land forms that could constitute a public hazard;
- minimize the outward regrading or reshaping of slopes to reduce further impacts to undisturbed wildlife habitat; and
- consideration of the long-term visual character of the reclaimed area.

Mineral exploration, wildlife habitat, and recreation are the pre-mining land uses within the Project area. The long-term goal of the reclamation plan is to restore the productivity of the disturbed sites to allow for these same uses post-mining.

Not all disturbed areas can be revegetated within a reasonable time period. Surface mine pits in arid climates are an example of such conditions. Steep walls and slopes are a residual of mining which cannot be revegetated but can provide habitat for raptors, bats, passerine bird species, and desert bighorn sheep.

Contouring and Shaping

Slopes would be shaped for reclamation. Depending on the type of material, the potential to erode, and the practical considerations of the mining process, overall slope grades would range from near vertical (e.g., pit high walls) to near horizontal (e.g., road surfaces). After closure, the pit high walls would be left in a stable configuration, subject to natural processes. The proposed post-mining topography is depicted in Figure 2-8. Waste dumps would be recontoured to an overall slope averaging 2.5H:1V wherever practicable.

Final grading of cut and fill and of waste rock dumps would create undulating land forms that are stable, do not allow for pooling or ponding, and blend with the surrounding undisturbed topography. Final grading would minimize erosion potential and additional surface disturbance, and would facilitate the establishment of post-mining vegetation. Straight lines would be altered to provide contours which are visually and functionally compatible with the surrounding terrain.

Seedbed Preparation

Seedbed preparation would take place after grading, stabilization, and growth media placement. Procedures used in seedbed preparation would include:

- loosening of compacted surfaces, and ripping and/or disking or other mechanical manipulation to leave the surfaces in a rough condition;
- use of tillage implements, as needed, for all areas to be reclaimed that can safely be worked by surface equipment to create a friable surface with favorable bulk density; and
- possible application of soil amendments, followed by surface scarification (e.g., disking, raking or treating) to incorporate the amendments into the growth media. The prepared surfaces would be seeded using a broadcast seeder and/or rangeland drill, depending on the working area and steepness of slope.

Seeding/Planting

Revegetation activities would be performed in the fall through late winter to take advantage of winter moisture. For broadcast applications, the seeder would be followed by dragging a light chain or other means to provide some soil cover of the seed. When possible, a range land drill would be used for more effective seeding. The rocky terrain and soil materials in the Project area may dictate use of broadcast seeding.

Cacti removed from the footprint of planned facilities prior to construction would be transplanted onto reclaimed surfaces as appropriate (see Section 2.2.9).

Seed Mixtures and Application Rates

CRRC would attempt, through the selection and development of adequate seed mixtures of grasses, forbs, and shrubs, to re-establish native species on site. The proposed reclamation seed mix is presented in Table 2-5. This seed mix has been used with success at the CR Briggs

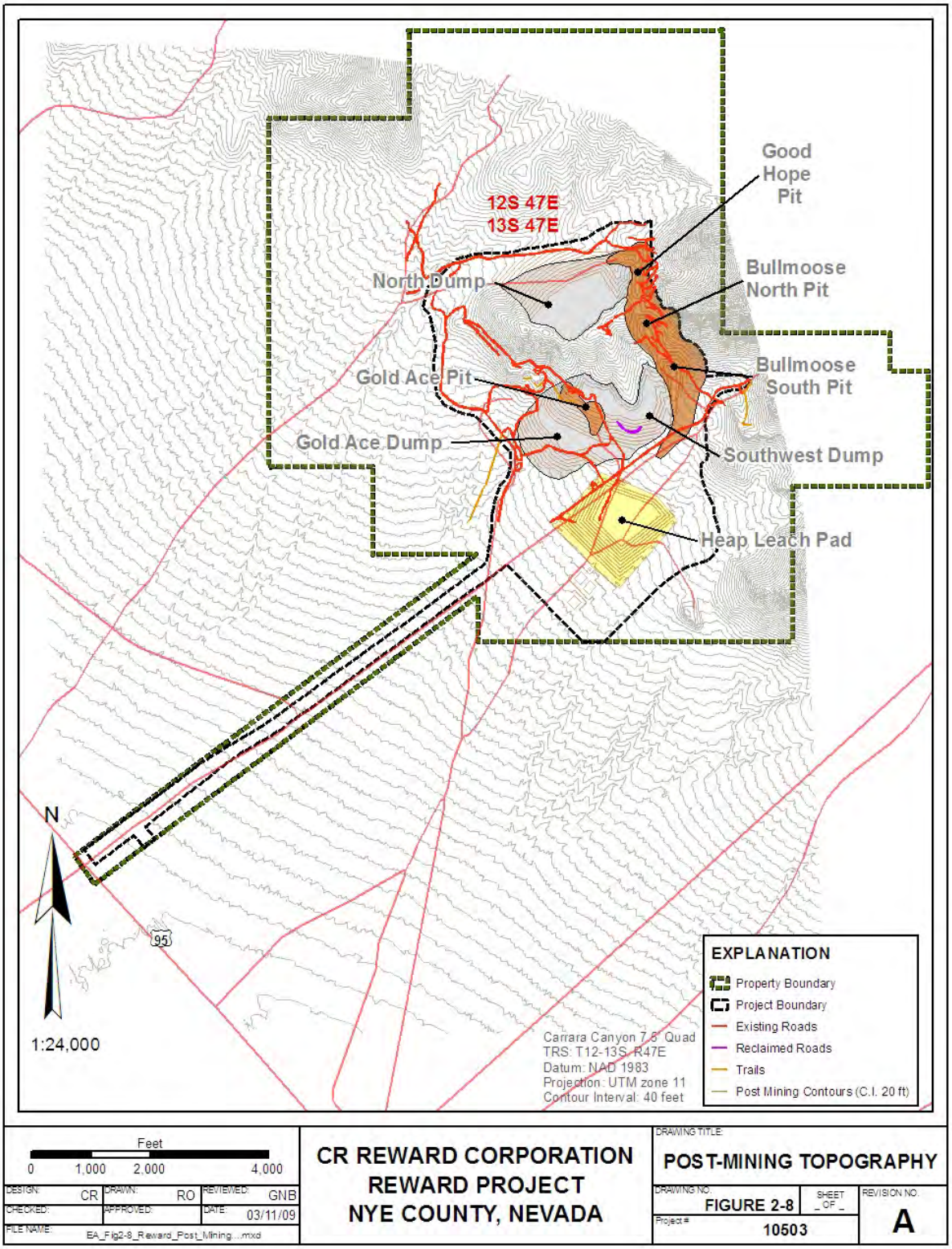


Figure 2 - 8: Reward Mine Post-Mining Topography

Table 2 - 5: Proposed Reclamation Seed Mix

Common Name	Scientific Name	PLS** /lb.	PLS lbs /ac*	PLS /ft^2	% PLS by Seeds /ft^2	Comment
White Bur-sage (Burrobush)	*Ambrosia dumosa*	85,000	1.00	2.0	4.5	Natural invader
Desert holly saltbush	*Atriplex hymenelytra*	52,000	2.00	2.4	5.5	Good performer
Shadscale	*Atriplex confertifolia*	64,900	1.00	1.5	3.4	Long-term survival
Quailbush	*Atriplex lentiformis*	500,000	0.50	5.7	13.2	Fair performer
Desert Spinach Saltbush	*Atriplex polycarpa*	800,000	0.50	9.2	21.1	Fair performer
California Buckwheat	*Eriogonum fasciculatum*	450,000	1.00	10.3	23.7	Fair performer
Bladderpod	*Cleome isomeris*	4,000	1.00	0.1	0.2	Should perform
Winterfat	*Ceratoides lanata*	56,700	0.50	0.7	1.5	Fair performer
Brittlebush	*Encelia farinosa*	175,000	0.50	2.0	4.6	Natural invader
Nevada Mormon Tea	*Ephedra nevadensis*	19,900	0.50	0.2	0.5	Modest performer
Creosote	*Larrea tridentata*	80,000	2.00	3.7	8.4	Use scarified seed
Desert marigold	*Baileya multiradiata*	1,060,000	0.10	2.4	5.6	Should perform
Desert Indianwheat	*Plantago insularis*	325,000	0.30	2.2	5.1	Natural invader
Desert globemallow	*Sphaeralcea ambigua*	500,000	0.10	2.3	2.6	Should perform
		Total	**11.00**	**43.6**	**99.9%**	

** The **11.0** lb/ac mix is designed for drill seeding. When broadcast and harrow or hydroseeding methods are used, the rate should be increased 1.5 times. When hydroseeding methods are to be used the seed must be placed prior to mulching.*
***** PLS = Pure Live Seed***

Mine and the two sites are similar. Actual species used at the time of reclamation would depend on availability. The immediate result may not be a diverse plant community due to short term weather conditions which limit moisture. If monoculture plant communities develop, CRRC would address diversity on a property-wide basis. The seed mixture may be adjusted to develop different plant communities in successive seedings. Proper range management, after meeting BLM's and NDEP's successful reclamation standards, is an integral part of the long term diversity development.

Reclamation Schedule

Reclamation would be initiated when individual mine components are no longer required for mine operations or when site closure begins. Removal of facilities, rough grading, and scarifying activities may occur at any time during the Project. Concurrent reclamation of select disturbed areas may occur as soon as practicable. When ore reserves are exhausted, mining operations would stop.

Leaching operations would stop after the limit of economic recovery of precious metals is reached. It is foreseeable that heap leach activities would remain active after mining activities have stopped, due to the length of time required to complete leach cycles. It is currently estimated that residual leaching may occur for two years following placement of the last ore mined.

Slope Stability and Technical Criteria

The Reward Project would generally create three types of slopes: pit walls, waste rock stockpiles, and spent heap leach slopes.

The overall pit slope angle utilized in mine plan development is 45 degrees; however, the pit slope angle would likely range between 38 and 53 degrees with an inter-ramp angle design of 50 degrees, depending on the specific location within the pit. The specific technical criteria used in the determination of the final gradient and stability of pit walls are pit economics; rock type and strength; geologic structure; groundwater, if present in any quantity (unlikely) that may affect stability; and the results of previous construction at other local mines with similar geologic characteristics (Daisy Gold Mine and Barrick Bullfrog).

The waste rock dump designs employ several proven techniques to ensure that reclaimed slopes would be stable during construction, operation, and final reclamation. Since depths to groundwater in the locations of the waste rock dumps are in excess of 1,500 feet, groundwater is not expected to be a factor in slope stability.

An analysis of the final configuration of the waste rock dump embankments indicates that each of the waste rock dumps would be stable under static and seismic (i.e. pseudo-static) conditions (Golder Associates 2006).

An analysis of the heap leach stability was based on stability profiles on planned operation slopes of 2.5H:1V and for reclaimed slopes of 3H:1V, and for an ultimate stacking height of 170 feet (Golder 2007a and 2007b). The stability analyses considered both static and earthquake-induced (i.e., pseudo-static) stress conditions. Static loading considers only the stress of the ore stacked at the designed ore slopes, whereas the seismic loading conditions consider the peak acceleration created by the earthquake and also account for the strength reduction in a fine-grained material (i.e. ore) that is susceptible to strain softening resulting from a buildup in pore water pressures.

The stability analyses indicated that the Reward Mine Leach Pad would be stable under the designed grading plan and liner systems, when stacked to a maximum heap height of 170 feet, and at ore side slopes no steeper than 2.5H:1V for operating conditions and 3H:1V for closure conditions (Golder 2007a and 2007b).

Open-Pit Reclamation

Upon completion of active mining and waste rock disposal, reclamation in these areas would commence. A primary goal for reclamation is to ensure long-term stability of the final configurations. The pits would be constructed with safety benches and engineered with calculated safety factors to ensure slope stability during the operational life of each pit. Pit walls would gradually ravel and slough over time to the natural angle of repose for the individual rock types. No recontouring is planned in the pit areas. The perimeter berms, constructed during initial pit development would be left for public safety. Warning signs would be placed around the pits.

Haul roads in and around the pit area would be ripped; road cut and fill slopes would be recontoured where feasible. Road beds would be ripped and/or scarified to prepare a seedbed or a surface for application of growth media. The area would be seeded with the appropriate seed mixture.

Waste Rock Stockpile Reclamation

Upon final mine closure, the waste rock stockpiles would be regraded to achieve an approximate 2.5:H:1V maximum overall slope where practicable, recontoured, and crowned to prevent water ponding.

Waste rock stockpile perimeters would be irregular to allow blending with the existing topography and to break up the long, linear features. Large boulders would be left on the ridges

or benches to provide wildlife habitat. All flat benches or other areas of the stockpile with recontoured slopes gradual enough to allow access by heavy machinery would be ripped and/or scarified to produce a rough surface for anchoring of reapplied growth media. Available growth media from the stockpiles would be distributed on the tops and portions of the stockpile slopes. All disturbed areas would be seeded with the approved seed mixture.

Heap Leach Pad Reclamation

Permanent closure of the heap leach facilities would require assurance of the chemical stability of the spent ore and that the long-term status of the facilities would not degrade ground waters of the State. Prior to initiating final permanent closure and reclamation of the heap leach facilities, CRRC would submit for NDEP approval a final permanent closure plan. This plan would identify those measures that would assure chemical stability and non-degradation of groundwater. Measures may include:

- establishing vegetative cover sufficient to enhance the evapotranspiration of meteoric waters (precipitation) on the heap; thereby inhibiting the infiltration of those meteoric waters through the heap;
- placing additional cover material on the spent ore to enhance the vegetative success and further inhibit infiltration of meteoric waters (precipitation) through the heap;
- recirculating heap draindown fluid to lower the concentration of pH, WAD cyanide and other constituents in the fluid;
- filtration of the recirculated fluid via carbon adsorption to further reduce constituent levels; and
- use of the event pond to create an evapotranspiration basin (ET Cell) to contain and evaporate the long-term heap draindown.

An ET Cell would be constructed using the existing lined event pond which would then have several feet of gravel placed on the liner. The gravel would be overlain by growth media to support vegetation establishment. The heap draindown fluid would flow by gravity to a manifold located in the ET Cell. The manifold would partition the incoming flow to the various areas of the ET Cell via underground perforated pipe to facilitate “irrigation” of the ET Cell. The ET Cell would be seeded with appropriate species that would facilitate the transpiration of the fluid. The species selected for use in the ET Cell would depend on the volume of fluid to be processed each year. This could include wetland species during the initial phase followed by deep-rooted grasses and shrubs as the rate of inflow decreases.

The ET Cell would also be sized to accommodate the effluent resulting from a 100-year, 24-hour event to ensure containment of the heap leach draindown. As a contingency measure, the ET Cell would have an overflow pipe that would convey excess fluid to an evaporation pond. This would be a lined pond with several feet of gravel material over the liner. This pond would be sized to accommodate at least one-half of the volume of the ET Cell.

The use of an ET Cell would require approximately one to two years of residual gold production after mining is completed. During this time, cyanide would continue to be applied for approximately one year, followed by application of fresh water for approximately one year, and then at least one year of evaporation of the draindown. The evaporation would continue until the long-term draindown flow rate is within the capacity of the ET Cell to process with a margin for storm water events. When this rate is achieved, the event/evaporation pond would be converted to the ET Cell.

Potential active recirculation of heap fluid may be alternated with “resting” periods of up to several months duration, during which the heap would be allowed to dry. The resting period would allow process fluid time to migrate from interstitial cavities which may not “see” active leach solution. The recirculation and resting would continue for the minimum duration necessary until the heap is determined to be chemically stable.

Recirculated fluid percolating through the heap and collected in the existing heap fluid collection system would continue to be routed to the lined solution ponds and/or tanks and either recirculated again onto the heap or allowed to evaporate. During active closure operations, all monitoring would continue in accordance with WPCP requirements related to specific stations, parameters, and frequencies.

The application rate of recirculated fluid to the heaps would be determined by the permeability of the heap, by field experience gained during leaching operations, and from the results of any column tests or other such closure studies that may be performed during the later stages of Project operation. It is anticipated that the application rate of recirculated fluid would probably be similar to the leaching rate until such time that the closure goal is achieved.

The existing lined event pond would be partially filled with coarse material overlain with a layer of large material. The coarse material would have sufficient pore volume to contain the long-term drain down and the large material would allow evaporation of the solution and prevent wildlife access to any short-term surface water.

Criteria for confirming the chemical stability of the spent ore would be identified in the final permanent closure plan and developed in accordance with NDEP requirements. Achievement of stability criteria would include a demonstration that meteoric waters contacting the stabilized spent ore have no potential to degrade the waters of the state.

Samples of the recirculated fluid draining from the heap would be collected and tested on a periodic basis as required by the WPCP. As presented in the final permanent closure plan, at a point when the chemistry of the recirculated fluid is determined to be chemically stable relative to closure goals, recirculation of fluid would cease and the heap would be allowed to drain. Representative samples of spent heap ore would be collected and subjected to NDEP meteoric water mobility tests. If the results of these tests indicate that the spent heap does not have the potential to degrade the waters of the state as a result of infiltration under normal meteoric conditions, the heap would be considered chemically stable. If the tests indicate that contaminants may be mobilized in sufficient quantity to degrade the waters of the state, recirculation of fluid may continue, or, upon consultation with NDEP, other methods would be considered to stabilize the spent ore. If certain requirements are not achievable, CRRC may request a specific waiver from those requirements as provided for in Nevada regulations.

Reclamation of the stabilized heap would be conducted as follows:

- The side slopes of the heap would be regraded to a maximum slope of 3H:1V where practicable and as described previously. A dozer would be used to rework the crest of the spent ore so that the overall landform of the heap blends with the natural topography but overall resloping may not be required. Similar dozing patterns, such as those planned, have been successfully used at other heap leach operations in the desert physiography. This approach, referred to as micro-contouring, creates micro-basins and results in features designed to trap moisture and seeds. The initial contouring is designed to provide stable surfaces and to control and minimize erosion. Revegetation would provide longer-term stability, reduce visual contrasts and provide wildlife habitat.

- Perimeter berms and solution conveyance ditches would be left intact and covered during regrading. The liner and drain pipes would be left under the stabilized heap. The heap would be resurfaced with available growth media and seeded to revegetate species that are specified in the approved reclamation seed mix.
- All chemicals and reagents stored onsite would be removed, along with their empty containers, and disposed of consistent with appropriate state and federal regulations.
- All surface piping and exposed conduit would be removed and disposed of properly.
- Buried piping and conduit would be capped to prevent wildlife access.
- Following achievement of vegetative success criteria on revegetated areas, fencing would be removed.
- Roads would be recontoured and ripped and/or scarified, as necessary, and seeded. Water bars may be incorporated if slopes on the reclaimed roads are determined to have the potential to cause undue erosion.
- All buildings, tanks and equipment associated with the leaching facility would be removed and cement foundations broken up and buried in place.
- All other disturbed areas would be regraded, surfaced with growth media if available and necessary, and seeded with the approved revegetation seed mix.

A component of the final permanent closure plan would be a prediction of the potential for, and rate of, long-term flow of meteoric waters percolating through the spent ore and collected in the existing process fluid collection system. Despite the Reward Project's location in an arid environment with high evaporation and evapotranspiration, a conservative closure strategy should account for the potential for some element of long-term flow from the spent ore; particularly during periods of excess precipitation onto the heap. The final permanent closure plan would include plans for the continued collection and management of potential long-term flow. The current plan is for collection of the low volume/low flow draindown fluid in existing pond for evapotranspiration through vegetation growing in media placed into the lined pond during closure and reclamation of the ponds (i.e., construction of an ET cell).

Any long-term fluid management system is required to be approved by NDEP and BLM and would ensure non-degradation of ground waters of the State.

The heap leach process would utilize steel tanks to contain heap solution, and one event pond would be constructed. After heap residual leaching and draindown is completed, residual water would be allowed to evaporate and sludge remaining after evacuation of all process fluids from any steel process fluid storage tanks would be removed. If the sludge is determined to have a gold value, it would be processed off-site. If the sludge is determined not to have gold value, it would be removed and placed on the heap leach pad, to remain in containment.

Empty steel process fluid tanks would be triple rinsed with fresh water. The tanks would then be removed from the site and transported to another CRRC operation, offered for sale as surplus equipment, or the steel would be recycled. If CRRC has no other use for the tanks and market conditions do not warrant economic realization from sale or recycling of the tanks, they would then be cut into pieces and disposed of in the onsite Class III waivered landfill. Containment areas within which the tanks were located would also be rinsed and concrete containment walls and/or synthetic liner containment pieces would be broken and cut up and buried in place or in the onsite landfill.

Netting, if used, would be placed on the synthetic process area liners. The synthetic liners would then be folded and buried in place. Regrading of the process areas would be conducted to

achieve contours which blend with the surrounding topography and to re-establish the approximate pre-mining drainage. Grading would also be conducted in a manner that prevents water ponding.

Road Reclamation

The main haul roads, access roads, and all remaining exploration roads and compacted surfaces, with the exception of designated county roads, would be ripped, scarified, and revegetated. Roads would be contoured as near as possible to blend with the surrounding terrain. Any water diversion structures would be removed and the natural drainage patterns restored. Water bars or other structures may be left in place to reduce any undue erosion. Public access roads would be left, or returned to the pre-mining condition and location if practicable, given the post-mining topography. Road improvements, such as road widening to accommodate two-way traffic, would be reclaimed, while some portions of the road realignment would not be reclaimed, but the public access would remain.

Sediment Control

Measures employed at the mine site to control sediment movement would consist of:

- diversion ditches in areas with major surface disturbance;
- surface compaction and binding agents on selected disturbed areas and roadways;
- construction of water bars or berms in areas exposed to runoff;
- ripping of the ground surface along the natural contour;
- periodic inspection and maintenance of runoff controls; and
- concurrent reclamation of disturbed areas, where feasible, and minimization of surface disturbance

In addition to these items, silt fences may also be installed along appropriate locations at the base of the regraded stockpile slopes to contain sediment until vegetation is established.

Post-Reclamation Maintenance and Monitoring

When reclaimed areas meet the specified bond release criteria, no further post-reclamation maintenance would take place. Reclaimed areas which have not met specified bond release criteria would be maintained to achieve the following goals:

- prevention of undue degradation of the disturbed lands;
- determination of revegetation success; and
- achievement of total bond release.

Remedial measures would be taken to accomplish the stated revegetation goals. Where required, the following corrective actions would be taken to prevent undue erosion, sedimentation, soil destabilization and unsatisfactory vegetation growth:

- construction and maintenance of surface diversion facilities;
- construction and maintenance of rock filters;
- application of soil stabilizers;
- additional shaping and recontouring; and
- additional revegetation operations.

CRRC would monitor warning signs, erosion control structures, and fences placed around those portions of the Project area while those areas remain under bond stipulations. CRRC would continue monitoring until reclamation goals and requirements have been achieved, and the bond is released.

2.2.9 Environmental Protection Measures (Mitigation)

Measures to be taken to prevent unnecessary or undue degradation over the life of the Project will consist of the following:

- Surface disturbance would be limited to those areas that are essential for completion of the mine plan;
- Standard, acceptable mining practices would be used to construct and operate all the mining and processing components. Practices employed to avoid degradation include dust suppression, controlled blasting, drainage and sediment controls, growth media salvage and concurrent reclamation; and
- Whenever possible, tracked exploration drill rigs would be used to minimize disturbance.

CRRC intends to practice concurrent reclamation as reasonably as practicable within the economic and technical constraints dictated by current circumstances and as mining and exploration plans allow.

Partial Backfill

As an option, CRRC may use waste material from active mine pits to completely or partially backfill exhausted mine pit areas. The complete or partial backfill would allow for a reduction in size of the waste rock dumps, thereby keeping surface disturbance to a minimum while optimizing mining efficiencies.

Hazardous Materials Protection Measures

Any wastes generated which are classified as hazardous would be managed in accordance with Nevada State and Federal Environmental Protection Agency (USEPA) regulations and guidelines. CRRC would dispose of materials as follows:

- spent heaps would be closed in accordance with NDEP regulations requiring chemical stability, demonstration of non-degradation of ground waters of the State, and post-closure monitoring and reporting to verify closure; and
- process chemicals and petroleum products not used or salvaged would be removed and disposed of according to NDEP and USEPA regulations.

Sediment Control

No perennial surface waters are present within the Reward Project area. Measures that would be employed by CRRC to reduce sediment runoff include:

- construction of diversion ditches around major areas of surface disturbance;
- use of soil compaction and binding agents on selected disturbed areas as necessary;
- construction of water bars or small berms in area exposed to runoff (pits, roads, site facilities) where practicable;
- periodic inspection and maintenance of run-off controls during life-of-mine;
- concurrent reclamation of disturbed areas where possible; and
- minimization of disturbance.

Diversion ditches would be revegetated and left in place to control sediment. Additional sediment control structures may be necessary near non-vegetated surface disturbances. These would include:

- silt fences;
- straw bale windrows;
- rip-rap; and

- other stormwater BMPs.

Non-degradation of Waters of the State and United States

Mining operations would proceed in accordance with BLM, NDEP and, if applicable, U.S. Army Corps of Engineers (USACOE), regulations, policies, and guidelines for such activities.

Soils, Vegetation, and Wildlife

Before commencing mine construction and throughout active operations, CRRC would salvage and stockpile all suitable growth media as practicable.

CRRC would salvage a representative sample of the cacti species present prior to mining and in sufficient quantity to allow for repopulation of the reclaimed area to approximately pre-mining density.

The primary environmental protection measures to reduce long-term effects on vegetation are outlined in the Reclamation Plan portion of this document.

Haul roads would be designed to minimize disturbance and would be constructed to avoid cacti, if practicable. Where avoidance is not possible, the cacti would be excavated and heeled-in near the site.

The event pond would be fenced to exclude terrestrial wildlife access, and netted to preclude avian access.

CRRC has committed to contracting with a qualified biologist to conduct breeding bird surveys within all suitable habitats prior to ground disturbance, if construction activities occur from March 15 through July 30 to comply with the Migratory Bird Treaty Act of 1918 and Executive Order 13186 (Land Bird Strategic Project). This survey would identify either breeding adult birds (i.e., by territorial defense behavior) or nest sites within the areas to be disturbed. If active nests are present, CRRC would then coordinate with the BLM to develop appropriate protection measures for these sites, which may include avoidance, construction constraints, buffer establishment, etc. An alternative option to conducting breeding bird surveys would be to avoid ground disturbance activities between March and July, allowing construction to proceed outside of the breeding season without clearance surveys.

Impacts to desert tortoise would be minimized by adhering to the terms and conditions of Biological Opinion File No. 84320-2008-F-0293. Tortoise exclusion fence would be constructed around the 595-acre Project area, except for the area of bare rock and steep topography on the east side of the proposed pits, which is not desert tortoise habitat.

Air Resources

Fugitive dust from traffic on roads at the Reward Project would be controlled by regular watering, as practical. Air emissions sources would be permitted, controlled and monitored as required by NDEP Bureau of Air Pollution Control Permit AP1041-2492.

Visual Resources

CRRC would minimize lighting impacts by using BMPs such as shielding and directing the lighting to where it is needed. However, there is a need to balance the lighting mitigation with the need to provide a safe working environment for the mine workers.

2.3 NO ACTION ALTERNATIVE

In accordance with BLM guidelines (H-1790-1, Chapter V), this EA evaluates the No Action Alternative. The objective of the No Action Alternative is to describe the environmental consequences that would result if the Proposed Action is not implemented. The No Action Alternative forms the baseline from which the impacts of all other alternatives can be measured.

Selection of the No Action Alternative would generally be inconsistent with the BLM multiple use mission and policy of making public lands available for a variety of uses as long as these uses are conducted in an environmentally sound manner. The subject lands were not withdrawn for any special use and were open, unappropriated lands when unpatented mining claims were located.

Under the No Action Alternative, CRRC would not develop the proposed Action. CRRC would continue exploration and reclamation under the existing Notice. The No Action Alternative would result from the BLM's disapproval of CRRC's *Reward Project Plan of Operations and Reclamation Plan*.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

In the process of developing the POO, CRRC considered various environmental constraints in relation to the placement and construction of facilities. These constraints included locations of known cultural sites, surface water locations, visual contrasts, depth to groundwater, and wildlife resources. In addition to environmental constraints, CRRC also had to consider land status and operational constraints. These alternatives included:

- Use the existing Barrick Bullfrog Well EW-3 and apply for a right-of-way for the pipeline to convey the water to the mine site. This included over nine miles of pipeline and several pumping stations. This alternative also involved tunneling under US 95 to extend the pipeline from Amargosa Valley to the Reward Mine site. This alternative was dropped when CRRC was able to develop water less than three miles away from the mine site on the east side of U.S. 95.
- Develop a new well in the Amargosa Valley and apply for a right-of-way for the pipeline to convey the water to the Reward Mine site. This alternative reduced the length of the pipeline to less than five miles, but required extending power to the well site and also involved tunneling under US 95 to extend the pipeline from Amargosa Valley to the Reward Mine site. This alternative was dropped when CRRC was able to develop water less than three miles away from the mine site on the east side of U.S. 95.
- Desorption of the loaded carbon at the Reward Mine site, rather than transport the loaded carbon to the Briggs Mine for processing. This alternative would require development of a gold recovery circuit at the Reward Mine with associated surface disturbance. This was determined not to be feasible for such a short-term mining Project.

3 AFFECTED ENVIRONMENT

This section includes descriptions of the affected physical, biological, and human resources in the Project area taken from data gathered during field investigations, Management Framework Plans (MFPs), BLM and other agency files, contact with BLM and other federal, state, and local agency resource personnel, and review of the literature.

The Affected Environment for the Proposed Action and the No Action Alternative are the same. Therefore the following discussion is applicable to both.

BLM's NEPA Handbook (H-1790-1) and applicable statutes, regulations, executive orders, or state guidelines dictate that certain resources which are present and have potential to be impacted by the Proposed Action and Alternatives must be considered in the NEPA analysis. Table 3-1 lists the resources for which supplemental authority requires that they be considered for this EA and the rationale for including or excluding the resource from the analysis. Those resources determined by the BLM specialists to be either not present or are not affected by the Proposed Action or Alternatives are not further addressed in this Environmental Assessment.

Table 3 - 1: Resources with Supplemental Authority which were Considered for Analyses of the Reward Project and Alternatives

Supplemental Authority	Not Present	Present/ Not Affected	Present/May be Affected	Rationale
Air Quality			✓	The proposed project is not within an area of non-attainment or areas where total suspended particulates or other criteria pollutants exceed Nevada air quality standards. There would be temporary increased particulate matter during the project construction. Impacts are assessed in EA.
Area of Critical Environmental Concern (ACEC)	✓			Resource is not present.
Cultural/Historical			✓	Cultural Resource sites are documented within the areas of proposed disturbance; however, none have been determined eligible for listing on the National Register of Historic Places, so there would be no effect from project activities.
Environmental Justice	✓			No minority or low-income groups would be disproportionately affected by health or environmental effects.
Farmlands Prime or Unique	✓			Resource is not present.
Noxious Weeds/Invasive Non-native Species			✓	A Noxious Weed Risk Assessment has been completed and appropriate prevention measures identified in a Noxious Weed Control Plan to be implemented during the project. Impacts assessed in EA.

Supplemental Authority	Not Present	Present/ Not Affected	Present/May be Affected	Rationale
Native American Religious Concerns			✓	Tribal representatives have been consulted and have expressed concerns with proposed project impacts.
Floodplains	✓			Resource is not present.
Riparian/Wetlands	✓			Resource is not present.
Threatened, Endangered, and Species.			✓	Desert Tortoise is present. Impacts assessed in EA.
Migratory Birds			✓	Impacts assessed in EA.
Waste – Hazardous/Solid			✓	None of the alternatives would result in creation of hazardous wastes.
Water Quality			✓	Impacts assessed in EA.
Wild & Scenic Rivers	✓			Resource is not present.
Wilderness	✓			Resource is not present.
Forests and Rangelands (HFRA only)	✓			Project does not meet HFRA criteria.
Human Health and Safety.			✓	Project may create public safety hazards. Impacts assessed in EA.

In addition to the resources with supplementary authority, there are other biological, physical, and human resources that BLM considers in the NEPA process. The resources that have been identified by public scoping and internal scoping as being present in the Project area are included in Table 3-2.

Table 3 - 2: Other Resources Considered for Analyses of the Reward Project

Other Resources	Not Present	Present/ Not Affected	Present/May be Affected	Rationale
Geology and Minerals			✓	Impacts assessed in EA.
Soils			✓	Impacts assessed in EA.
Vegetation Resources			✓	Impacts assessed in EA.

Other Resources	Not Present	Present/ Not Affected	Present/May be Affected	Rationale
Wildlife Resources			✓	Impacts assessed in EA.
Land Use and Access			✓	Impacts assessed in EA.
Recreation			✓	Impacts assessed in EA.
Aesthetics – Noise and Visual			✓	Impacts assessed in EA.
Social and Economic Values			✓	Impacts assessed in EA.
Hazardous Materials			✓	Impacts assessed in EA.

The resources listed in Tables 3-1 and 3-2 that are present with potential to be affected by the Proposed Action and Alternatives, are analyzed below.

3.1 LAND USE AND ACCESS

Land uses in the area include dispersed recreation and mineral exploration.

Only one right-of-way exists on the area; an existing telephone line right-of-way is located near the highway. Public access to the area is via US Highway 95 from Beatty, Nevada, to an unnamed gravel road approximately eight miles south of Beatty. The gravel road extends approximately three miles to an unnamed canyon due north of Carrara Canyon.

The remains of the Elizalde Company Complex, a concrete factory that never went into production, occur along the main access road. The BLM permitted the use of the site for filming in the past and the site may be used again in the future

3.2 GEOLOGIC RESOURCES

The Project Area is located within the Great Basin region of the Basin and Range physiographic province, which is characterized by elongated, north-trending, fault-bounded mountain ranges separated by alluvial valleys. The Project area is bounded to the east by Bare Mountain, which is composed of late Precambrian to late Paleozoic sedimentary rocks that have been subjected to repeated episodes of folding and faulting. The western edge of the Project area is within the Amargosa Desert, the surface of which is Quaternary alluvium.

Geologic formations in the Project area consist of late Precambrian to late Paleozoic sedimentary rocks of the Bare Mountains that have been intensely deformed by folding during the late Paleozoic or Mesozoic, intense thrust and lateral faulting in the Mesozoic, and normal faulting in the late Tertiary to Holocene (Cornwall 1972). The Paleozoic sediments are intruded by monzonite porphyry, pegmatites, and Tertiary volcanic rocks, (Ball 1907; Hill 1912; and Stoddard 1932). Topographic relief of the Project area ranges from a low of 2,930 feet to a high

of approximately 4,900 feet amsl. The geomorphology of the Project area is generally characterized by massive alluvial fans extending down slope from the Bare Mountains.

The Reward deposit is a shallow ore deposit that is bounded on the west by the Sterling formation. This is a white massive quartzite of the locally recognized Juhl member which forms the footwall of the ore zone. The bulk of the ore deposit occurs within the Wood Canyon Formation. This formation can be further distinguished into three units: an interbedded quartzite, phyllite, and minor schist; quartzite; and a silicified sandy and silty dolomite. The Bonanza King Dolomite and Carrara Formation overlie the Wood Canyon Formation in the area of the proposed open pit. However, these carbonate rocks are also overlain by the Wood Canyon Formation at the north end of the proposed open pit. The two carbonate units account for only a minor portion of the volume of material in the proposed open pit. The surface of the Project area is composed of Quaternary alluvium and colluvium which consist mainly of limestone, marble, and dolomite fragments transported by gravity from the Carrara Formation and Bonanza King Dolomite exposures in the bluff located immediately east of the ore zone.

No fault scarps, which would suggest recent seismic activity, have been identified in the immediate Project area. The seismic Zone map in the Uniform Building Code shows the Project area as zone 2B on a scale ranging from one (indicating less damage expected) to four (indicating the most damage expected). The most recent seismic event in the area occurred on December 30, 2007, approximately nine miles south of Beatty, Nevada with a magnitude of 2.7 on the Richter scale. The largest recorded seismic events within 25 miles of the Project area occurred in 1976 and 1994 and measured 4.1 on the Richter scale (USGS NEIC 2008).

3.3 SOILS

Soil survey data for the Project area is described in the soil survey for the southwest part of Nye County, Nevada (National Resource Conservation Service [NRCS] 2006). Soils near the Project are described in Table 3-3. Each soil association is composed of one or more individual soils that have specific characteristics that allow them to be distinguished from other association soils.

Site-specific soils within the Project area are a mixture of colluvium and talus. Slopes and hilltops have extensive bedrock exposures. Drainages contain coarse-grained alluvium consisting of a poorly sorted, gravelly, skeletal, dark grayish brown silt loam with angular to subangular gravel, cobbles, and boulders. Soil horizons are weakly developed. A moderately well-developed desert pavement covers stable surfaces. None of the soils identified by the NRCS meets the criteria to be considered prime or unique farmlands. The quality of these existing soils for reclamation purposes is considered poor, due primarily to the course nature (i.e., sandy, gravelly, or cobbly soils), low available water capacity, and shallow depth of some soils. The rating of these soils as poor for reclamation does not mean they cannot be used for reclamation; however, the amount of vegetative cover achieved during reclamation may be limited due to the soil characteristics mentioned above. Table 3-4 presents soils specific to the Project area and projected quantities or stockpiled growth media. Figure 3-1 is a map showing the location and extent of the soils described in Table 3-4.

The projected cubic yards presented in Table 3-4 represent estimates based on the soil survey (NRCS 2006). Actual field experience indicates that the soils are generally shallow and that there is likely to be less growth media available for stockpiling than provided in these estimates. The estimated amount of growth media would provide for a depth of between six and nine inches on the reclaimed facilities (i.e., all disturbance acreage except any open pit areas that would not be completely backfilled).

Table 3 - 3: Soils in the Vicinity of the Project Area

NRCS Map Unit	Soil Series & Surface Texture	Classification	Reaction	Permeability	Available Water Capacity (Inches)	Hydrologic Group	Water Erosion Hazard	Wind Erosion Hazard	Landscape Position/% Slope	Depth To Bedrock	Topsoil Suitability
2053	Yermo very gravelly sandy loam	Typic Torriorthents loamy-skeletal, mixed, calcareous thermic	Moderately alkaline	Moderate	4.2	B	Slight	Slight	Fan collars, side slopes of fan remnants 15%-30%	>60”	Poor
	Greyeagle very gravelly sandy loam	Typic Durargids loamy-skeletal, mixed thermic	Moderately alkaline	Moderately rapid	0.06	D	Slight	Slight	Summits of fan remnants 8%-15%	8-14” Hardpan	Poor
	Arizo very gravelly, sandy loam	Typic Torriorthents sandy-skeletal, mixed thermic	Moderately alkaline	Very rapid	3.0	A	Slight	Moderate	Inset fans 4%-15%	>60”	Poor
2054	Yermo, Hot very gravelly sandy loam	Typic Torriorthents loamy-skeletal, mixed, calcareous thermic	Moderately alkaline	Moderate	4.2	B	Slight	Slight	Fan collars, side slopes of fan remnants 2%-4%	>60”	Poor
	Yermo very gravelly sandy loam	Typic Torriorthents loamy-skeletal, mixed, calcareous thermic	Moderately alkaline	Moderate	4.2	B	Slight	Slight	Fan collars, side slopes of fan remnants 2%-4%	>60”	Poor
	Arizo, very gravelly, sandy loam	Typic Torriorthents sandy-skeletal, mixed thermic	Moderately alkaline	Very rapid	3.1	A	Slight	Moderate	Inset fans 2%-4%	>60”	Poor
2081	Rock Outcrop										
	St. Thomas very cobbly loam	Lithic Torriorthents loamy, skeletal, carbonatic thermic	Moderately alkaline	Moderately rapid	0.7	D	Moderate	Slight	Side slopes of hills 30%-75%	4” to 20”	Poor
	Tecopa extremely gravelly sandy loam	Lithic Torriorthents loamy-skeletal, mixed, calcareous thermic	Moderately alkaline	Moderate	0.3	D	Moderate	Slight	Side slopes of hills 15%-75%	2” to 10”	Poor
2301	Rock Outcrop										
	Tecopa extremely gravelly sandy loam	Lithic Torriorthents loamy-skeletal, mixed calcareous thermic	Moderately alkaline	Moderate	0.03 to 0.06	D	Moderate	Slight	Side slopes of hills 15%-50%	2” to 10”	Poor
	Haleburu extremely gravelly sandy loam	Lithic Torriorthents loamy-skeletal, mixed, thermic	Moderately alkaline	Moderately rapid	0.6	D	Moderate	Slight	Side slopes of hills 15%=50%	4” to 14”	Poor

Table 3 - 4: Soils Specific to the Project Area and Estimated Volume for Reclamation

Facility	Soil Map Unit	Soil Series & Surface Texture	Depth Of Topsoil (Inches)	Acres	Volume (Cubic yards)
Open Pit	2301	Rock Outcrop; Tecopa extremely gravelly sandy loam; Haleburu extremely gravelly sandy loam	5	35.1	23,610
	2053	Yermo very gravely sandy loam; Greyeagle very gravelly sandy loam; Arizo very gravelly sandy loam.	8	11.2	13,550
	2081	Rock Outcrop; St. Thomas very cobbly loam	2	1.3	360
	Subtotal			47.6	37,520
North Waste Rock Dump	2301	See Map unit 2301 above	5	43.0	28,930
	2053	See Map unit 2053 above	8	11.5	13,920
Gold Ace Waste Rock Dump	2053	See Map unit 2053 above	8	29.7	35,940
Southwest Waste Rock Dump	2301	See Map unit 2301 above	5	15.3	10,290
	2053	See Map unit 2053 above	8	17.9	21,660
	Subtotal			117.4	110,740
Roads	2053	See Map unit 2053 above	8	27.3	33,030
	Subtotal			27.3	33,030
Process related (Heap, Crusher, & Ancillary)	2301	See Map unit 2301 above	5	4.6	3,090
	2053	See Map unit 2053 above	8	89.8	108,660
	Subtotal			94.4	111,750
	TOTAL			286.7	293,040

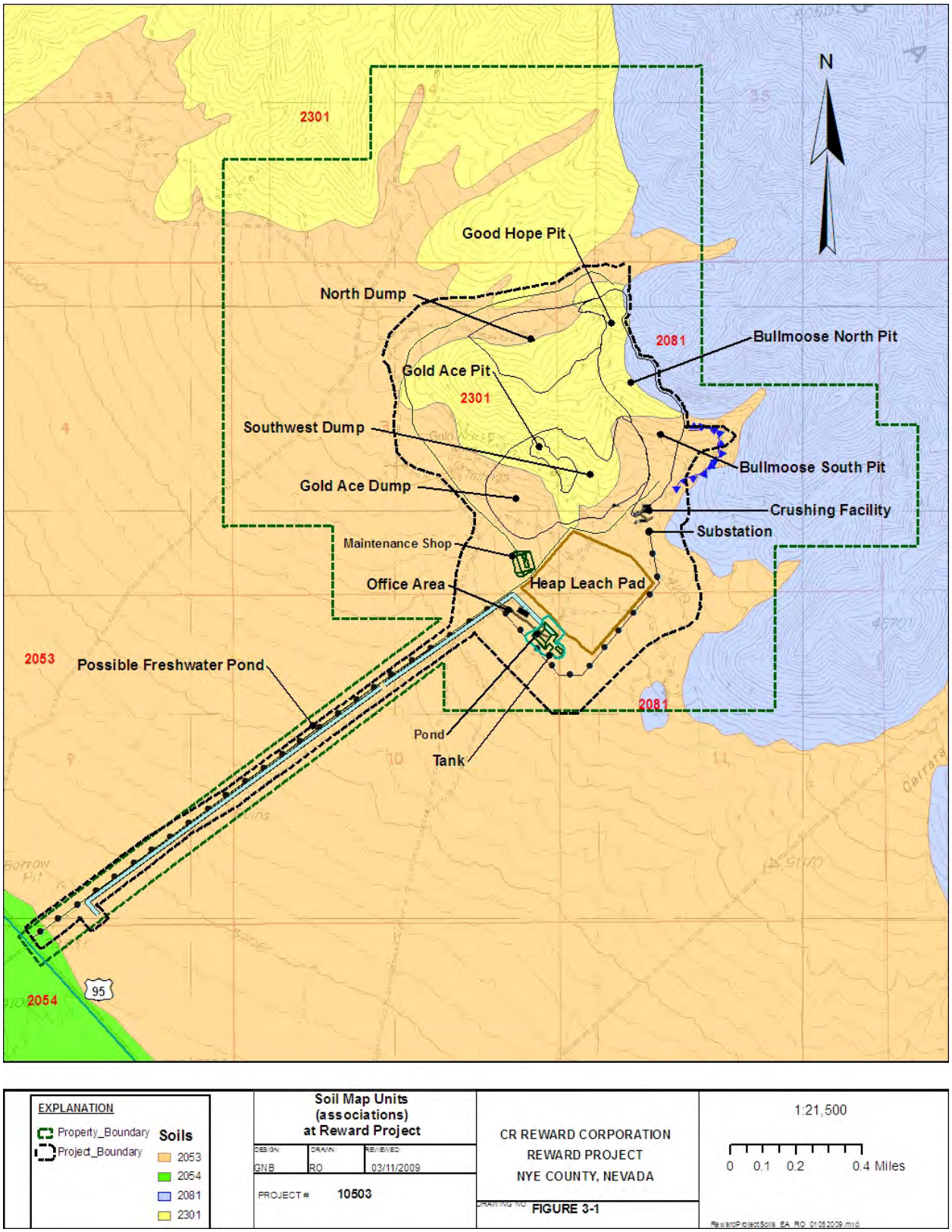


Figure 3 - 1: Soil Map Units (Associations) at the Reward Project

3.4 AIR QUALITY

The Project area is located in a semiarid region, with a climate characterized by warm, dry summers and cool winters. The temperature ranges from an average daily minimum of 36° F in February to an average daily maximum of 99° F in July. The annual precipitation is approximately four inches per year.

The Project area is located within the Amargosa Desert Air Basin as designated by the Nevada Bureau of Air Pollution Control (BAPC). The basin is designated as an "unclassified" basin relative to attainment of the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants (particulate matter less than 10 microns, carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, and lead). An unclassified area is one for which sufficient ambient air quality data are not available to determine attainment. Unclassified basins are managed as if they are in attainment.

Baseline air quality and meteorological conditions at the Project area were estimated from the closest air quality monitoring facility located at the Bullfrog Mine in Rhyolite, Nevada (approximately nine miles to the northwest). The two samplers for particulate matter less than 10 microns (PM_{10}) located at the Bullfrog Mine site were used to collect air quality and meteorological data from April 1992 through June 1995. The PM_{10} samplers were calibrated on a quarterly basis and the meteorological sensors were calibrated every six months as per State of Nevada guidelines. The PM_{10} data collected indicated that the ambient air quality meets the state and federal PM_{10} 24-hour ambient air quality standard of 150 micrograms per cubic meter (ug/m^3) and annual PM_{10} state and federal standard of 50 ug/m^3. There were no exceedances for the 24-hour or annual PM_{10} standard. Table 3-5 presents a summary of the ambient air quality data collected at the Bullfrog Mine site from April 1992 through June 1995.

Table 3 - 5: Summary of Bullfrog Mine 24-Hour PM_{10} Data, April 1992 through June 1995

Sampler Number	Maximum Concentration (ug/m^3)	Second Highest Concentration (ug/m^3)	Arithmetic Average (ug/m^3)	Number of Samples
0	50	48	18.3	188
2	55	54	18.4	188

3.5 CULTURAL RESOURCES

The entire 595 acres of proposed disturbance area that is to be fenced has been archaeologically inventoried and assessed during four separate cultural resource investigation reports: refer to BLM Cultural Resource Reports 5-2307 in 1995, 5-2371 in 1998, 5-2383 in 1999, and 5-2575 in 2007. The project area lies within the historic Bare Mountain Mining District that played a role in the constellation of southwestern Nevada mining booms occurring during the first decade of the twentieth century. This was the same time as the famous Bullfrog District boom near Tonopah and Goldfield.

Eighteen historic mining-associated sites from that time and later have been recorded within the proposed area to be affected which include mining complexes with adits, shafts, and pits, refuse scatters, road segments, a water pipeline and utility line, and the Elizalde cement plant. They include: 26Ny11001, 26Ny11002, 26Ny11003, 26Ny11004, 26Ny11005, 26Ny12816,

26Ny12817, 26Ny12818, 26Ny12819, 26Ny12820, 26Ny1821, 26Ny12822, 26Ny12823, 26Ny12824, 26Ny12825, 26Ny12826, 26Ny12827/11086, and 26Ny12828. The Gold Ace (Bull Moose) Mine (26Ny11002) was one of the better known mining complexes within the project area.

All eighteen sites were formally recorded, evaluated, and determined to be not eligible for listing on the National Register of Historic Places (NRHP) under any of the Secretary of the Interior's criteria. Thus the proposed undertaking will not pose an effect to any historic properties within the proposed Reward Mine activity areas.

3.6 NATIVE AMERICAN RELIGIOUS CONCERNS

The Reward Project was evaluated for traditional cultural properties and cultural resource sites. The level of evaluation of the area of Project effect was commensurate with the size and scope of the undertaking. A review of the existing data revealed no information concerning prehistoric sites. There was no ethnographic information found to indicate a potential for traditional cultural properties or any other significant prehistoric sites. An intensive on-the-ground inventory was conducted of the entire area of potential effect, and as a result, with the exception of a non-significant lithic scatter, all the sites identified were historic (i.e., related to European man's presence). There was nothing to indicate the potential for sensitive Native American sites.

A site visit by members of the Timbisha Shoshone Tribe was conducted on September 26, 2007. There were concerns raised as to whether or not an ethnographic study would be prepared for the area, how the mining would affect the ecosystem, potential contamination of the ground and surface water, potential affect to water quantity, and the need for a tribal monitor to be on site during construction.

3.7 WATER RESOURCES

3.7.1 General Hydrologic Setting

The Bare Mountains form a portion of the northeastern perimeter of the Amargosa Desert Hydrographic Basin. This Hydrographic Basin is also bounded by the Bullfrog Hills to the north, the Specter and Last Chance ranges to the east, the Grapevine and Funeral Mountains of California to the West, and the Greenwater Range to the south (Kilroy 1991). Intermittent streamflows from these ranges that form the perimeter of the Amargosa Desert discharge water to tributaries of the Amargosa River, which traverses the desert and is a dry wash most of the year. The basin drains to the south and is part of the larger Death Valley regional groundwater flow system (D'Agnese et al. 2002).

The Amargosa Desert Hydrographic Basin is part of the Death Valley Basin regional flow system (Winograd and Thordarson 1975, Nevada Division Water Resources 2005). The principal recharge area of this system is the Timber Mountain area, approximately 20 miles northeast of the Project. Additional recharge occurs in the Grapevine Mountain, approximately 25 miles west-northwest of the Project area (Faunt et al. 2004) and inter-basin groundwater flow from the Oasis Valley Basin through the Amargosa Narrows, approximately four miles northwest of the Project area (Reiner et al. 2002).

No perennial streams or springs are located within the Project area; however, there is evidence of ephemeral streams. Several steep incised tributary canyons, including Carrara and Tungsten Canyons, indicate surface flow originating from storm events. The amount of incision is due in part to the steep topographic gradients along the alluvial fans between the canyons and the valley floor (Amargosa Desert) which lie approximately 1,000 feet lower and two miles southwest of the Project. During extended storm events, surface run-off may flow from these

drainages to the Amargosa River. Surface drainage for the proposed Reward Project area is shown on Figure 3-2.

Available streamflow data for the Amargosa River, near the Amargosa Narrows, are not representative of the amount of precipitation recorded at the two precipitation gauges in the region. Precipitation along the river generally averages four inches per year and makes the Amargosa Desert one of the driest places in the United States (Kane et al. 1994). However, streamflow measurements for the ephemeral Amargosa River indicate that large storms in the nearby mountain ranges can yield large stream flows. In July 1990, peak flows of the Amargosa River reached approximately 83,000 gpm, measured three miles south of Beatty, Nevada (Kane et al. 1994). The Federal Emergency Management Agency (FEMA) has designated the Project area Zone X, or an area of moderate flood hazards because of such storm events.

The Amargosa River is a losing stream south of Beatty. Surface flows are lost to the alluvial valley fill. Mean flow measurements at the gage at the south end of the Amargosa Narrows are typically about one-tenth of those at the gage 2.1 miles upstream in Oasis Valley (USGS 2006). The Amargosa River channel is typically dry throughout Amargosa Valley, except during infrequent flood events.

The Death Valley Flow System consists of 30 individual hydrographic basins within a 16,000 square-mile area of the Great Basin Physiographic Province (Harrill et al. 1988). The hydrographic basins are interconnected through a 13,000 to 16,400 foot-thick sequence of Paleozoic carbonate rock, which forms the “carbonate aquifer.” According to Winograd and Thordarson (1975), this carbonate aquifer is confined by underlying Precambrian and Cambrian formations and by overlying late Paleozoic limestone and shale. The Project area is located along the east edge of this hydrographic basin. A ridge of low permeability metasedimentary rocks that forms the Bare Mountain Range and the basement of the Bullfrog Hills, to the west-northwest, act as a groundwater flow barrier, limiting subsurface flow from Oasis Valley to the south into Amargosa Valley alluvial aquifer through the Amargosa Narrows, south of Beatty (Reiner et al. 2002).

The exact elevation of the groundwater table within the Project area is not known; however, it is well beneath the level of the proposed pit development. The inferred potentiometric surface is approximately 2,600 feet amsl (See Figure 2-5). More than 290 exploration drill holes in the Project area failed to encounter the carbonate aquifer between the surface and elevation 3,400 feet amsl. Glamis drilled a well in 1997 at the northern end of the Bare Mountains, approximately three miles north of the Reward Project. This well was drilled into the carbonate aquifer at approximately 2,100 feet amsl, or 700 feet below the ground surface at this location (HIS Geotrans 1997). The closest groundwater bearing part of the lower carbonate aquifer at the Reward Project is the Carrara Formation, which is at least 1,200 feet below surface (Water Management Consultants 2006).

A second, more localized basin fill aquifer is known to exist west of the Project area at the lower elevations of the Amargosa Desert Hydrographic Basin (Winograd and Thordarson 1975). This unconfined aquifer occurs in the alluvium or basin-fill deposits located in structural depressions between the mountain ranges that consist of unconsolidated to partly consolidated deposits derived from adjacent mountains. The deposits may reach a thickness of 10,000 feet (Thomas et al. 1986). Continuous groundwater flow systems are generally formed by hydrologically connected basin fill reservoirs and underlying carbonate rocks or structural features. Within the Amargosa Desert, the basin fill includes alluvial fan deposits, stream deposits, and dune sand. Groundwater movement within the Amargosa Desert basin fill is generally southeastward along the axis of the desert (Walker and Eakin 1963). Groundwater discharge from the Amargosa

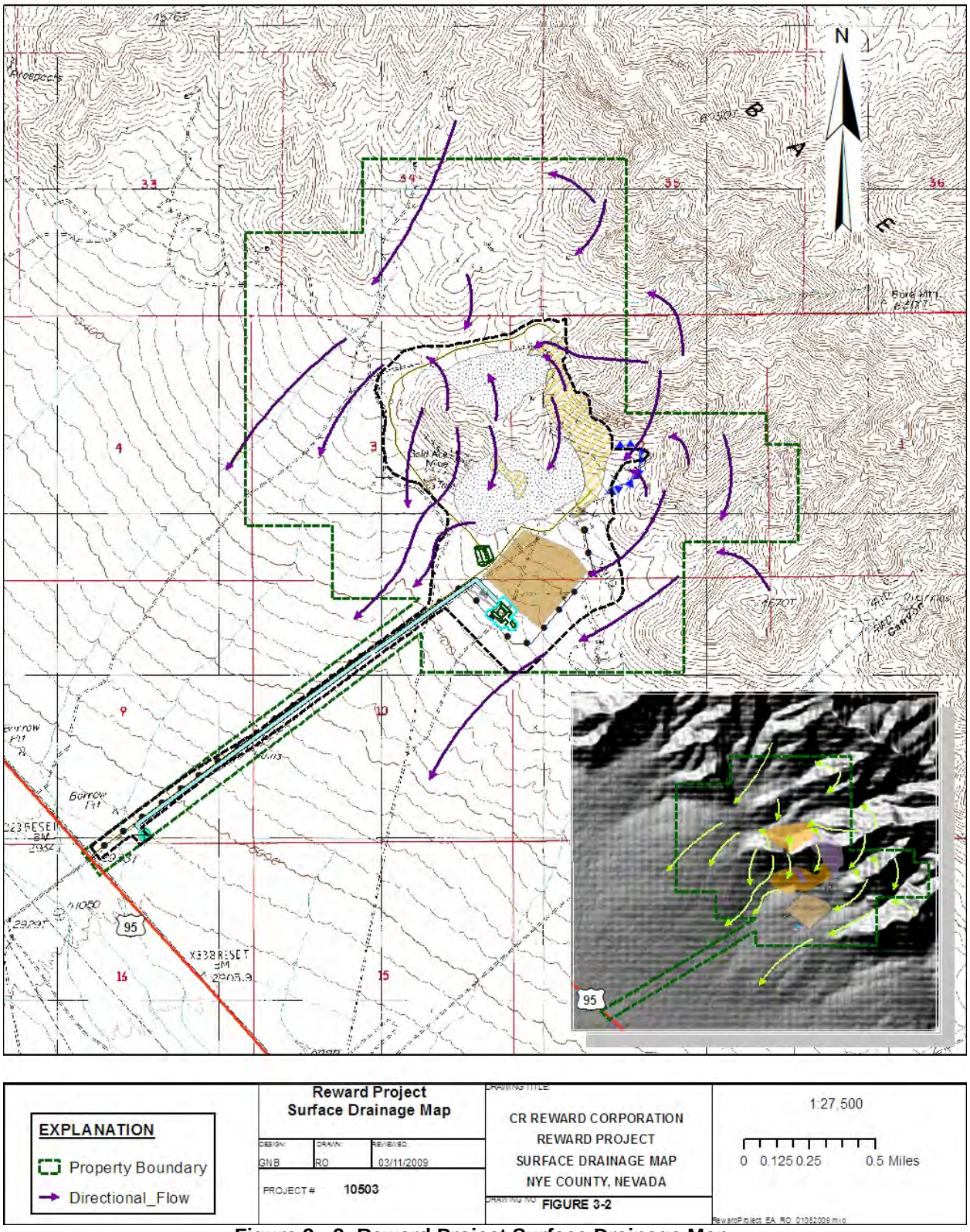


Figure 3 - 2: Reward Project Surface Drainage Map

Desert Valley occurs predominantly along a fault-controlled, ten-mile spring line at Ash Meadows, about 30 miles southeast of the Project area.

The alluvium in the area of the proposed well is deposited in a wedge against steeply dipping bedrock. The well would be screened in the alluvial aquifer. The surrounding geology forms a hydrologic boundary to the north, northwest, and southwest of the well. A fault to the east of the well provides another hydrologic boundary. A third hydrologic boundary may exist to the southeast due to the presence of a subsurface ridge of relatively impermeable rocks extending to the southwest from Bare Mountain (Winograd and Thordarson 1975). Therefore, the existing well is bounded on three sides, and possibly four sides, by bedrock characterized as an aquitard and by the extent of the saturated alluvium.

A well drilled approximately two miles northwest and 800 feet lower in elevation than the Reward Project encountered water at 45 feet bgs within the basin fill aquifer. However, mineral exploration boreholes in the Project area did not encounter the basin fill aquifer or any perched water tables to an elevation of 3,400 feet amsl.

Groundwater development and use in the vicinity of the Project area are generally limited to the town of Beatty and surrounding areas and active mines. The major water users of record according to the Nevada State Engineer (1998) are Beatty Water and Sanitation District, Oasis Land, Beatty G.I.D., Stirling Mine, Rayrock (Glamis) Mines, the A. Revert Trust, BKK Company, and Barrick Bullfrog Enterprises. Most of the water appropriated in the Amargosa Desert Hydrographic Basin is used for mining and milling purposes, a substantial portion of the remaining appropriation is used for domestic, irrigation, and recreational purposes. According to the Nevada State Engineer, each of the three hydrographic basins in the vicinity of the Project; Oasis Valley, Crater Flat, and Amargosa Desert, is over-appropriated. Most of the current water rights in the area are either certificated or permitted, and only one is vested.

3.7.2 Water Quality

Surface water quality in the area is not well known due to the fact that most local drainages in the area are dry. The closest springs to the Project area are located within the Amargosa Narrows south of Beatty along US Highway 95 and at Specie Spring which is located in Oasis Valley on the northeast flank of the Bare Mountains, approximately three miles northeast of the Project area. Water quality analyses for several springs located along Amargosa Narrows and within Oasis Valley to the northwest indicate total dissolved solids range from approximately 150 to 800 mg/l. Discharges from individual springs in this area range up to 400 gpm (McKinley et al. 1991).

Available water quality data within the vicinity of the proposed Project indicate groundwater in the area is generally potable. Groundwater samples from the alluvial aquifer around Bare Mountain revealed that total dissolved solids (TDS) concentrations range from 222 to 1,080 mg/l. Similarly, available water quality data on the carbonate aquifer revealed that TDS concentrations ranged from 319 to 508 mg/l. Groundwater samples taken from the Tertiary volcanics in Crater Flat and near Yucca Mountain indicated TDS concentrations ranged from 220 to 347 mg/l (McKinley et al. 1991).

3.7.3 Water Budget

Recharge to the valley-fill aquifer from precipitation is effectively zero, as a consequence of the low annual rainfall and high evaporation rate. Chloride-mass balance estimates of long-term deep percolation rates through the unsaturated zone beneath an undisturbed, vegetated area at the Amargosa Desert Research Site (ARDS), about five miles south of the Reward Project, suggested that percolation of precipitation below a depth of 32 feet has been minimal or non-existent for at least 6,000 (Fouty 1989) to 16,000 years (Prudic 1994).

The majority of recharge to the valley-fill aquifer in the Reward area occurs as inter-basin flow of groundwater from Oasis Valley at the Amargosa Narrows. Estimates of the volume of this flow range from a low of between 30 and 130 acre-feet/year (Reiner et al. 2002), to a high of 400 acre-feet/year (Malmberg and Eakin 1962).

Additional recharge derived from runoff from the Grapevine Mountains at the northwest end of the Amargosa Valley and from Bare Mountain northeast of the site is unknown, but suspected to be small because of the low elevation of these ranges (i.e., 8,000 feet and 6,000 feet, respectively).

Evapotranspiration rates are high in the Amargosa Valley, with average yearly rates of approximately 75 inches (WMC 2008). However, the deep water table in the northern part of the valley precludes this from being a significant means of discharge from the valley-fill aquifer.

3.7.4 Waters of the United States

There are no wetlands or riparian areas within the Project area (Roukey 1998). The nearest areas having wetland vegetation are Specie Spring, located approximately three miles northwest of the Project area and Amargosa Narrows, located approximately five miles northwest of the Project area.

Four ephemeral washes occur in or adjacent to the Project: one located along the north end of the Project area; a second wash located just north of the proposed Reward Pit and North Dump; another in the area of the proposed heap leach facility; and a fourth was found along the proposed water line route. The channels extend to the Amargosa Valley, which is part of a closed basin.

3.8 VEGETATION

3.8.1 General Plant Communities

The Project area is located within the northeastern portion of the Mojavian Floristic region. This region is characterized by moderate to high mountain ranges and intervening valleys which generally follow a north-south parallel pattern (Cronquist et al. 1972). The Mojave Desert is characterized by hot, dry summers and cool, dry winters (Thorne et al. 1981). Precipitation within the desert typically occurs from either winter rains or summer thundershowers. In general, the vegetation of the Mojave Desert is dominated by low, widely-spaced shrubs, which develop in response to limited rainfall.

The Project area includes an elevation range of approximately 2,900 feet to 4,600 feet. Topography varies from a gently sloping alluvial fan to steep rocky hills. Plant communities vary along elevation gradients due to differences in the amount of rainfall and varying soil types (MacMahon 1985). The communities vary from a predominately creosote bush community at the lower elevations to a mixed desert shrub community at higher elevations. Cacti are common in both plant communities.

The primary vegetation community within the Project area is the creosote bush desert scrub type occupying the gently sloping alluvial fans and valleys (Figure 3-3). A mixed desert shrub vegetation type occupies the upper elevations of the Project. Small isolated areas of disturbed land occur within the Project area, created by historical mining activities and modern day exploration practices. A list of plants observed within the Project area during the Vegetation Survey is provided in Table 3-6.

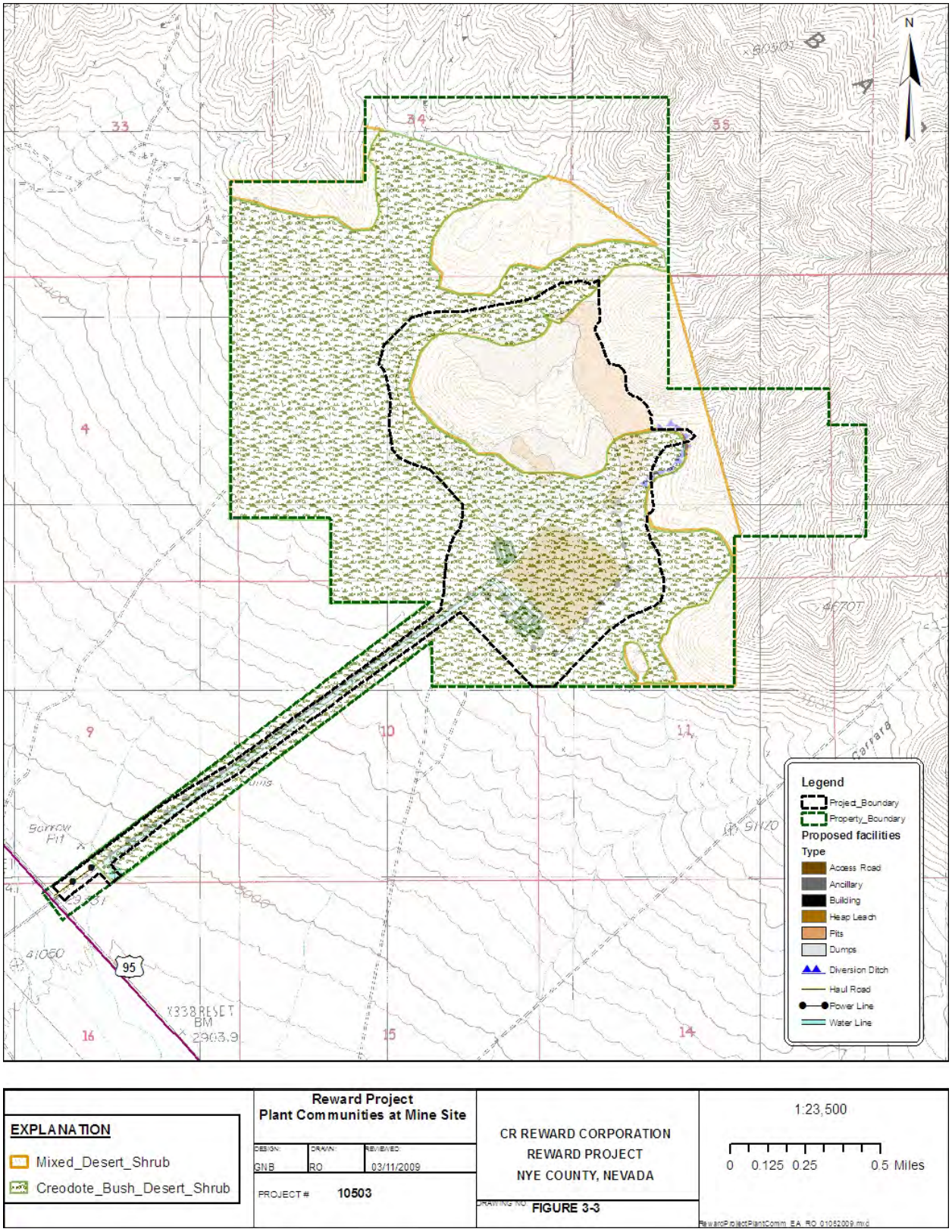


Figure 3 - 3: Plant Communities at the Reward Mine site.

Table 3 - 6: Plant Species Observed within the Project Area

Common Name	Scientific Names
Beavertail cactus	*Opuntia basilaris*
Gold cholla	*Opuntia echinocarpa*
White bursage	*Ambrosia dumosa*
Cottontop cactus	*Echinocactus polycephalus*
Creosote	*Larrea tridentata*
Desert trumpet	*Eriogonum inflatum*
California buckwheat	*Eriogonum fasciculatum*
Fluffgrass	*Erioneuron pulchellum*
Globe mallow	*Sphaeralcea ambigua*
Hedgehog cactus	*Echinocereus engelmannii*
Prince's plume	*Stanleya pinnata*
Russian thistle	*Salsola iberica*
Skeleton weed	*Eriogonim deflexum*
Spiny chorizanthe	*Chorizanthe ridida*
Desert larkspur	*Delphinium parshii*
Indigo bush	*Psorothamnum fremontii*
Mojave aster	*Zylorhiza tortifolia*
Mustard species	*Descurania* sp.
Plantain	*Plantago insularis*
Snakeweed	*Gutierrezia microcephala*
Spiny menodora	*Menodora spinescens*
Red brome	*Bromus madratensis var. rubens*
Shadscale	*Atriplex confertifolia*
Spiny hopsage	*Grayia spinosa*
Winterfat	*Ceratoides lanata*
Nevada ephedra	*Ephedra nevadensis*
Fourwing saltbrush	*Atriplex canescens*
Widow's locoweed	*Astragalus layneae*
Blackbrush	*Coleogyne ramosissima*
Brittlebrush	*Encelia farinose*
Fiddleneck	*Amsinckia*, sp.
Indian paintbrush	*Castelleja,* sp.
Desert needlegrass	*Stipa speciosa*
Indian ricegrass	*Oryzopsis hymenoides*
Notch-leafed phacelia	*Phacelia crenulata*
Yellowcups	*Camissonia brevipes*
Desert marigold	*Baileya multiradiata*
Desert chickory	*Rafenesquia neomexicana*
Fleabane	*Erogeron divergens*
Many-spiked fishhook	*Mammillaria tetrancistra*
Fremont pincushion	*Chaenactis fremontii*
Filaree	*Erodium circutarium*
Desert rue	*Ruta groveolens*
Mexican bladdersage	*Salazaria mexicana* Torr.

Source: Converse Consulting 1999 and Converse Consulting 2008.

3.8.2 Noxious Weeds

No noxious weeds were observed within the Project area during field surveys conducted in 1999 and 2007. Saltcedar (*Tamarix* sp.) has been observed at the Amargosa Narrows, approximately three miles from the Project area, where surface and near surface water is available.

3.9 WILDLIFE

The creosote bush desert scrub and mixed desert shrub vegetation types provide habitat for a limited number of wildlife species which are uniquely adapted to the high temperatures, low precipitation, and specialized vegetation of the region. The Project area was surveyed in 1998 and in 2006 to determine the wildlife resources present.

3.9.1 Mammals

A number of species of mammals are expected to occupy or use the Project area on a year-long or seasonal basis. A partial list of the more common species associated with the vegetation types of the area includes the following: coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), jackrabbit (*Lepus californicus*), cottontail rabbit (*Sylvilagus auduboni*), bobcat (*Felis rufus*), desert kangaroo rat (*Dipodonmys deserti*), white-footed mouse (*Peromyscus* spp.), and the whitetail antelope squirrel (*Ammospermophilus leucurus*). Also observed within the Project area by Converse Consultants were Desert bighorn sheep (*Ovis canadensis nelsoni)*(see Special Status Species, Section 3.11).

3.9.2 Birds

A variety of bird species are expected to inhabit or use the Project area on a year-long or seasonal basis. A complete list of bird species observed by Converse Consulting in the proposed Project area while conducting the wildlife surveys is found in Table 3-7.

Table 3 - 7: Bird Species Observed within the Project Area

Common Name	Scientific Name
White-throated swift	*Aeronnautes saxatalis*
Mourning dove	*Zenaida macroura*
Common raven	*Corvus corax*
Black-throated sparrow	*Amphispiza bilineata*
Red-tailed hawk	*Buteo jamaicensis*
Prairie falcon	*Falco mexicanus*
American kestrel	*Falco sparverius*
Greater roadrunner	*Geococcyx californianus*
House finch	*Carpodacus mexicanus*
Western kingbird	*Tyrannus verticalus*
Ash-throated flycatcher	*Myiarchus cinerascens*
Rock wren	*Salpinctes obsoletus*
Say's phoebe	*Sayornis saya*

Source Converse Consulting 1999 and Converse Consulting 2008.

On January 11, 2001, President Clinton signed Executive Order 13186 (Land Bird Strategic Project) placing emphasis on conservation and management of migratory birds. These species are not protected under the Endangered Species Act, but they are protected under the Migratory Bird Treaty Act of 1918. Management for these species is based on Instruction Memorandum – IM 2008-050 dated December 18, 2007. The only migratory bird species of concern that occurs or likely occurs in the Project area is the prairie falcon.

3.9.3 Reptiles and Amphibians

Reptiles are a common component of the desert fauna. During the wildlife surveys, the western desert horned lizard (*Phrynosoma platyrhinos*), Desert iguana (*Dipsosaurus dorsalis*) Western whiptail lizard (*Cnemidophorus tigris*), common side-blotched lizard (*Uta stansburiana*), long-nosed leopard lizard (*Gambelia wislizenii*), Mojave black-collared lizard (*Crotaphytus bicinctores*), zebra-tailed lizard (*Callisaurus draconoides*), desert-spiny lizard (*Sceloporus magister*), and chuckwalla (*Sauromalus obesus*) were observed. During the detailed survey, the coachwhip (*Masticophis flagellus*) and gopher snakes (*Pituophis melanoleucus*) were observed.

In contrast, only limited opportunities exist in desert environments for habitation by amphibian species. Talus slopes, crevices, and moist soil conditions provide retreats for amphibians. Seeps and springs provide adequate and necessary breeding environments. The lack of permanent water resources in the Project area makes it unlikely that amphibians would be present. No amphibians were found in the Project area during the wildlife surveys.

3.10 SPECIAL STATUS SPECIES

3.10.1 Plants

Two sensitive plant species were identified by the Nevada Natural Heritage Program (NNHP) as potentially present within the Project area. The BLM identified six sensitive plants of concern, and the U.S. Fish and Wildlife Service (USFWS) identified two additional species of concern that may occur near the Project area. The list of sensitive plants that could potentially occur within the Project area is provided in Table 3-8.

Table 3 - 8: Sensitive Plant Species with Potential to Occur within the Project Area

Common Name	Scientific Name
Black woolypod or Funeral Mountain Milkvetch	*Astragalus funereus*
Amargosa penstemon	*Penstemon fruticiformis ssp. Amargosae*
Pahute Mesa beard tongue	*Penstemon pahutensis*
Ripley gilia	*Gilia ripleyi*
Delicate rockdaisy	*Perityle intricate*
Mojave sweetpea	*Lathyrus hitchcockianus*
Mojave fishhook cactus	*Sclerocatus polyancistrus*
Clokey eggvetch	*Astragalus oopherous var. clokeyanus*
White bearpoppy	*Arctomecon merriamii*
Halfmoon milk vetch	*Astragalus mahavensis var. hemigyrus*

Source Converse Consulting 1999 and Converse Consulting 2008.

3.10.1.1 Funeral Mountain Milkvetch

Habitat for the Funeral Mountain milkvetch usually consists of unstable, steep, gravelly slopes of volcanic tuff, or occasionally limestone scree slopes. The shadscale vegetation type within the Project area contains plant species typically associated with Funeral Mountain milkvetch. However, no individuals of this species were observed within the Project area in 1999 or 2007.

3.10.1.2 Mojave Sweetpea

The Mojave sweetpea is known to occur east of Busch Peak, between Gold Bar and Bullfrog Mountain, and at four locations north of the general Project area. Habitat for the Mojave

sweetpea includes washes and canyon bottoms in rocky volcanic gravelly or sandy soil. This species was not observed within the Project area in 1999 or 2007.

3.10.1.3 Mojave Fishhook Cactus

The Mojave fishhook cactus is known to occur west of Rhyolite, north of Rainbow Mountain, at Ladd Mountain, and near the Montgomery-Shoshone area. The Mojave fishhook cactus is protected under the Nevada Cactus-Yucca law, which protects all succulent and cactus species in Nevada.

Mojave fishhook cactus generally occupies a variety of habitats including desert flats, mesas, rocky slopes, and knolls. Although several species of cacti were observed within the Project area, the Mojave fishhook cactus was not found in 1999 or 2007.

3.10.1.4 Ripley Gilia

Ripley gilia exists only in southern Nevada. It is found in the Bare Mountains, the Nevada Test Site at the Spector range, and in the Spotted Range in Nye County. It occupies exposed crevices of limestone cliffs and is associated with creosote and saltbush. The general elevation range is 3,000 to 5,000 feet. Although habitat suitable for this species occurs within the Project area, no individuals of this species were located in 1999 or 2007.

3.10.1.5 Delicate Rockdaisy

The delicate rockdaisy species is rare and is known from the Pahrump Valley and Spector Range in Nye County. It occupies rock crevices, canyons, lower slopes, washes, and volcanic cliffs on limestone desert ranges. It is associated with saltbush, sagebrush, and pinion-juniper. It occurs at elevations ranging from 2,600 to 4,800 feet. No individuals of this species were observed on the Project area in 1999 and 2007.

3.10.1.6 Amargosa Penstemon

The Armargosa penstemon species is known to occur in Western Nevada and East San Bernardino County, California. It occupies dry, rocky places in sandy and gravelly washes and is associated with creosote bush scrub. General elevations range from 3,300 to 5,200 feet. No individuals of this species were observed in the Project area in 1999 and 2007.

3.10.1.7 Pahute Mesa Beard Tongue

Habitat for the Pahute Mesa beard tongue species is usually open areas of very loose soil and very rocky places among boulders and rock crevices. Elevations range from 5,800 to 7,500 feet in pinon-juniper woodlands or sagebrush shrublands. The Project area elevation is somewhat below the known range for this species and no individuals of this species were observed within the Project area in 1999 and 2007.

3.10.1.8 White Bearpoppy

The White bearpoppy is known to occur in the Death Valley region of California to Clark County, in Nevada. Habitat for this species is loose rocky soils in the creosote bush scrub at elevations ranging from 3,000 to 4,500 feet. No individuals of this species were observed within the Project area in 1999 and 2007.

3.10.1.9 Clokey Egg Vetch

Habitat for the Clokey egg vetch occurs on barren hillsides and bare places in canyons in the elevation range of 6,800 to 9,100 feet in sagebrush scrub and pinon-juniper. The Project area elevation is below the known range for this species and no individuals of this species were observed within the Project area in 1999 and 2007.

3.10.1.10 Half-Moon Milkvetch

Habitat for the Half-moon milkvetch occurs on rocky slopes in canyons or on cliff ledges composed primarily of limestone. Elevations range from 4,100 to 6,100 feet. These plants are known to occur in the Spring Mountains in Nevada. No individuals of this species were observed within the Project area in 1999 and 2007.

In summary, during the vegetation surveys conducted on the Project area between April 10 and April 14, 1999, and between July 26 and August 3, 2007, no sensitive plant species were observed. Another species of milkvetch, widow's locoweed (*Astragalus layneae*), was found on the northern edge of the Project area on the process-related site area between the proposed open pit site and the north waste dump. Widow's locoweed is a common perennial on the north Bare Mountains, Yucca Mountain, Bullfrog Hills, and Tolicha Peak in Nye County. A variety of cactus species were identified within the Project boundaries. All members of the Cactaceae family are protected by the State of Nevada (NRS 527.060-527.120).

Cacti identified within the Project boundaries included barrel cactus, beavertail cactus, cottontop cactus, hedgehog cactus, gold cholla, teddybear cactus, and buckhorn cholla.

3.10.2 Wildlife

A list of sensitive animal species that have potential to be present within the Project area was obtained from the Nevada Natural Heritage Program (NNHP), the BLM, and the United States Fish and Wildlife Service (USFWS). These species are listed in Table 3-9.

Table 3 - 9: Special Status Wildlife Species with Potential to Occur within the Project Area

Common Name	Scientific Name
Mojave desert tortoise	*Gopherus agassizii*
Banded gila monster	*Heloderma suspectum*
Chuckwalla	*Sauromalus obsesus*
Golden eagle	*Aquila chrysaetos*
Prairie falcon	*Falco mexicanus*
Peregrine falcon	*Falco peregrinus*
Mountain plover	*Charadrius mountanus*
Desert bighorn sheep	*Ovis Canadensis nelsoni*
Western pipistrelle	*Parastrellus hesperus*
California myotis	*Myotis californicus*
Yuma myotis	*Myotis yumanensis*
Pallid bat	*Antrozous pallidus*
Western red bat	*Lasiurus blossevillii*
Brazilian free-tailed bat	*Tadarida brasiliensis*
Amargosa toad	*Bufo nelsoni*

Source: Converse Consulting 1999 and Converse Consulting 2008.

3.10.2.1 Desert Tortoise

On April 2, 1990, the Mojave Desert populations of the desert tortoise were listed as threatened by USFWS. This is the only threatened species known to occur in the vicinity of the Project area. The designation of threatened indicates that the desert tortoise is likely to become endangered in the near future throughout all or a significant portion of its range. The tortoise is also listed as a rare and protected species by the Nevada Division of Wildlife (NDOW).

The Project area is located within desert tortoise habitat; and therefore, is subject to the *Biologic Opinion for the Reward Mine Plan of Operations, Nye County, Nevada* (File No. 84230-2008-F-0293.

The desert tortoise's range roughly approximates the creosote bush scrub community distribution. This includes but is not limited to the Mojave and Sonoran Deserts in southern California, southern Nevada, northwestern Arizona, the southwestern corner of Utah, and Sonora and northern Sinaloa, Mexico. There are two distinct populations of desert tortoise: the Mojave and the Sonoran. Although these populations are separated by their physical location with respect to the Colorado River (the Mojave population occurs north and west of the Colorado while the Sonoran occurs south and east); they are also morphologically, genetically, and behaviorally different. The Mojave population of the desert tortoise, which is federal and state listed, occurs over most of Clark County and in portions of Nye, Lincoln, and Esmeralda counties. The Mojave Population tortoises are primarily active between March and June, as well as September through October. During July, August and November through February, their inactive periods, tortoises rest in subterranean burrows or caliche caves, spending as much as 98 percent of their time underground hibernating or estivating, (Nagy and Medica 1986). Even during their active periods, they may spend nights and the hotter midday timeframe in their burrows. Tortoises construct and maintain a series of single-opening burrows, and may inhabit from seven to 12 burrows at a given time (Bulova 1994). Home ranges, or core areas, of tortoises overlap because they are not territorial. Home ranges can vary from ten to 450 acres and can be dependent on sex, age, season, and density or availability of resources (USFWS 1994). Tortoises tend to avoid core areas in plateaus, playas, sand dunes, and slopes greater than 20 percent. They also avoid obstacle ridden areas that restrict movement such as those with dense vegetation and rocky terrain. Since friable soils are important, tortoises tend toward areas characterized by scattered shrubs with abundant inter-space for herbaceous plant growth. Desert tortoises typically choose flats, valleys, bajadas, and rolling hills as habitat in Nevada, preferring 2,000 to 3,500 feet in elevation.

Desert tortoises eat a variety of perennial and annual plants, which include portions of some shrubs and cacti. Forage species selected by tortoises in the Mojave Desert include: desert wishbone bush (*Mirabilis bigelovii)*, dwarf white milkvetch (*Astragalus didymocarpus),* Layne's milkvetch (*Astragalus layneae)*, evening primrose (*Camissonia boothii),* hill lotus (*Lotus humistratus)*, Brightwhite (*Prenanthella exigua),* rattlesnake weed *(Euphorbia albomarginata).* They may also eat some carrion and their own scat (Jennings, 1997).

The habitat quality in and around the Project area appears to be of adequate quality. The Project area includes approximately 780 acres with approximately 50-60 percent potential desert tortoise habitat. The friable soils and vegetation present in this portion of the Project area are typical of desert tortoise habitat. The Project area is in a particularly low density tortoise area. No desert tortoises were observed during the 1999 survey and few desert tortoise sign were observed in the Project area during the 2007 survey. Most burrows were spotted across I-95, west of the Project (Converse Consultants 2008).

The documentation of sign in the area indicates that tortoises have previously and currently inhabit the area. The density of tortoises observed in the Project area indicates that the threats to tortoises in this area appear to be minor. It should be noted that the density is especially low in the Project area. This may be due to the rocky terrain, steeper slopes, and presence of Mojave Desert ravens. The rocky terrain and steeper slopes are not preferred habitat for this species. The ravens are predators to immature desert tortoises.

3.10.2.2 Banded Gila Monster

The Gila monster is considered by USFWS as a species of concern in Nevada, and is classified by the State as protected. The Gila monster is a large, secretive, heavy-bodied, venomous lizard with short limbs, massive head, and a large, thick tail. Its coloration is orange/yellow and black. Although the banded Gila monster lives in Mojave Desert scrub, its habitat is primarily canyon bottoms and/or arroyos with permanent to semi-permanent flow. In addition to their affinity to gravelly and sandy soils they are often found near water or moist soils underground in a burrow or under a rock. The Gila monster is diurnal, especially in the spring (Stebbins 1985). The Project area does not contain the appropriate habitat for banded Gila monsters, and no banded Gila monsters were found during surveys in 1999 and 2007 (Converse Consultants 1999, 2008).

3.10.2.3 Chuckwalla

The chuckwalla is listed as a species of concern by USFWS, a sensitive species by BLM, and is classified as a species of conservation priority by the State. The chuckwalla is a large, rock-dwelling heavy-bodied, herbivorous lizard, and is generally nocturnal. It is widely distributed throughout southern Nevada and can be found on nearly every rocky hillside, large outcrop, and rock escarpment in desert habitat. They are not often seen in daylight hours, during which they are usually wedged within rocky crevices. Two chuckwallas were observed in the Project area near the northern boundary of the proposed open pit during the 1999 survey (Converse Consultants 1999), but none were observed during the 2007 survey (Converse Consultants 2008).

3.10.2.4 Golden Eagle

Golden eagles are found throughout the state, with lower densities occurring in the southern desert areas. They nest primarily rugged canyons, cliffs, and mountains (Floyd et al. 2007), but hunt over a wide range of habitat types, including the desert scrub.

The Bare Mountains provide potential nesting habitat for this species, but no nests were observed within the Project area. The alluvial fan extending from the area of proposed pits to US 95 represents hunting habitat for golden eagles.

3.10.2.5 Prairie Falcon

Like the golden eagle, the prairie falcon is a bird of the rugged mountains, canyons, and cliffs. This species nests exclusively on rock ledges in remote locations. However, it forages over the adjacent valleys, often using the cliffs or rock ledges as perches from which to initiate a “stoop” or attack on prey.

The Bare Mountains provide suitable nesting habitat for this species, but no nests were observed within the Project area. The Project area represents hunting habitat for this species.

3.10.2.6 Peregrine Falcon

The peregrine falcon was probably never common throughout Nevada, but records of this species exist and observations in the Lake Mead area are not uncommon (Floyd et al. 2007). However, nesting of this species in Nevada is associated with a stream, lake, or wetland (Herron et al. 1985). Therefore, it is unlikely that this species would nest in the vicinity of the Reward Project, and none were observed during the field surveys.

3.10.2.7 Western Burrowing Owl

The western burrowing owl is classified as a BLM sensitive species and is protected by both the USFWS and NDOW under the Migratory Bird Treaty Act. The western burrowing owl is a small owl, nine to 11 inches in length, found in open country, and widely distributed throughout southern Nevada. The burrowing owl inhabits open grasslands, prairies, deserts, and farmlands, with nests in burrows in the ground. No burrowing owls were observed within the Project area during the wildlife surveys.

3.10.2.8 Desert Bighorn Sheep

Desert bighorn sheep are primarily grazers, consuming grasses sedges, and forbs, but will eat young twigs, leaves, and shoots when preferred food is scarce (especially in winter). Desert bighorns eat a variety of desert plants and get most of their moisture from the vegetation, although they still visit water holes every several days in summer.

When summer temperatures become extreme and water sources dry up completely, Desert bighorns rest most of the daylight hours and feed at night. During this season, they rely on certain desert plants for both food and moisture. They use their hooves and horns to remove spines from cacti, and then eat the juicy insides. They are fond of the tender shoots of prickly pear and cholla, and the flowers of succulents like agave and squawgrass.

Desert bighorn sheep are present within the Project area. One carcass was discovered during the 2007 survey. The specimen appeared to have died naturally. Additionally, there were two separate areas that appeared to be lambing sites, both located in T13S, R47E, Section 2 (Converse Consultants 2008). Bighorn sheep occupy the nearby mountain ranges adjacent to the Project area and have been observed during the NDOW annual bighorn sheep survey (Stevenson 1998). A guzzler for desert big horn sheep is located at T13S, R47E, Section 1, over one-half mile east of the Project area.

3.10.2.9 Bats

Potential cave analog bat roosting habitat within the Project area is limited to two mine shafts, the remains of mining at the Gold Ace Mine Complex, and other mine-related habitation remains near the north end of the Project area. One shaft, located in the area of the proposed heap leach facilities, is approximately 60 feet deep. The second shaft, located west of the proposed Southwest Dump, is shallow. The remnants of the historic Gold Ace mine, and an unidentified mine habitation, located between the proposed waste dumps on the east and the proposed Project haul roads on the west also represented limited, potential bat roosting habitat. These structures are in various stages of collapse and ruin, and represent temporary habitat. The shafts and structures were investigated for bat presence during the 2007 wildlife survey.

Substantial cliff and canyon habitat with suitable rock crevices and cave openings exists immediately adjacent to the Project area to the east and north. Because the adjacent cliff and canyon habitat to the east are not a part of the Project area, they were not surveyed for bats. However, this habitat represents suitable roosting habitat for Western red bat and Western pipistrelle, which do not use cave analogs.

Based on the interpretation of the recordings of bat vocalizations from the adits within the Project area, the bats were not exiting the adits, but were foraging in the area (Michael O'Farrell personal communication to Converse Consultants 2008). There was no indication that the bats observed (i.e., recorded) were residents of the historic mine workings. Bats observed during the 2007 survey include the Western pipistrelle, California myotis, Yuma myotis, Pallid bat, Western red bat, and Brazilian free-tailed bat. These bats were foraging individuals and not roosting individuals.

3.10.2.10 Amargosa Toad

The Armargosa toad is considered by USFWS as a species of concern in Nevada, by BLM as a sensitive species, and by NDOW as a State protected amphibian. The Armargosa toad is a chunky, short-legged, warty, tailless amphibian with parotoid glands similar to other western toads, but with a narrower head, long snout, and elbows and knees that do not touch when placed along its sides. This toad inhabits desert streams and springs and is found in the Armargosa River Valley near Beatty, Nye County, Nevada. Neither Armargosa toads nor their habitat was found during the wildlife survey conducted in the Project area.

3.11 WILD HORSES AND BURROS

The Project area is adjacent to the Bullfrog Herd Management Area administered by the BLM Tonopah Resource Area. No wild horses or burros were observed in the Project area; however, burros and wild horses have previously been inventoried in the area.

3.12 VISUAL RESOURCES

The BLM Las Vegas Field Office is separated into seven district areas in terms of scenic values. The Armargosa Valley area is found in the northwest portion of the district between Pahrump and Beatty. Most of the landscape is characterized by flat bajada type desert country with creosote bush communities and some minor hills and mountains. The eastern portion of the area borders the Nevada Test Site and exhibits colorful and rugged mountain ranges that break up the monotony of the valley floor.

Public lands are classified into Visual Resource Management (VRM) Classes based on visual resource quality and types of management activities appropriate for a given area. The Project area is located in a VRM Class III area. The management objective of a Class III area is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

The existing landscape is dominated by the Bare Mountains, a rugged, sparsely vegetated range of mountains. These mountains are characterized by the angular lines of the ridges and steep-sided canyons. A strong linear element is provided by the exposed geologic formations. The texture of the mountains is fine-grained due to the limited amount of vegetation. Colors of the mountains vary with the exposure to the sun, but are dominantly gray, with some reddish hues present in the lower foothills. The mountains give way abruptly to the alluvial valley.

The gently sloping valley floor is characterized by a creosote-cactus community. The large interspaces between plants and the variety of growth forms and plant heights contribute to the coarse-texture of the valley floor. Linear elements are also provided by the existing public access road to the area. The vegetation contributes green and yellow-green color to the landscape and the soil varies from gray to almost a pink hue.

3.13 SOCIOECONOMICS

The Project area is located in southern Nye County, Nevada. The nearest population center to the Project is the town of Beatty, located approximately eight miles north of the site. The small community of Amargosa Valley is located approximately 20 air miles southeast of the Project Area. The following sections describe the socio-economic environment of the area.

3.13.1 Population

Table 3-9 presents annual population estimates for Beatty, Armargosa Valley, and Nye County for the years 1980, 1990, 2000, 2005, and 2007. Nye County annual population estimates are also included for the same years.

Table 3 - 10: Population Data for Beatty, Amargosa Valley, and Nye County, Nevada

Location	1980	1990	2000	2005	2007
Beatty	740	1,623	1,152	1,032	1,059
Amargosa Valley	1,024	845	915	1,383	1,503
Nye County	9,048	17,929	32,978	41,302	46,308

Part of the apparent population fluctuations may be a result of the activity associated with the Yucca Mountain Project.

3.13.2 Employment

Employment in Nye County, Nevada, is heavily dependent upon the mining industry, but also centers around gaming, recreation, and the trade businesses (State of Nevada 1994). Table 3-10 presents annual average unemployment rates for Nye County and the State of Nevada.

Table 3 - 11: Unemployment Rates for Nye County and the State of Nevada

Location	1980-1990	1995	2000	2005	2006	2007	2008
Nye County	5.6%	4.6%	7.1%	5.9%	5.9%	6.9%	8.8%
Nevada	7.1%	5.4%	6.2%	4.3%	4.3%	4.7%	6.5%

3.13.3 Housing

Reward Mine contractors and employees would likely reside in either Beatty or Amargosa Valley. It is likely that employees could also reside in Pahrump. As of the 2000 Census, the following housing is available in Beatty:

- 173 single-family detached housing units;
- 8 single-family attached housing units;
- 430 mobile home residences;
- 97 multifamily housing units;
- 6 campground and RV facilities; and
- 5 hotels/motels (222 rooms).

In Amargosa Valley there are a total of 460 housing units.

3.13.4 Schools

The community of Beatty has an elementary school, a junior high school, and a high school. Amargosa Valley has one school, the Amargosa Elementary School, serving grades

kindergarten through eighth. All schools within Amargosa and Beatty are in Nye County School District. School enrollment and capacity figures are presented in Table 3-11.

Table 3 - 12: School Enrollment and Capacity for Beatty and Amargosa Valley Schools, Nye County, Nevada

School	Enrollment as of 2007-08	Capacity
Beatty Elementary/Middle School	108	320
Beatty High School	127	250
Amargosa Elementary/Middle School	179	n/a

3.13.5 Health Care Services

Health care services in Beatty are provided by the Nevada Rural Health Centers and supplied by the Beatty Medical Clinic which provides emergency care facilities, family medicine, women's health, pediatrics, D.O.T. physicals, occupational health, STD/HIV education and screening, family planning, urgent care and 24 hour emergency care, lab, x-ray, prescription dispensary, periodic screenings for kids and adults, well-child care and immunizations, prenatal and newborn care, chronic illness management, health education, and a Flight-for-Life to the Las Vegas Valley Hospital. The clinic is staffed with one physician, one physician's assistant, and two back office and two front office support staff. Medical personnel are on call 24 hours a day, even though they are not guaranteed available. A volunteer Emergency Medical Technician (EMT) service is also available in Beatty. The EMT service has one ambulance.

Health care services in Amargosa Valley are provided by the Nevada Rural Health Centers and supplied by the Amargosa Valley Medical Clinic which provides emergency care facilities, family medicine, women's health, pediatrics, D.O.T. physicals, occupational health, STD/HIV education and screening, family planning, urgent care and 24 hour emergency care, lab, x-ray, prescription dispensary, periodic screenings for kids and adults, well-child care and immunizations, prenatal and newborn care, chronic illness management, health education, and a volunteer ambulance service. The clinic is staffed with one MD, and two back office and one front office support staff.

3.13.6 Law Enforcement

Law enforcement in Beatty is provided by the Beatty substation of the Nye County Sheriff's Department and the Nevada Highway Patrol. Staff at the Beatty station includes one lieutenant, two deputies, five dispatchers, and three Highway Patrol officers. The dispatchers service the EMT service, the fire department, and the sheriff's department. A dispatcher is on duty 24 hours a day.

Law enforcement in Amargosa is provided by the Amargosa Valley substation for the Nye County Sheriff's Department. Staff includes three deputies and five dispatchers.

3.13.7 Fire Protection

Fire protection in Beatty is provided by the Beatty Volunteer Fire Department which is part of the Nye County Fire Department. Fire protection extends to an approximately twenty-mile radius in all directions around Beatty. The department has one pumper, one 4,400 gallon capacity tanker, one 1958 International reserve truck, and one fully-equipped rescue vehicle.

In Amargosa Valley, fire protection is provided by a volunteer two station fire department with 23 volunteer firefighters.

3.13.8 Water and Sewer

The Beatty Water and Sanitation District provides the water and sewer services to the community of Beatty. Barrick, operator of the Bullfrog Mine, donated a well to the town of Beatty, and a new pipeline has been installed to transport water from this well to Beatty.

Water in Amargosa Valley is provided by private wells. According to the Nevada Division of Water Resources, water rights within the Amargosa Valley are over-appropriated. However, by Nevada Law, single family domestic uses are guaranteed water rights (Robert Martinez, personal communication,1998).

3.13.9 Electrical Services

Valley Electrical Association provides the electrical services to the Beatty and Amargosa Valley communities.

3.14 HAZARDOUS MATERIALS

The proposed mining and ore processing operations would require the use of the following materials classified as hazardous:

- Diesel fuel, gasoline, oils, greases, anti-freeze, and solvents used for equipment operation and maintenance;
- Sodium cyanide, flocculants, lime, and antiscalants used in mineral extraction processes;
- Ammonium nitrate and high explosives used for blasting in the open pit; and
- Various by-products classified as hazardous waste and chemicals used in the assay laboratory.

Hazardous wastes generated at the Reward Mine would be transported by approved transporters to designated hazardous waste disposal facilities. All hazardous wastes would be stored, packaged, and manifested in compliance with applicable federal and state regulations.

3.15 HUMAN HEALTH AND SAFETY

The proposed Project includes operation of large equipment to haul waste rock and ore, use of blasting agents, creation of open pits, and use of hazardous materials. These conditions pose a public health and safety risk to the general public. The large haul trucks and other heavy equipment have limited visual range of people and objects near these vehicles. Combining general public traffic with mine traffic has high potential for serious accidents. The dumping of large quantities of blasted rock also poses a hazard to the general public on site. Boulders falling off haul trucks or rolling off waste rock dumps during dumping could result in serious injury. The mining process also includes the use of explosives to fracture bedrock. The blasting agents, detonator cord, and flyrock from the blasting process all pose hazards to the general public. The creation of open pits also creates a hazard for any members of the public that would wander onto the site. In addition, the mining process includes caustic, cyanide, and other chemicals that create health hazards for the general public.

4 ENVIRONMENTAL CONSEQUENCES

This section of the EA describes the direct and indirect impacts to the affected environment that have the potential to occur if the Proposed Action or Alternatives are implemented.

4.1 ENVIRONMENTAL CONSEQUENCES – PROPOSED ACTION

4.1.1 Access and Rights-of-Way

No rights-of-way would be impacted by the implementation of the Proposed Action. Public access to the canyon north of the Project and to Carrara Canyon would remain via the existing public access roads. The unnamed canyon due east of the Project is primarily on private land and would have restricted access during the life-of-mine due to public safety issues.

Impacts to the current land uses of mineral exploration and dispersed recreation would be slight. CRRC has proposed fencing, as necessary, for public safety and to prevent burros from entering the active mine area. Maintenance of public access to the unnamed canyon north of the mine site and to Carrara Canyon would allow dispersed recreation to continue in areas adjacent to the Project area.

The Elizalde Company Complex concrete factory ruins would remain accessible for future film ventures. Recent photographs of the ruins are included in Appendix C.

No direct impacts have been identified that would contribute to any cumulative effect for this resource.

4.1.2 Soils

Direct impacts to soils would result from the construction of the proposed open pit and other facilities. Total disturbance to soil resources from the Proposed Action would be approximately 287 acres. The displacement of soil would occur as proposed facilities are developed. As soils are collected, stored, and redistributed, the soil horizons would become mixed. This may result in changes in soil texture and permeability. In addition, changes in soil depth (difference from the original undisturbed soil depth) would occur. About 50 percent of Soil Unit 2301 in the area of the north and southwest waste rock dumps and open pit would not be salvaged due to restricted access on slopes in these areas.

Soil that is salvaged would be redistributed during reclamation of the mine facilities. While it may take decades or more for the soils to redevelop, the redistributed material will support plant growth which will reduce potential for erosion and non-native invasive plant establishment.

Direct impacts have been identified that would contribute to a cumulative effect for this resource.

4.1.3 Geologic Resources

Geologic and mineral resources within the Project area would be directly impacted by the relocation of approximately 6.8 million tons of processed ore and 13.98 million tons of waste rock. In addition, approximately 163,506 ounces of gold would be extracted from the gold bearing ore.

The Project is located in a low precipitation/high evaporation area. Therefore, drainage from infiltrating meteoric water through the waste rock dumps is not projected to occur. No groundwater or springs have been identified during reconnaissance and condemnation drilling in the entire Project area. In addition, the waste material to be mined from the Reward open pits demonstrates excess acid neutralizing potential, and MWMP tests indicated that secondary drinking water standards were only exceeded in basic range pH levels (pH values 8.86-9.05).

Consequently, other than long-term weathering of the exposed pit walls and waste rock, no acid rock drainage is anticipated.

Waste rock dumps and mine pit walls were designed in accordance with NDEP specifications for the regional climate cycles, storm conditions, and seismic activity. No impacts from seismic activity to the Project facilities are anticipated.

No scientifically important paleontological resources (i.e., invertebrate fossils) have been identified in the geologic formations in the immediate area of the Project; however, paleontological resources have been identified in the nearby Bare Mountain Range. There is low potential for direct impacts to previously unidentified scientifically important significant paleontological resources during mining operations, specifically from the development of the open pit. Direct and indirect impacts to paleontology are unlikely.

The removal of waste rock and ore from the pit areas would contribute to cumulative effects for this resource.

4.1.4 Air Quality

Direct impacts to air quality as a result of the Proposed Action would be localized and short term for the operational life of the Project (for approximately four to five years), and after mine closure during the period of time required for vegetation establishment(which is estimated to be three to five years). The potential impacts to air quality would result primarily from particulate emissions PM_{10} from the mining and ore processing operations. The Class II Air Quality Operating Permit places a cap on total PM_{10} emissions from the Project at 97.61 tons per year. The permit application estimates that the major source of PM_{10} would be from the crusher operation and associated conveyor systems to stack the ore on the heap leach pad. This is estimated at approximately 65 tons of emissions per year (Table 4-1) . Truck hauling of ore and waste, and wind erosion are the other primary emission sources. Emissions from ore processing would comply with Federal New Source Performance Standards for the metallic mineral processing industry.

Table 4 - 1: Estimated Emissions and Attainment Levels of Pollutants at Reward Mine (Stationary and Insignificant Activities)

Pollutant	Potential to Emit (pounds/hour)	Potential to Emit (tons/year)
Facility-Wide (Stationary Source)		
Total Particulate Matter (PM)	57.526	164.693
Particulate as PM_{10}	22.624	64.872
Sulfur Dioxide	0.103	0.449
Carbon Monoxide	0.334	1.463
Oxides of Nitrogen	1.550	6.789
Insignificant Activities (Portable Generator)		
Total Particulate Matter (PM)	0.110	0.50
Particulate as PM_{10}	0.110	0.50
Sulfur Dioxide	0.105	0.45
Carbon Monoxide	0.335	1.47
Oxides of Nitrogen	1.550	6.79
Volatile Organic Compounds	0.125	0.63

Sulfur dioxide (0.449 tons/year), carbon monoxide (1.463 tons per year), oxides of nitrogen (6.789 tons per year), and volatile organic compounds (0.550 tons per year) would be emitted from stationary sources at the mine (Table 4-1). These compounds are precursors to ozone formation, but no impacts to ozone are likely to occur due to the limited amount of emissions and the short-term period of Project activity.

There would be minor levels of particulate matter emitted during regrading and reclamation efforts as well as from disturbed areas until vegetation is established. The estimate of emissions from secondary activities include PM_{10} (0.50 tons/year), sulfur dioxide (0.45 tons/year), carbon monoxide (1.47 tons/year), oxides of nitrogen (6.79 tons/year), and volatile organic compounds (0.63 tons/year) (Table 4-1). These activities would occur in localized areas of the mine.

Ambient concentrations of PM_{10} are well below the 24-hour and annual PM_{10} National and State of Nevada Air Quality Standards provided in the Nevada Administrative Code (NAC 445B.391). The particulate emissions generated by the operation of the proposed Project should not impact the overall area air quality (i.e., should not result in exceedences of the National and State of Nevada Air Quality Standards). CRRC would implement BMPs, such as, but not limited to water sprays at conveyor transfer points, baghouses at crusher and screen locations, filter vents and water sprays at the lime silo, water application to roads and material being scraped or hauled, to minimize emissions.

Low levels of gaseous emissions would be associated with the operation of the construction and mining equipment. The above-ground fuel storage tanks (diesel and gasoline) would also produce some hydrocarbon emissions, but ambient concentrations of these gaseous air pollutants in the area are expected to be near background levels and well below National Ambient Air Quality Standards (NAAQS). Thus, the addition of gaseous emissions from the sources listed above should not impact the air quality.

Emissions from the mine operations would add to other local sources of emissions and would contribute to cumulative effects for this resource.

4.1.5 Cultural Resources

There will be no environmental consequences from the proposed action or the no action alternative to cultural sources within the proposed activity area. All eighteen historic sites that were formally identified, recorded, and evaluated within the boundaries of the disturbance area do not meet the Secretary of the Interior's criteria and have been determined not eligible for listing on the National Register of Historic Places (NRHP). No further management considerations prior to project implementation would be required.

As there are no National Register eligible historic properties identified, there would be no direct or indirect impacts that would contribute to any cumulative effect for this resource.

4.1.6 Native American Traditional Values

BLM initiated consultation with the Timbisha Shoshone Tribe on August 8, 2007 with a letter describing the Project and inviting the Tribe to comment on issues of concern to the Tribe. A site visit was arranged for September 26, 2007 at which time several tribal members toured the site and had the opportunity to raise and discuss issues.

With respect to impacts to the ecosystem, the impacts to various components of the ecosystem are discussed under the various sections of this chapter. Through the NEPA process, impacts to individual resources that are identified as non-significant do not require any mitigation or modification of the Project. NEPA also recognizes the temporary nature of some impacts or measures included in the Proposed Action intended to maintain ecological processes. This includes stormwater diversion channels to prevent runoff from contacting erosive materials and

to maintain flows and flow patterns to the extent possible, or stockpiling growth medium for future use in reclamation. While not a true ecosystem approach to the analysis, the end result is that impacts to the ecosystem which would substantially alter the ecosystem are either avoided or mitigated. Therefore, impacts are not likely to occur on an ecosystem level.

Impacts to water resources, both quality and quantity, are discussed in Section 4.1.7. Of specific concern were impacts to the basin aquifer from which the Native American community and the Trust Lands at Death Valley Junction acquire their water. As indicated in Section 4.7, the groundwater drawdown resulting from the proposed water use at the Project (approximately 93.42 million gallons annually) would be localized near the pumping well due to the quantity of water to be used and the short period of use. No other water users are close enough to the pumping well to be impacted. No springs or discharge areas are within the area of drawdown. Consequently, there should be no impacts to the Native American community or the Trust Lands at Death Valley Junction. Cumulative effects of the water use in the basin are addressed in the Cumulative Effects section.

With respect to the longevity of the Project, the current plan includes mining for four to five years (ore removal and processing) with three to five years for reclamation and closure activities. Continued exploration could result in additional ore being located, which would require permit modification to allow additional mining.

A comment letter was received from the Timbisha Shoshone Tribe following their review of the EA (Appendix F), which reiterated the concerns that they had previously voiced.

No direct impacts have been identified that would contribute to any cumulative effect for this resource.

4.1.7 Water Resources

4.1.7.1 Water Quality

No perennial surface water resources exist within the immediate vicinity of the Project area. Amargosa Narrows and Specie Spring, located approximately five miles northwest and three miles northeast of the Project area respectively, are the nearest surface water resources. The springs in Amargosa Narrows lay upgradient from the Project area, while Specie Spring is topographically isolated from the Project area by the Bare Mountains. Therefore, it is not possible for stormwater run-off from the Project to impact these spring areas.

Although unlikely, stormwater run-off from the mine site could reach the Amargosa River. Impacts to the Amargosa River are not anticipated because surface flow at the mine site would be controlled and channeled to prohibit surface run-off from leaving the property. Diversion and sedimentation structures, as needed, would be designed to handle the 100-year, 24-hour storm event.

Residual impacts to permanent surface water resulting from the Proposed Action are not likely due to the distance and topographic isolation of the existing springs. Reclamation that would be performed following mine closure would further reduce any potential for impact. Diversion ditches and detention basins would be revegetated as part of reclamation. These ditches would remain as a post-mining land feature to control surface flow which may result from storm events.

Subsurface exploration drilling within the Project area has not encountered the groundwater of the carbonate or the basin fill aquifers. No perched water has been encountered on site. Based on the data presented in Section 3.7.2 of this EA, the development of the Reward Pit would not intercept the groundwater of any known aquifer.

The waste rock dumps would be located approximately 1,200 feet above the groundwater table. Waste rock characterization does not indicate a potential for the leaching of contaminants from

the waste rock. NDEP guidelines suggest that any material with an AGP/ANP ratio of less than 1.2 may be potentially acid generating. All of the waste rock units tested to date have an AGP/ANP of 3.0 or greater, with the exception of two small samples of the Sterling Formation. These two samples appear to be anomalies that are associated with local mineralized zones. Therefore, acid generation from Reward Project waste rock is unlikely. The Project is located in a low precipitation/high evaporation area. Therefore, drainage from infiltrating meteoric water through the waste rock dumps is not projected to occur. No groundwater or springs have been identified during reconnaissance and condemnation drilling in the entire Reward Project area.

Therefore, no degradation of the groundwater is anticipated from the construction or location of the waste rock dumps.

The groundwater table is estimated to be in excess of 1,200 feet bgs in the pit area (See Figure 2-5). The potential for impacts to the groundwater from run-off is low due to low and annual precipitation rate (less than five inches annually), the natural attenuation of the alluvial material, and the high evapotranspiration rate (approximately 75 inches per year) from the site.

The heap leach pad would be lined to maintain containment of process fluids. The temporary closure plan indicates that achievement of stability criteria would include a demonstration that meteoric waters contacting the stabilized spent ore have no potential to degrade the Waters of the State.

4.1.7.2 Water Budget

The proposed water well for the Reward Project would be located approximately two miles southwest of the mine near Highway 95. The water well would be completed in the alluvial aquifer. Water would be used to supply the Project for a period of six to seven years of planned gold production, with a maximum groundwater pumping of 93.42 million gallons annually (mga). A regional impact analysis of the supply well was conducted by John Shomaker and Associates, Inc. (Jones 2008) using the regional numerical groundwater-flow model of the Death Valley Basin (D'Agnese et al. 2002). The analysis was conducted on a regional scale to describe impacts of the water pumping to the water balance of the Amargosa Basin.

The regional analysis indicated that the historic groundwater balance[2] of the Amargosa Basin is primarily a result of groundwater inflow from neighboring basins (approximately 12,660 mga), recharge and injection (1,616 mga), and groundwater storage depletion (7,811 mga). Outflows included groundwater outflow to neighboring basins (7,135 mga), groundwater discharge (6,651 mga), and groundwater pumping (8,320 mga). The Reward Project would add an additional 93.42 mga of groundwater pumping and the nearby U.S. Ecology site pumps six mga. The relatively small magnitude of the proposed groundwater pumping for Reward Project and the short duration of the pumping suggests that any measurable impacts would be confined to the immediate vicinity of the pumping well. Impacts at distance would be highly attenuated in space and time (Jones 2008).

Model-simulated water-table drawdown (drawdown in the uppermost model layer) resulting from the Reward Project and U.S. Ecology after six years of pumping (end of mining) indicates that a drawdown of 0.5 ft. or greater is confined to a two-mile radius of the mine, reaching about eight ft. near the Reward Project well (Figure 4-1). Drawdown near the U.S. Ecology well reaches about 0.5 ft. (Jones 2008).

[2] *Figures are based on 1998 water balance simulation, the most recent water balance analysis conducted, which simulated the period 1912 to 1998. The model was extended by approximating groundwater pumping for the period 1999 to 2008, and the projected future pumping with and without the Reward Project and U.S. Ecology (Jones 2008).*

The numerical model predicts no effects to groundwater discharge during or after the six-year life of the Project. Instead, groundwater drawdown of decreasing magnitude would continue to propagate away from the Project area while water levels at the Project site recover. Any future effects to groundwater discharge would be too attenuated for the model to quantify.

The effects of the Project to the Amargosa Basin water balance is illustrated in Figure 4-2. During the Project pumping, groundwater pumping would be matched by depletion of the aquifer storage. Following the cessation of pumping, the refilling of the aquifer storage near the Project site is supplied by depletion of the storage farther away. Predicted groundwater drawdown due to the Project 80 years after the end of the water pumping would result in a maximum drawdown of 0.3 ft near the well and a drawdown of 0.2 ft occurring up to 5.8 miles from the well. Drawdown of 0.1 ft would occur up to 6.6 miles from the well (Figure 4-3).

No other water users are close enough to the proposed pumping well to be impacted. No impacts to the Native American community and the Trust Lands at Death Valley Junction would occur due to the distance from the Project. No springs or discharge areas are close enough to the Project to be impacted. Instead of depleting the groundwater discharge, the long-term impact of the Project would be a zone of semi-permanent groundwater drawdown of a fraction of a foot. Any impacts to discharge would be effectively zero due to attenuation of groundwater drawdown over a large area (Jones 2008).

4.1.7.3 Waters of the United States

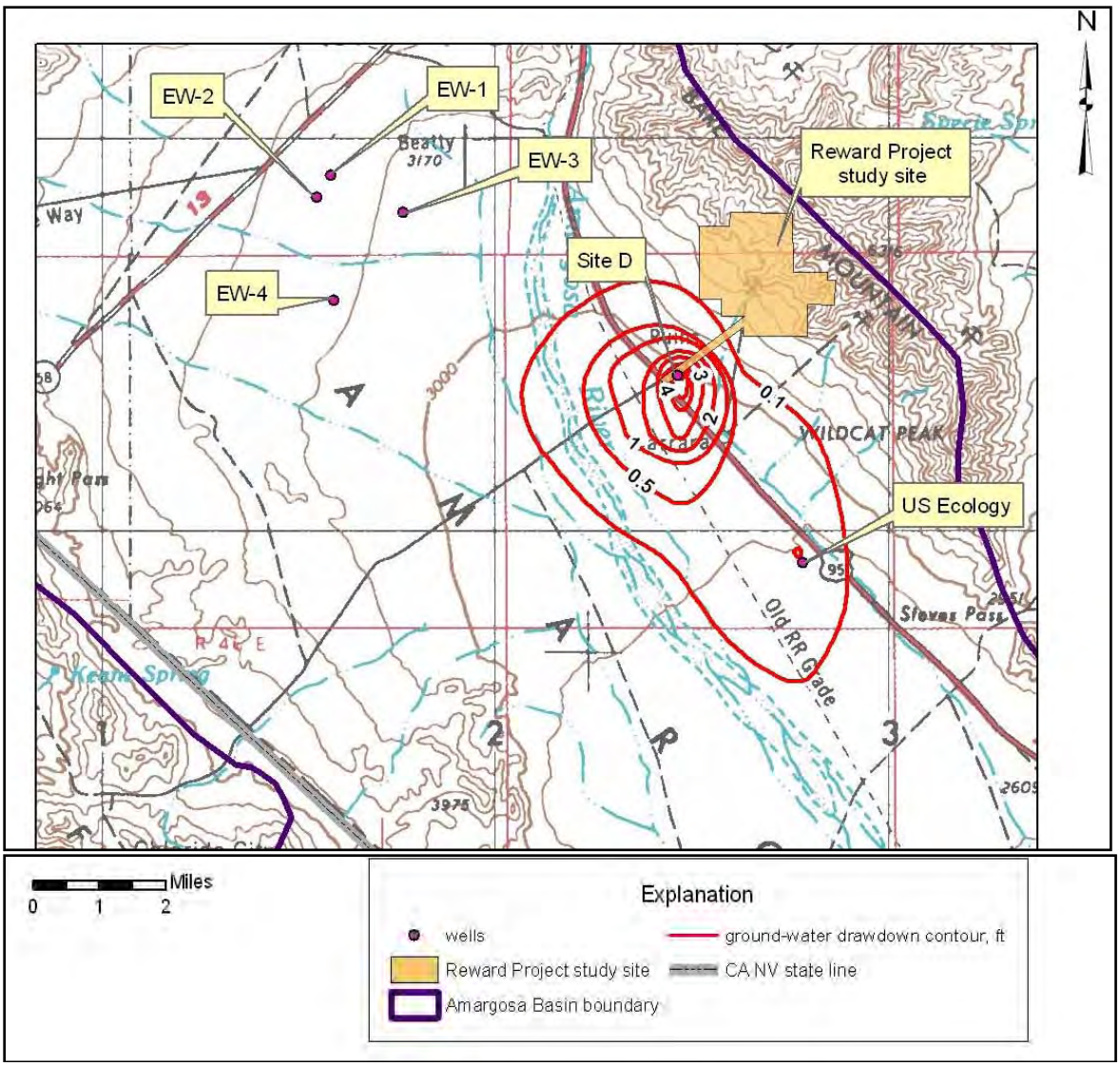
Because no riparian/wetland areas occur within the Project area, or within the predicted zone of water drawdown from the water supply well, no impacts to Waters of the U.S. (WOUS) would occur from the Proposed Action.

Approximately 0.727 acres of jurisdictional ephemeral washes would be filled by the Proposed Action and include the following:

- Approximately 0.176 acres of a wash at the north end of the access road to the Good Hope portion of the Reward Pit; and
- Approximately 0.551 acres of a wash in the southern portion of the Project associated with the heap leach pad.

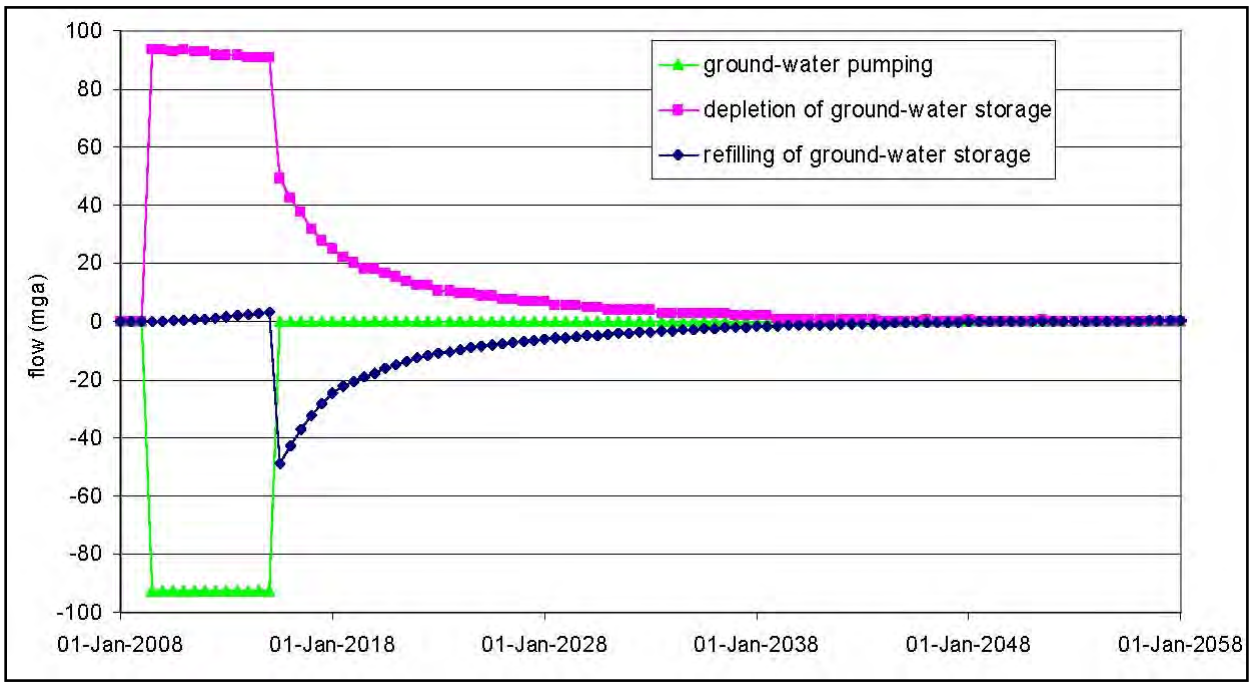
The ephemeral wash at the north end of the Project area would not be impacted by the Proposed Action. The flows in these washes do not normally reach the Amargosa River, but instead infiltrate into the alluvial terraces. The Proposed Action would not prevent the infiltration of the flow into the alluvial basin, but would route the runoff from the mine facilities to sediment basins, which would divert the flow from the mine area and up-gradient of the mine area from the jurisdictional washes to the Amargosa River.

Removal of ground water from the alluvial aquifer would contribute to cumulative effects for this resource.



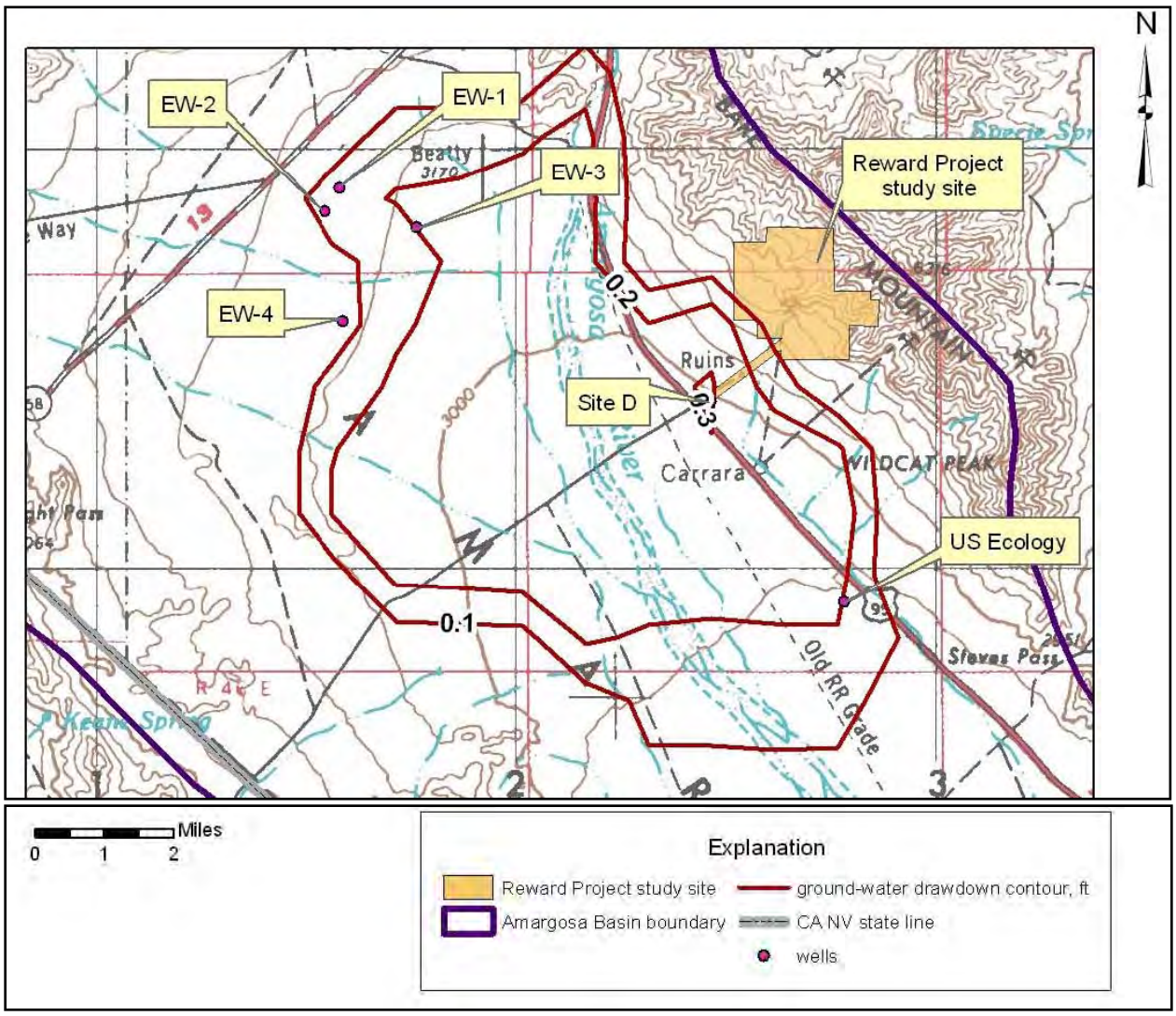
Source: Jones 2008

Figure 4 - 1: Map of Reward Project Area Showing Model-Simulated Groundwater Drawdown after Six Years of Pumping



Source: Jones 2008

Figure 4 - 2: Graph Showing Model-Simulated Impact of Project Pumping on the Amargosa Basin Water Balance



Source: Jones 2008

Figure 4 - 3: Map of Reward Project Area - Simulated Groundwater Drawdown 80 Years After the End of Pumping

4.1.8 Vegetation

4.1.8.1 Vegetation

The direct impact to vegetation would be the disturbance of approximately 287 acres of creosote bush desert scrub and mixed desert shrub vegetation within the Project area. State-protected cacti are located throughout the Project area. It is unlawful to cut, destroy, mutilate, remove, or possess any cactus from any of the lands owned by or under the jurisdiction of the State of Nevada or its counties (NRS 527.100). The environmental protection measures included in the Proposed Action provide for representative numbers of cacti species in the area of proposed disturbance to be removed and transplanted prior to surface disturbance. Upon completion of the earthwork and seeding portions of the reclamation plan, these cacti would be transplanted to suitable reclaimed surfaces. It is likely that some mortality of cacti would occur during these transplanting activities. However, with proper precautions, the impact can be kept minimal. Mitigation for impacts to the plants is detailed in Section 4.4.

Disturbance would occur over the life of the mine. As facilities are constructed, concurrent reclamation would be initiated as practicable. Upon cessation of mining activities, growth media would be redistributed over disturbed areas, followed by seeding with an approved seed mix. Plant species used in the seed mix may result in a slightly different vegetation community until natural volunteer seeding of the area by species from surrounding, undisturbed areas become established. Due to the poor quality and limited quantity of soils in the Project area for reclamation, revegetation may not be successful. Mitigation for this impact is provided in Section 4.4.

4.1.8.2 Noxious Weeds

While no noxious weeds were observed during the field surveys (Converse 2007), tamarisk has potential of establishing at the mine wherever soil remains moist. This could occur along freshwater lines, pumping stations, pressure tanks, or stormwater sediment ponds. A noxious weed risk assessment was conducted (Appendix D) and the risk of noxious weed establishment is low; however, monitoring of the Project is required to provide early detection and treatment of noxious weeds on disturbed areas or areas where moist soils would occur (See Appendix D, Noxious Weed Contingency Plan).

Direct impacts to vegetation have been identified that would contribute to cumulative effects for this resource.

4.1.9 Wildlife

Project construction activities would result in the modification of surface soil properties, existing vegetation, natural topography, and the displacement of the majority of wildlife species inhabiting the Project area. Most wildlife species have the capability of evacuating the Project area when mining processes are initiated. Mortality among species of reptiles and rodents is expected during initial mine grading activities on the Project area.

4.1.9.1 Mammals

Some mortality of small mammals, such as kangaroo rats, pocket mice, and antelope ground squirrels, would occur during mining activities on the Project area. Large mammal species such as jackrabbits, coyotes, and kit foxes, would likely evacuate the Project area when mining activities begin. It is unlikely that larger mammals would be physically harmed during construction unless occupied burrows are crushed. Therefore, direct impacts to mammals would be limited to smaller, less mobile species.

Indirect impacts would result from the temporary loss of 287 acres of habitat over the four to five years of active mining and three or more years of closure activities. Following closure, there would be permanent loss of 48 acres of habitat represented by the open pit areas. This would be a change in habitat for small mammals, but the pit high walls may provide roosting habitat for several bat species that would not otherwise inhabit the Project area.

4.1.9.2 Birds

The majority of birds occupying or using the Project area would disperse once mining activities begin and habitat is removed. It is likely that no bird mortality (i.e., no direct impacts) would occur as a result of the mining activity during late winter and early spring months prior to bird nesting. Removal of vegetation at this time would not interfere with nesting or breeding activities.

Vegetation removal during the avian nesting season would have the potential to have a direct impact on active nests with eggs or young. Such impacts would be a violation of the Migratory Bird Treaty Act. However, the environmental protection measure included in Section 2.2.9 would

only permit surface disturbance during the avian breeding season in areas that have been surveyed for active nesting behavior, for active nests, and where such surveys determine that avian nests are not present. This environmental protection measure would prevent any violation of the Migratory Bird Treaty Act, and no direct impact to migratory birds would occur.

While most of the bird species that were observed within the Project area would experience indirect impacts due to the removal of the vegetation within the mine footprint, rock wrens, white-throated swifts, and cliff-nesting raptors would experience an increase in nesting habitat following the cessation of mining as the result of creation of cliff analogs (i.e., pit high walls). Raptors have been observed nesting in inactive mine pits, and even within some active pits, in Nevada. Rock wrens use the crevices in the high walls and the rock debris on the benches for nesting. White-throated swifts also nest in rock crevices.

4.1.9.3 Reptiles and Amphibians

Impacts to lizards and snakes would depend on the time of year during which mining activities are initiated. Under warm weather conditions, reptiles are active and able to flee areas of mining activities. The most serious impact to reptiles would be due to the temporary loss of habitat and the destruction of shelters and burrows. The open pit area would represent a permanent loss of 48 acres of habitat.

As discussed in Chapter 3, neither amphibians nor amphibian habitat were observed during the site wildlife survey. Project mining operations are expected to have no impact on amphibians.

Disturbance of 287 acres of habitat would contribute to cumulative effects for this resource.

4.1.10 Special Status Species

4.1.10.1 Plants

No special status plant species were observed on the Project area during the survey. Therefore, no impacts to any special status plant species are anticipated due to the implementation of the Proposed Action.

4.1.10.2 Wildlife

Desert Tortoise

The Mojave Desert tortoise is the only USFWS listed species with the potential to occur within the Project area. Development of the Project would result in the eventual removal of 182 acres of possible tortoise habitat. The proposed pre-construction clearance and relocation of tortoises to nearby areas outside disturbance boundaries would reduce the direct take of individuals to the greatest extent practicable. However, not all tortoises would be found during clearance surveys and there is potential for direct impact to tortoises during construction of the Project or during normal site activities.

Tortoise fencing around the Project area during construction and operation activities would ensure relocated and nearby tortoises do not enter the Project area following clearance and construction initiation. The fencing would reduce or eliminate potential for tortoises to be crushed by vehicles due to increased traffic to and through the area. Any incidental trash not contained in fenced or covered trash container could potentially increase the raven population in the area, and consequently predation on tortoises.

Indirect impacts may also occur from mining activities, construction noise, and increased vehicle vibration and noise. There is a potential for tortoises in the Project area to be temporarily displaced due to this increase in disturbance. Once mining activities are completed, these individuals would likely return to their original habitat. Project conservation measures would help reduce overall impacts to the local desert tortoise population, but all impacts would not be

eliminated. Cumulative impacts to desert tortoise from Projects that occur in their habitat are potentially high. As land use in previously undisturbed habitat increases, so does the number of desert tortoises killed by the intrusion. The available habitat for desert tortoises is thereby reduced and indirect impacts from increased traffic, noise, pollution, and to the ecosystem is apparent. However, south of the Project area in nearby Clark County, the Clark County Desert Conservation Plan includes provisions that have set aside several contiguous pieces of land that are presumably large enough to sustain a healthy desert tortoise population in southern Nevada. Therefore, the cumulative impact would not jeopardize the continued existence of the species.

The Biological Assessment submitted to USFWS and the Biological Opinion issued by the USFWS concluded that the implementation of the Proposed Action is not likely to jeopardize the continued existence of the threatened desert tortoise (Mojave population). This determination is based on compliance with the Terms and Conditions of Biological Opinion (File No. 84320-2008-F-0293). To avoid or mitigate adverse habitat affects to the desert tortoise because of the proposed Project, CRRC shall adhere to the following:

The Service believes that the reasonable and prudent measures (RMPs) below are necessary and appropriate to minimize take of desert tortoise. In order to be exempt from the prohibitions of section 9 of the Act, BLM must ensure full compliance with Terms and Conditions, which follow and implement the RPMs below.

RPM 1: *BLM, or other jurisdictional Federal agencies as appropriate, shall ensure implementation of measures to minimize injury and mortality of desert tortoise as a direct or indirect result of Project activities including capture and handling of desert tortoises.*

Terms and Conditions:

1.a. An appropriate number of authorized desert tortoise biologists and monitors as determined by BLM shall be hired for the Project. All tortoise biologists shall comply with the Service-approved handling protocol (Desert Tortoise Council 1994, revised 1999). Authorized biologists shall ensure that all monitors associated with the Project are skilled and experienced to a level that ensures they are capable of successfully implementing the protective measures (Terms and Conditions) of this Biological Opinion. Potential authorized biologists shall complete the Qualifications Form (Attachment 2) and submit it to the Service for review and approval as appropriate. Allow 30 days for Service review and response. In addition, all biologists and monitors must be familiar with the Terms and Conditions of the Biological Opinion.

1.b. Prior to initiation of construction, an authorized biologist or monitor shall present a desert tortoise awareness program to all personnel who will be onsite, including but not limited to contractors, contractors' employees, supervisors, inspectors, and subcontractors. This program will contain information concerning the biology and distribution of the desert tortoise and other sensitive species, their legal status and occurrence in the Project area; the definition of "take" and associated penalties; the Terms and Conditions of this Biological Opinion; the means by which employees can help facilitate this process; responsibilities of workers, monitors, and biologists; and reporting procedures to be implemented in case of desert tortoise encounters or non-compliance with this Biological Opinion. The name of every individual trained will be recorded on a sign-in sheet. Each trained individual will be given evidence indicating they have received this training and will keep that evidence with them at all times when they are in the Project area.

1.c. Permanent tortoise-proof fencing shall be installed around the Reward Project area as shown in Figure 2 prior to any surface-disturbing activities to ensure effects are minimized to the maximum extent possible. All surface-disturbing activities associated with the

mining operations shall occur inside this fence. If fence construction occurs March 1 through October 31, an authorized tortoise biologist shall be onsite during construction of the tortoise-proof fence to ensure that no tortoises are harmed. If the fence is constructed November 1 through February 28/29, a biologist shall thoroughly examine the proposed fence line and burrows for the presence of tortoises no more than three days before construction commences. Fence construction shall follow the Service's recommended specifications for desert tortoise exclusion fencing (Attachment 3).

The tortoise-proof fencing shall be inspected on a daily basis during construction activities and at least on a quarterly basis following construction to ensure zero ground clearance. Any repairs or cleaning shall be completed within 72 hours from March 1 through October 30, and within seven days from November 1 through February 28/29. Monitoring and maintenance shall include regular removal of trash and sediment accumulation, and restoration of zero ground clearance between the ground and the bottom of the fence, including re-covering the bent portion of the fence if not buried.

1.d. Any desert tortoises or eggs found in the fence line shall be relocated offsite by an authorized tortoise biologist in accordance with the Service-approved protocol (Desert Tortoise Council 1994, revised 1999). If a desert tortoise is encountered within the fenced area and is in imminent danger, Project activities in the area shall cease until the desert tortoise is moved out of harm's way by an authorized biologist onto nearby BLM land. Tortoise burrows that occur immediately outside of the fence alignment that can be avoided by fence construction activities shall be clearly marked to prevent crushing.

1.e. An authorized tortoise biologist(s) shall conduct desert tortoise clearance surveys inside the fenced Project area prior to the start of surface-disturbing activities. The Project area shall be surveyed for desert tortoise using survey techniques that provide 100 percent coverage. The entire area will be searched three times unless no tortoises are seen during the second survey. All desert tortoise burrows, and other species' burrows that may be used by tortoises, shall be examined to determine whether the burrow is occupied by desert tortoises. Tortoise burrows shall be cleared of tortoises and eggs in accordance with the Terms and Conditions 1.f., 1.g. and 1.h. below, and collapsed.

1.f. All desert tortoises and desert tortoise eggs will be relocated 300 to 1,500 feet into adjacent, undisturbed habitat on nearby BLM land. A pair of new, disposable latex gloves will be used for each tortoise that must be handled. After use, the gloves will be properly disposed. Tortoises found aboveground will be placed under a marked bush in the shade. A tortoise located in a burrow will be placed in an existing unoccupied burrow of the same size and orientation as the one from which it was removed. If a suitable natural burrow is unavailable, an authorized biologist will construct one of the same size and orientation as the one from which it was removed. The construction method will adhere to the protocol for burrow construction (Desert Tortoise Council 1994, revised 1999). Any tortoise found within one hour before nightfall will be placed individually in a clean cardboard box and kept overnight in a cool, predator-free location. To minimize stress to the tortoise, the box will be covered and kept upright. Each box will be used only once and will then be discarded. The tortoise will be released the next day in the same area from which it was collected and placed under a marked bush in the shade.

1.g. All burrows found within areas proposed for disturbance, whether occupied or vacant, will be excavated by an authorized biologist and collapsed or blocked to prevent occupation by desert tortoises. All burrows will be excavated with hand tools to allow removal of desert tortoises and/or desert tortoise eggs. All desert tortoise handling and burrow excavations,

including nests, will be conducted in accordance with the Service-approved protocol (currently Desert Tortoise Council 1994, revised 1999).

1.h. Desert tortoises shall be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (*e.g.*, gaping, foaming at the mouth, *etc*.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises shall be kept shaded at all times until it is safe to release them. No desert tortoise shall be captured, moved, transported, released, or purposefully caused to leave its burrow for whatever reason when the ambient air temperature is above 95ºF. Ambient air temperature shall be measured in the shade, protected from wind, at a height of 2 inches above the ground surface. No desert tortoise shall be captured if the ambient air temperature is anticipated to exceed 95ºF before handling and relocation can be completed. If the ambient air temperature exceeds 95ºF during handling or processing, desert tortoises shall be kept shaded in an environment that does not exceed 95ºF and the animals shall not be released until ambient air temperature declines to below 95ºF.

1.i. All vehicular traffic shall be restricted to fenced areas and existing access road. A speed limit of 20 miles per hour shall be enforced. Speed limit signs and caution signs indicating the presence of desert tortoises will be posted at the beginning of the access road and haul road.

1.j. Project personnel shall exercise caution when commuting to the Project area and obey speed limits to minimize any chance for the inadvertent injury or mortality of species encountered on roads leading to and from the Project site. All desert tortoise observations, including mortalities, shall be reported directly to an authorized desert tortoise biologist and the Service.

1.k. All fuel, transmission or brake fluid leaks, or other hazardous materials shall not be drained onto the ground or into ephemeral washes or drainage areas. All petroleum products and other potentially hazardous materials shall be removed to a disposal facility authorized to accept such materials. Waste leaks, spills or releases shall be reported immediately to BLM. BLM or the Project proponent shall be responsible for spill material removal and disposal to an approved off-site landfill. Servicing of construction equipment will take place only at a designated area. All fuel or hazardous waste leaks, spills, or releases will be stopped or repaired immediately and cleaned up at the time of occurrence. Service and maintenance vehicles will carry a bucket and pads to absorb leaks or spills.

1.l. Water application shall avoid pooling of water on roadways. Pools of water may act as an attractant to desert tortoises.

1.m. All desert tortoises observed within the Project area or access road shall be reported immediately to the authorized biologist. The biologists shall halt activities as necessary to avoid harm to a desert tortoise. Project activities that may endanger a desert tortoise shall cease until the desert tortoise moves out of harm's way or is moved out of harm's way by an authorized desert tortoise biologist.

1.n. Any tortoise injured as a result of the proposed Project shall immediately be transported to a qualified veterinarian and reported to the Service's Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230.

RPM 2: *BLM, or other jurisdictional Federal agencies as appropriate, shall ensure implementation of measures to minimize predation on tortoises by ravens or other desert tortoise predators attracted to the Project area.*

Terms and Conditions:

2.a. Trash and food items shall be promptly disposed in predator-proof containers with resealing lids. Trash containers will be emptied daily, and waste will be removed from the Project area and disposed in an approved off-site landfill. Construction waste will also be removed from the site each day and properly disposed.

2.b. Reward Gold Mine shall report any observations of raven predation on desert tortoises in the Project area to BLM or the Service.

RPM 3: *BLM, or other jurisdictional Federal agencies as appropriate, shall ensure implementation of measures to minimize loss and long-term degradation and fragmentation of desert tortoise habitat, such as soil compaction, erosion, crushed vegetation, or introduction of non-native invasive plants or weeds as a result of Project activities.*

Terms and Conditions:

3.a. All Project personnel shall be instructed that their activities must be confined to fenced or designated areas. Cross-country travel outside designated areas is prohibited.

3.b. To the greatest extent possible, stockpile sites, turn around areas, overnight parking, and staging areas shall be located on previously-disturbed areas.

3.c. Remuneration fees shall be deposited into the Desert Tortoise Public Lands Conservation Fund (account number 730-9999-2315) (Section 7 Account) for compensation of the loss of desert tortoise habitat as a result of the proposed Project. BLM shall require a receipt of payment from the Project proponent, prior to the start of construction.

The proposed Project fence will exclude desert tortoises from 406 acres of suitable tortoise habitat; 182 of the 406 acres will be disturbed long-term and 224 acres may be temporarily disturbed throughout the life of the Project. Remuneration fees will be paid at the current rate. Information on the CPI-U can be found on the internet at:

http://stats.bls.gov/news.release/cpi.nws.htm.

Clark County serves as the administrator of the funds, but does not receive any benefit from administering these funds. These funds are independent of any other fees collected by Clark County under the Multiple Species Habitat Conservation Plan. None of these funds shall be used to develop a habitat conservation plan.

The payments shall be accompanied by the attached Section 7 Fee Payment Form and completed by the payee. The Project proponent or applicant may receive credit for payment of such fees and deduct such costs from desert tortoise impact fees charged by local government entities. Payment shall be by certified check or money order payable to Clark County and delivered to:

Clark County Desert Conservation Program
Dept. of Air Quality and Environmental Management
Clark County Government Center
500 S. Grand Central Parkway, first floor (front counter)
Las Vegas, Nevada 89106

(702) 455-3536

3.d. All appropriate measures for controlling noxious weeds shall be implemented as determined by BLM under the Las Vegas Field Office Noxious Weed Plan. This shall include controlling noxious weeds by washing vehicles and equipment with high pressure prior to mobilizing to the Project area, providing onsite personnel with BLM weed identification

information, and controlling noxious weeds should they be introduced as a result of the proposed action.

3.e. All temporary disturbance areas shall be restored in compliance with BLM's Las Vegas Field Office's restoration plan. Cacti and yucca will be salvaged prior to surface-disturbance and stockpiled in an onsite nursery for use in the restoration effort.

3.f. All fuel, transmission or brake fluid leaks, or other hazardous waste leaks, spills, or releases shall be reported immediately to the designated environmental supervisor. The environmental supervisor shall be responsible for spill material removal and disposal to an approved offsite landfill, and if necessary, will notify the appropriate Federal agency. Servicing of construction equipment will take place at a designated area on privately-owned lands.

RPM 4: *BLM, or other jurisdictional Federal agencies as appropriate, shall ensure implementation of measures to ensure compliance with the reasonable and prudent measures, terms and conditions, reporting requirements, and reinitiation requirements contained in this biological opinion.*

Terms and Conditions:

4.a. An authorized biologist shall record each observation of handled desert tortoises. Data will be collected, including: location, date, time of observation, whether the tortoise was handled, the general health of the tortoise, whether it voided its bladder, the location the tortoise moved from and the location it moved to, and any unique physical characteristics. The authorized biologist shall also include the names of all monitors approved for the Project, and the activities and level of involvement during the Project.

4.b. The Project proponent shall designate an individual who will be responsible for overseeing compliance with protective stipulations for the desert tortoise and for coordinating compliance. The designated individual will have the authority to halt activities of construction equipment that may be in violation of the stipulations, and will coordinate **directly** with BLM and the Service. BLM shall provide a copy of the Terms and Conditions of this Biological Opinion to designated individual as well as biologists and monitors for the Project. The Project proponent will prepare a report for BLM and the Service no later than 90 days after completion of construction within desert tortoise habitat. The report will make recommendations for modifying or refining the stipulations, and include the actual acreage of habitat disturbance caused by crushing and blading versus the estimates prior to construction.

Banded Gila Monster

This species was not present and habitat for this species was not present within the Project area. Therefore, no impacts to this species would occur as the result of the implementation of the Proposed Action.

Chuckwalla

This species was observed within the Project area during the 1999 field surveys, but not in the 2007 field surveys. Therefore, there is potential for indirect impacts through removal of habitat for this species during the life-of-mine and a permanent loss of approximately 48 acres represented by the pit areas.

Golden Eagle

Indirect impacts to the golden eagle would occur through the temporary removal of 287 acres of foraging habitat. This impact would occur on only a small portion of the available foraging area within the Amargosa Valley. Following the cessation of mining, approximately 239 acres of disturbance would be reclaimed and once again provide foraging habitat for this species;

therefore, there would be no reason for golden eagles to abandon the area. No direct impacts would occur to this species.

The creation of a high wall in the pit area would create potential nesting habitat for this species at the cessation of mining.

Prairie Falcon

The only BLM migratory species of concern known to inhabit the general area of the Reward Project is the prairie falcon. Nesting habitat for this species does not occur within the Project boundary, but is likely to occur in the Bare Mountains to the east of the Project. The Project would result in removal of approximately 287 acres of foraging habitat for this species. Given the large expanse of the Amargosa Valley, this indirect impact would be to only a small portion of the available foraging habitat. Following the cessation of mining, approximately 239 acres of disturbance would be reclaimed and once again provide foraging habitat for this species. The pit high wall may also create nesting habitat for this species.

Peregrine Falcon

This species was not found within the Project area during the field surveys and no impact would occur to this species as the result of the implementation of the Proposed Action.

Western Burrowing Owl

This species was not found at the Project area, but potential habitat for this species exists within the Project area. Therefore, indirect impact to this species would occur as the result of the habitat removal during the implementation of the Proposed Action. The amount of habitat disturbed (287 acres) is a small percentage of the habitat available in the general vicinity and does not represent sufficient habitat loss to result in a population change. The impact would be temporary until the reclamation is completed and the reclaimed areas are once again vegetated. The pit areas would represent a permanent reduction of habitat availability for this species.

Desert Bighorn Sheep

Desert bighorn sheep are found in the Bare Mountains and are known to use portions of the Project area during the year. Two lambing sites were observed in the Project area. These are generally isolated places with limited access to provide protection from predators until the lambs are mobile. Development of the pit would impact these areas, but would also create suitable lambing habitat that could be used at the cessation of mining. Pit design and proposed reclamation procedures would allow for safe ingress and egress of bighorn sheep at the conclusion of the Project.

A desert bighorn sheep guzzler is located approximately one-half mile from the Project area and would not be impacted by the Proposed Action. The restricted public access to this area during the life-of-mine may offset any potential impacts caused by the mining activity by limiting human activity during critical times of the year (i.e., lambing season).

Bats

The 2007 survey for bats indicated that several species of bats do forage within the Project area. The implementation of the Proposed Action would reduce the foraging habitat for these species by approximately 287 acres. At the cessation of mining, reclamation of the mine facilities would return foraging habitat to all but 48 acres (i.e., open pit area) of the disturbance footprint. Because the Project area does not represent any unique or limited habitat, this indirect impact would not cause population level impacts to any of the bat species.

The historic Gold Ace Mine workings were examined for suitability as bat habitat and most of the workings were single shafts or adits that were relatively shallow (i.e., less than 60 feet) and had no indication of use as roost sites (Converse Consultants 2008). The workings that were connected and had the highest potential to be used as roost habitat were surveyed using Anabat recording equipment. The results of the survey indicated that bats in the area were not exiting the mine workings but were foraging in the area. Consequently, any impact to the historic mine workings from the Proposed Action, either as direct mining of the workings or vibrations from blasting and hauling in the area, would not impact bats.

Of the six bat species observed during the bat survey, the Western pipistrelle, pallid bat, California myotis, Yuma myotis, and Mexican free-tailed bat are all known to roost in rock crevices (some of these species will also use caves or old mine workings as well), supporting the conclusion that the Project would not impact roosting habitat associated with the Gold Ace Mine. The Western red bat roosts primarily in trees and is generally associated with riparian habitat. The presence of this species within the Project area may be related to riparian habitat at Specie Spring (on the east side of the Bare Mountains) and the Amargosa Narrows (over three miles northwest of the Project area). No trees or riparian habitat occur on the Project area.

The shaft in the area of the proposed heap leach pad would be backfilled during the construction of the heap leach pad. No sign of bat roosting was observed in this shaft.

Extensive night roosting habitat (i.e., rock crevices) exists in the Bare Mountains adjacent to the Project Area for five of the six bat species; therefore the loss of these historic workings is not likely to have an impact at the population level. No roosting habitat or preferred foraging habitat for Western red bat exists at or near the Project areas. Therefore, the impacts to bats as a result of implementing the Proposed Action are expected to be indirect impacts and limited to disturbance of foraging habitat.

Amargosa Toad

Neither Amargosa toad nor toad habitat was found on the Project area. The nearest habitat for this species is in either Specie Spring (on the east side of the Bare Mountains) or the Amargosa Narrows (over three miles northwest of the Project area). The proposed Project would have no impact on this species.

Disturbance of 287 acres of vegetation would contribute to cumulative effects for this resource.

4.1.11 Wild Horses and Burros

The Project area is outside of the Bullfrog HMA, but occasionally wild horses and burros are sighted on or near the Project area. The fencing proposed for the Project area would keep the burros out of the active mine area and no direct impacts to burros are anticipated. Wild horses are not likely to frequent the area after human activity increases. Removal of vegetation for mine development would not represent an impact to wild horses or burros, as this vegetation is outside of the HMA.

4.1.12 Visual Resources

Although located approximately three miles east of US Highway 95, the Project Area would be partially viewable by travelers on the highway. Three Key Observation Points (KOPs) were established to evaluate the impact to visual resources and are shown on Figures 4-4, 4-5, and 4-6. The KOPs correspond to views along US Highway 95 from the south, southwest, and northwest. Visual Contrast Rating Worksheets (BLM Form 8400-4) for the three KOPs are provided in Appendix E.

The view from the south, KOP #3 (Figure 4-4), would provide the greatest view of the open pit high wall (Bullmoose North and South), some view of the Southwest and Gold Ace dumps, heap

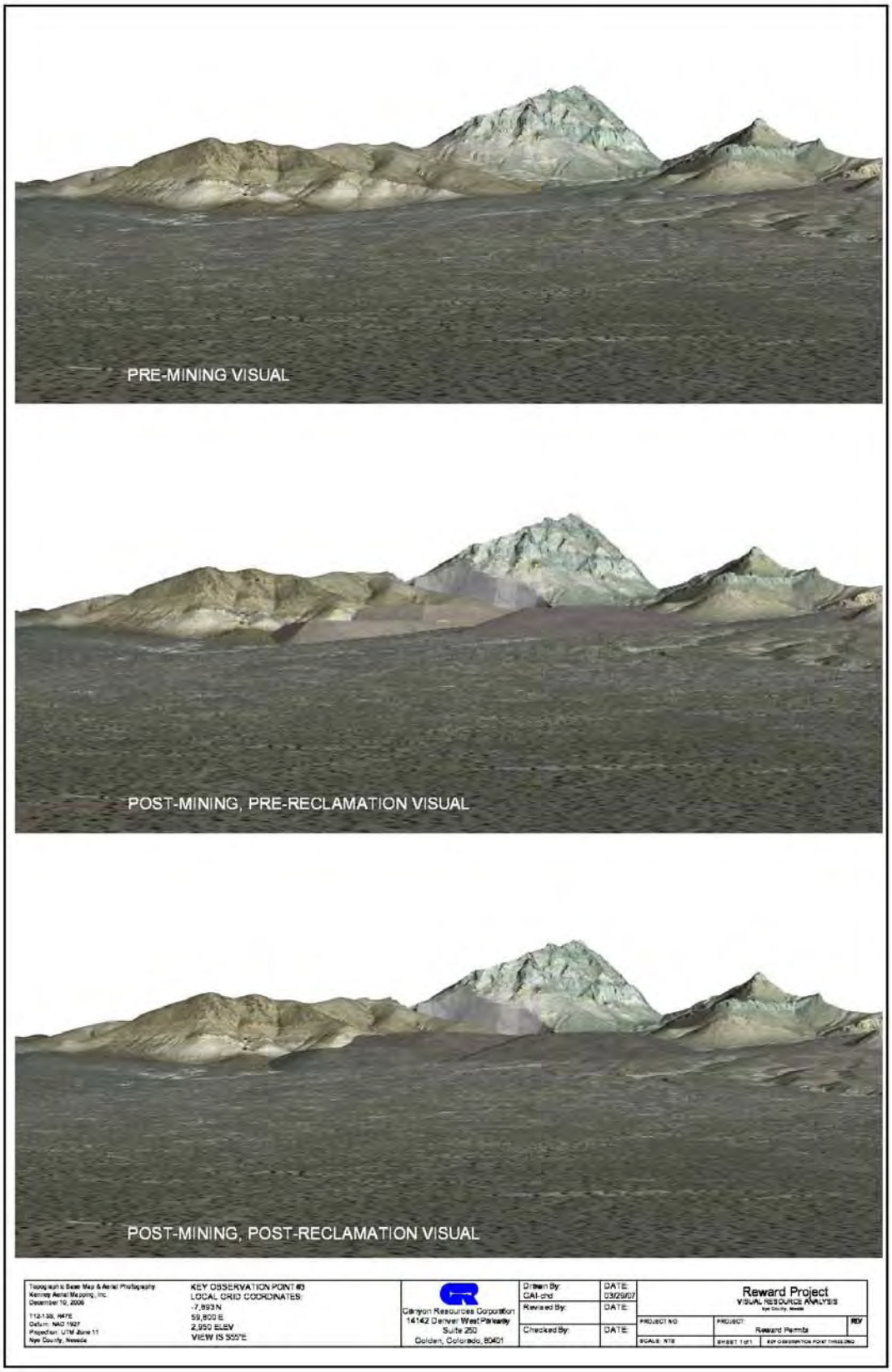


Figure 4 - 4: View from Key Observation Point Number 3

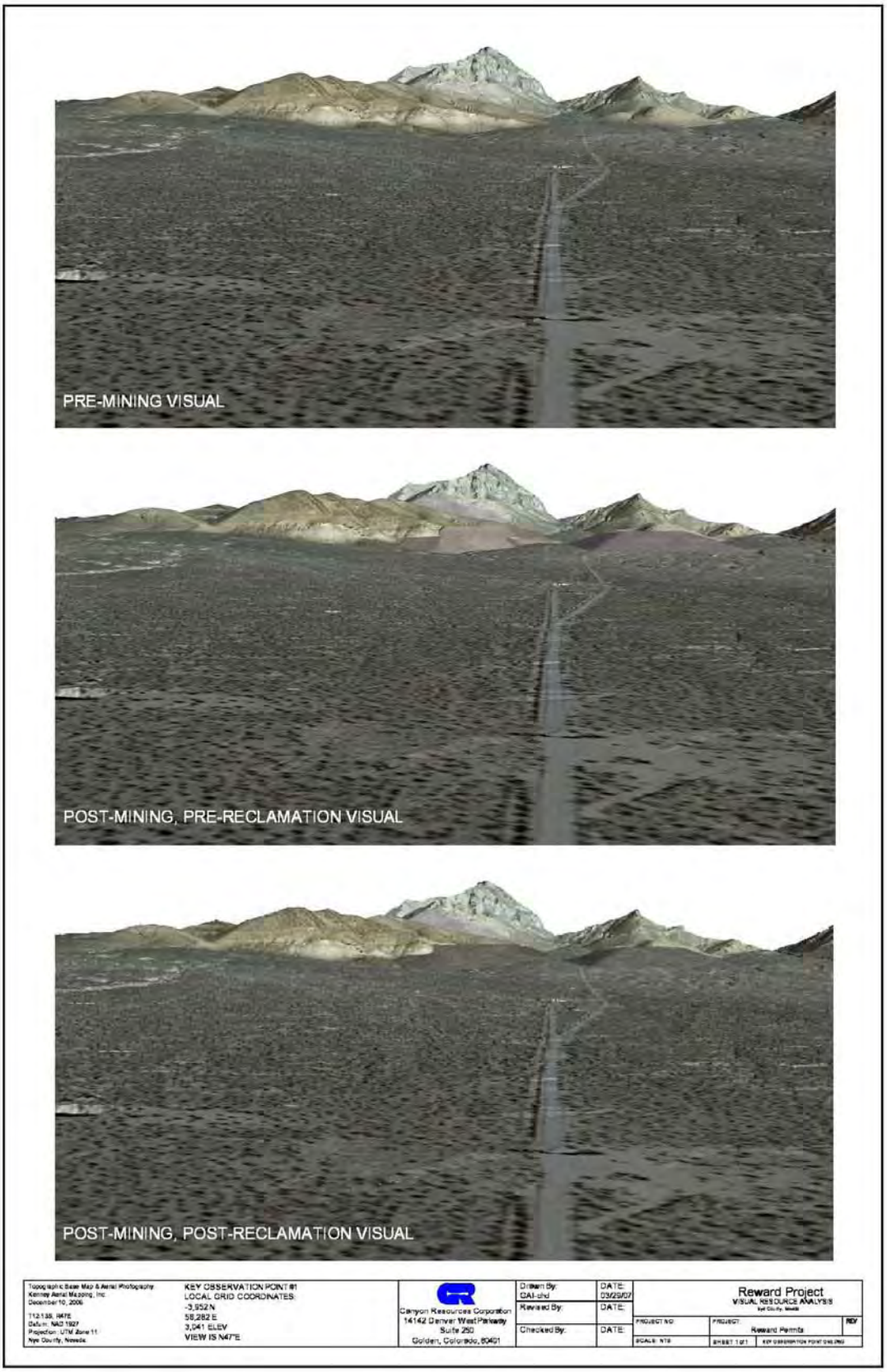


Figure 4 - 5: View from Key Observation Point Number 1

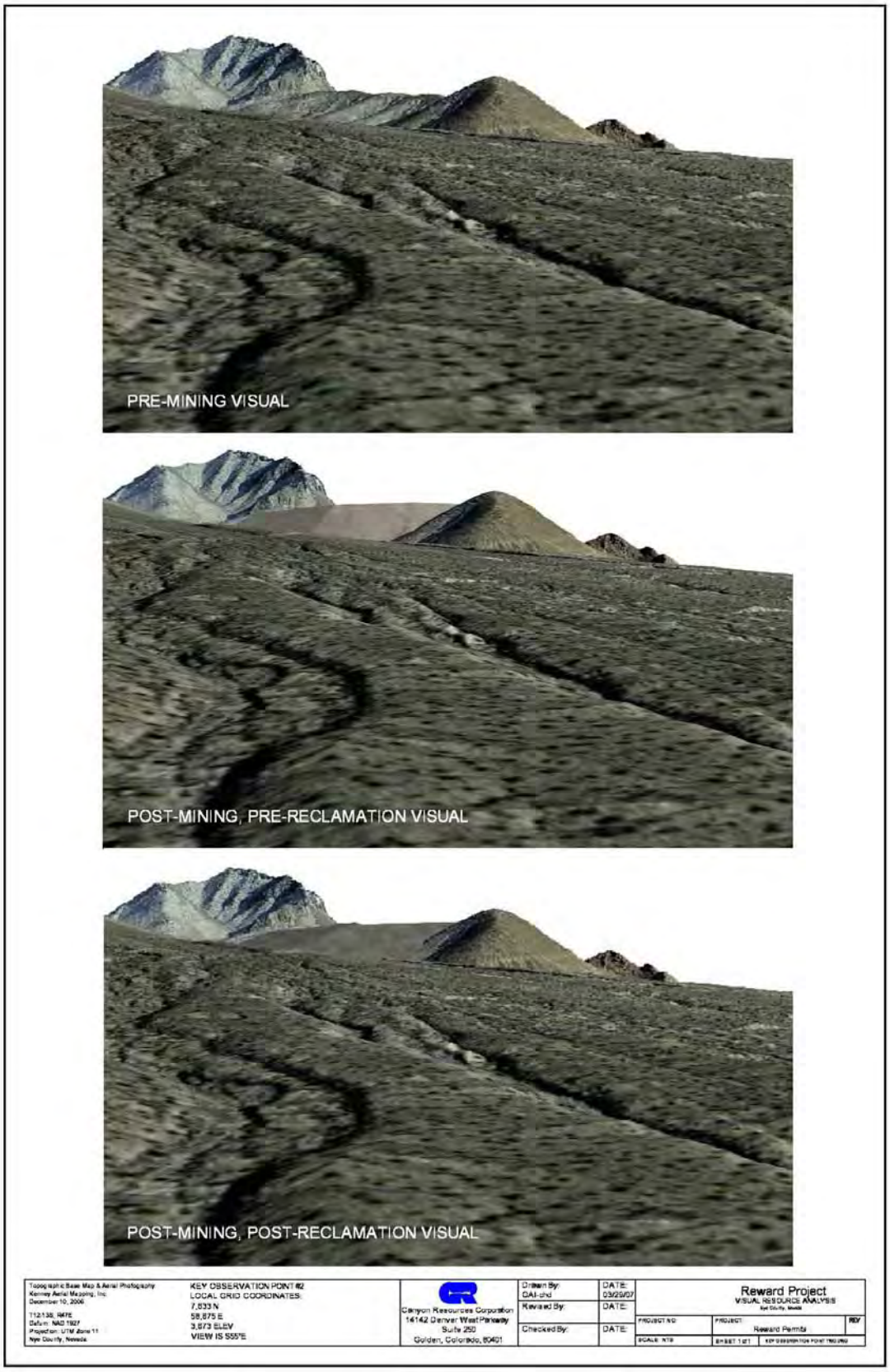


Figure 4 - 6: View from Key Observation Point Number 2

leach, and the ancillary facility site area. During active mining, these facilities would create a moderate contrast in color due to the exposure of unweathered rock in the highwall and waste dump. A slight contrast in texture would result as these facilities would be isolated features on the landscape. These features would also contrast with the coarse texture of the vegetated undisturbed landscape, as the heap leach and waste rock dumps would have a fine texture appearance from the highway. The north area access road would add a linear element, but the vegetation and slight topographic features would make the road difficult to see from the highway. The benches of the waste dump would also add a strong linear element and contrast with the jagged line of the background mountains. The form of the facilities would be more regular than the mountains, but the general shape of the waste rock dumps and heap leach pad would not contrast greatly with the mountains. Any structures, storage tanks, or other facilities associated with the ancillary site area would also be viewable. These temporary facilities would likely have high contrast in line, form, color, and texture with the background landscape.

The view from the southwest, KOP #1 (Figure 4-5) would provide the greatest view of the heap leach pad, but the foothills would block the view of most of the pit area high wall (Bullmoose North and South). As the Southwest Dump is constructed, it would block more of the view of the pit area. The contrast between the pre-mining and pre-reclamation conditions would be similar to those described above for KOP #3, except that because less of the mine facilities would be visible from this KOP, the overall degree of contrast in line, form, texture, and color would be less.

The view from the northwest, KOP #2 (Figure 4-6), would include parts of the open pit highwall (Good Hope and upper Bullmoose North) and the North Dump. The North Dump would add a linear element, appearing level in contrast to the jagged outline of the mountains. The unweathered rock of the North Dump and the pit highwall would contrast with the color of the mountains and undisturbed hills and alluvial fan in the foreground. The texture of the undisturbed areas would also be coarse in comparison to the texture of the North Dump. There would not be much contrast in form from this KOP. The pit high wall would blend with the steep terrain of the Bare Mountains and the North Dump would be similar in form to the foreground hills.

The contrast between the post-reclamation and pre-mining conditions from all three KOPs would be much less than the contrast between the pre-mining and pre-reclamation conditions. The regrading of the dumps and heap leach pad would reduce the linear contrast from KOPs 1 and 3. Reclamation of the roads and power lines, and removal of the fences would also reduce the linear contrast. The North Dump would still have some minor linear contrast from KOP 2. The contrast in texture would decline over time as the vegetation establishes and begins to take on the structure of the non-disturbed vegetation. The redistribution of growth medium and the establishment of vegetation on the waste rock dumps and heap leach pad would reduce the contrast in color. The pit high wall would slowly weather and over time the contrast in color between the high wall and the Bare Mountains would be reduced. The contrast in form would be almost completely eliminated following regrading of the waste rock dumps and the heap leach pad.

Landscape modifications resulting from the construction and operation of the Proposed Action would be within the BLM VRM Class III objectives. The level of change to the characteristic landscape should be moderate.

The contrasts in line, form, texture, and color created by the Proposed Action would be temporary in nature. The successful reclamation of the waste dump and haul road, as well as the removal of the ancillary facilities, would reduce or eliminate the contrasts in line, form, color, and texture. The exposed rock in the high wall would require years to decades to weather and

change color, but due to the variety of rock color and visible lithographic layering, this contrast in color would not attract the attention of the casual observer. The effects of the Proposed Action on visual resources would be consistent with the BLM-prescribed Class III VRM objectives.

Direct impacts to visual resources would result from implementation of the Proposed Action.

4.1.13 Socio-economics

Overall, the development of the Reward Mine is likely to have positive socio-economic impacts in the local area. The increased payroll, state and county taxes, and indirect employment effects are much needed in this region of the state. Due to the existing Nevada budget crisis, any increased demand for services provided by state, county, or local budgets are not likely to be funded. Therefore, there may be some shortage of services until the state budget crisis is over.

4.1.13.1 Population

The development of the Reward Mine is likely to cause a slight increase in the populations of Beatty and Amargosa Valley. While it is the intent of CRRC to hire from the local workforce, there may be some positions for which the desired skills are not likely to occur in the local communities. In addition, experienced mine workers that have been affected by other mine closures in Nevada and California may seek employment at the Reward Mine. These two factors would require relocation of workers to the Beatty/Amargosa Valley area. This need for outside workers is not expected to be more than approximately one third of the 80-man workforce anticipated for the mine, or less than 30 workers. Assuming that all are married and have one or more children, then the population increase would be approximately 100 to 150 people. This is within the range of population fluctuation between 1990 and 2007.

There may also be some increase in population due to increases in jobs that provide services or supplies to the mine. The analysis of the Daisy Mine included an estimate of approximately 30 indirect jobs in the rural sector and 20 jobs in the urban sector (BLM 1996). The Reward Mine is anticipated to be of shorter duration and smaller in size than the Daisy Mine; therefore, the number of indirect jobs in the rural and urban sectors would be less than 30 and 20 jobs, respectively. It is likely that most of this potential increase in jobs would come from the local area due to the high unemployment in this area.

4.1.13.2 Employment

The employment of up to 80 people at the mine from the Beatty/Amargosa Valley area would represent a much needed increase in employment for Nye County. In addition, the indirect jobs discussed previously, would also increase employment in the area. Unemployment is over eight percent; therefore any increase in employment would benefit the county as well as the local communities.

4.1.13.3 Housing

The local housing market would likely be able to absorb the small influx of workers and their families. Given the loss of work when Bullfrog and Daisy mines closed, housing is now available in the area. In addition, there are spaces in the mobile home and RV parks.

4.1.13.4 Schools

Any increase in student enrollment beyond the existing capacity of the Amargosa and Beatty schools is likely to be an impact due to the current Nevada budget crisis. It is unlikely that additional teachers or facilities could be added to facilitate increased enrollment above the maximum class size, at least in the short-term.

4.1.13.5 Health Care Services

Private health care services are likely to be able to absorb any increased demand in medical services by adding additional staff. However, programs provided by State or County budgets are not likely to be able to increase services over the current level due to the Nevada budget crisis.

Due to the intent to use the local workforce to the extent possible, the increased demand for medical services is not anticipated to be great.

4.1.13.6 Law Enforcement

The Reward Mine would not have an adverse impact on the existing law enforcement given the small influx of workers and the short duration of the Project.

4.1.13.7 Fire Protection

The Reward Mine would not have an adverse impact on the existing fire protection services. Training at the mine site for fire suppression may actually provide an increase in the number of trained personnel for the Beatty and Amargosa Valley Volunteer Fire Departments.

4.1.13.8 Water and Sewer

Following an upgrade of the water system and well donated by Barrick, the town of Beatty is no longer in a water shortage situation. The Project should not cause any adverse impact on the existing water and sewer facilities due to the low number of outside workers anticipated for the Project.

4.1.13.9 Electrical Services

The Reward Mine will obtain power from a new, dedicated line provided by Valley Electrical Association. A 25kV transmission line from a local substation in Beatty runs adjacent to the Project. A “drop” will be taken from this line near the access road to the mine. Approximately 3.5 miles of overhead line will convey power to the mine. This power use would not have an effect on the existing facilities in Beatty.

4.1.14 Hazardous Materials

Issues related to the presence of hazardous materials are the potential impacts to the environment from an accidental release of hazardous materials during transportation to and from the project site or from the use and storage at the site.

Operation of the proposed Reward Mine would involve the transportation, handling, storage, use, and disposal of hazardous materials. A list of the hazardous substances to be used during Project operation is provided in Section 3.14. Fire assay waste (cupels, crucibles, and slag) would be shipped off-site for recycling or disposal at a licensed facility.

All hazardous substances would be transported by commercial carriers in accordance with the requirements of Title 49 of the CFR. Shipments of hazardous substances would originate from cities such as Las Vegas or Reno and would be transported via State Highway 95. Sodium cyanide would come from northern Nevada, either Winnemucca or Carlin. Based on the quantity of the deliveries, the materials of greatest concern would be sodium cyanide for the heap leach process, and diesel fuel. Assuming two sodium cyanide deliveries per month and weekly diesel fuel deliveries, the number of deliveries per year would be 76 tanker trucks per year. Over the five year mining life, this would result in 120 deliveries of sodium cyanide and 260 deliveries of diesel. During the closure period, diesel fuel would continue to be delivered at about one-half

the rate (i.e., two per month) and sodium cyanide deliveries would not be necessary. The result would be an additional 130 deliveries, for a total of 510 deliveries over the life of the Project.

For this analysis, the assumption was made that the diesel would be delivered from Las Vegas, approximately 90 miles from the Reward site and the sodium cyanide would come from Carlin, approximately 350 miles from the Reward site. The probability of an accident resulting in a release involving deliveries of these two substances was calculated using the Federal Highway Administration truck accident statistics (Rhyne 1994). According to these statistics, the average rate of truck accidents for transport along a rural two-lane road is 2.19 accidents per million miles traveled (for liquid tankers carrying hazardous materials). The statistics further indicate that on the average, 18.8 percent of the accidents involving liquid tankers carrying hazardous materials resulted in a spill or release.

Over the life-of-mine, 120 deliveries of sodium cyanide over approximately 350 miles per trip would result in approximately 0.042 million miles of travel. The calculated number of accidents would be 0.09 over the five year active mining period. For diesel, 390 deliveries during the ten years of operation and closure, at the rate of 90 miles per trip would result in approximately 0.0351 million miles of travel. The calculated number of accidents would be 0.08 accidents. Using the average of 18.8 percent of the accidents result in a spill or release, the transport of hazardous materials would result in less than one (~0.03) accident involving a spill of sodium cyanide or diesel fuel.

Adding the other shipments of the materials transported in smaller quantities and at lower frequencies would incrementally increase the odds of a release of hazardous substances, but the odds are still less than one accident per life-of-mine.

The environmental effects of a release would depend on the material released, quantity released, conditions at the time of the release, and location of the release. Minor or major spills at the mine site would be immediately cleaned up due to the implementation of the Spill Prevention and Counter Measures Plan that is required for the site. However, spills off-site, either minor or major, would have potential for greater impacts due to the delayed response time. Spills near water could have immediate adverse effects on the water quality and aquatic resources. However, the anticipated route for transportation of hazardous substances does not involve any major waterways. The environmental effects of a cyanide spill would be limited to the extent and time of contamination due to the rapid degradation of cyanide within the environment.

Due to the limited number and size of the communities along the transportation route, the probability of a release occurring in a populated area is low, and the probability of a release involving an injury or fatality would be still lower. Therefore, it is not anticipated that a release involving a severe effect to human health or safety would occur during the life of the Project.

Storage on site would comply with state requirements. Tanks and vessels would be placed on a plastic lined containment surface with interior sumps to route any spilled solutions to lined collection areas. In addition, all hazardous material storage tanks would have secondary containment sufficient to hold at least 110 percent of the volume of the largest tank in the containment area.

The probability of minor spills of materials such as lubricants and oils would be relatively high during operations for a variety of reasons. CRRC has prepared an Emergency Response Plan that establishes procedures for responding to accidental spills or releases of hazardous materials to minimize health risks and environmental effects. The plan includes procedures for evacuating personnel, maintaining safety, cleanup and neutralization actions, emergency contacts, internal and external notifications to regulatory authorities, and incident

documentation. Implementation of the Emergency Response Plan is expected to minimize the potential for impacts associated with potential releases of hazardous materials.

4.1.15 Human Health and Safety

The mine workers and contractors for CRRC would receive mandatory MSHA training with respect to mine hazards, as well as task-specific training related to their primary jobs. Visitors and vendors would receive site-specific training and hazard warning prior to being granted access. Consequently, the area of active mining (595-acre Project area) would be fenced (desert tortoise fence and three-strand barbed wire) and signed to alert the public of the active mining status and hazards associated with entering the fenced area. Berms would be constructed at the base of the waste rock dumps to contain large boulders from rolling from the dump sites. Similarly, the pit areas would be bermed on the north, west, and south sides to prevent the public from wandering into an active pit. The east side of the pit would extend into the steep terrain and a berm at this location is not feasible. The hazardous chemicals and materials would be located away from areas of public access and process solutions would be contained and fenced (chain link fence around process facilities). Blasting materials would be kept in areas not accessible to the general public. The crusher site would be fenced with a three-strand barbed wire fence. Gates would be installed near the administrative trailer to control public access to the area of active mining.

These public safety measures would reduce the risk of injury or illness to the public from the Proposed Action.

4.2 ENVIRONMENTAL CONSEQUENCES – NO ACTION ALTERNATIVE

Under the No Action Alternative, the mine would not be developed. The relocation of geologic materials, salvage and mixing of soils, particulate emissions to the atmosphere, use of water and resulting local drawdown of the water table, disturbance of the vegetation, especially cacti, potential for noxious weed establishment, disturbance to wildlife and their habitats, potential impacts to special status species, visual resource impacts, and socio-economic impacts would not occur. The site would remain in its current environmental and socio-economic status.

Benefits to the local and regional economy would not occur under this alternative.

4.3 MONITORING

Monitoring beyond the normal compliance monitoring conducted by the permitting agencies would include the following:

1. Monitoring for Desert Tortoise as specified in Section 4.1.10.2;
2. Monitoring for noxious weeds as specified in the Noxious Weed Risk Assessment and Las Vegas Field Office Noxious Weed Contingency Plan;
3. Water well monitoring. CRRC would provide an annual report summarizing any well data available from U.S. Ecology, a nearby USGS site, or other sites within the area of potential drawdown from the Reward production well; and
4. Monitoring for water quality as required in the Water Pollution Control Permit.

4.4 MITIGATION

No mitigation has been identified for the resources analyzed beyond the environmental protection measures identified in Section 2.2.9, with the exception of desert tortoise. The stipulations identified in the Biological Opinion (Section 4.1.10.2) constitute acceptable levels of mitigation for desert tortoise.

The potential exists for reclamation to be completed and then have unfavorable growing conditions, leading to a failure of the reclamation effort. This is not likely to occur over the entire Project due to the concurrent reclamation that would take place. In the event of a reclamation failure, CRRC would prepare the seedbed as necessary and reseed. A second failure would result in evaluation of the site to determine if the facility is stable (i.e., not susceptible to soil loss) and to determine if revegetation through natural colonization is likely to occur over time.

4.5 CUMULATIVE EFFECTS ANALYSIS

Cumulative effects are described for those resources for which the Reward Project creates direct or indirect impacts, as these impacts would add to the cumulative total impact for the respective resources. Resources for which no impacts are identified are not discussed in the context of cumulative effects.

This section analyzes the potential cumulative impacts from past, present, and reasonably foreseeable future Projects, combined with the proposed action within a cumulative assessment area. Cumulative impacts have been defined as "[T]he impact which results from the incremental impact of the action, decision, or Project 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" (BLM 1990).

For this analysis, the cumulative assessment area has been defined as the upper Amargosa Basin. This generally covers an area approximately eight miles from the Reward Project to the northwest, west, and southeast. The crest of the Bare Mountains forms the boundary of the cumulative assessment area to the east of the Project. This area extends to the town of Beatty, the Bullfrog Mine, U.S. Ecology, and portions of U.S. Highway 95 and State Route 374. The cumulative assessment area is approximately 128,700 acres.

The proposed timeframe or life-of-mine for the Reward Project is up to five years of active mining and three to five years for reclamation and closure. Based on this schedule, a timeframe of ten years has been assumed for this cumulative impacts analysis.

4.5.1 Description of Interrelated Projects

The BLM has determined that the primary activities that would contribute to cumulative impacts in the cumulative assessment area for the Reward Project would include past, present, and reasonably foreseeable future mineral exploration, development, and expansion activities, administrative land use activities, combined with the proposed Reward Mine. The following sections describe past, existing, and reasonably foreseeable future actions in the cumulative assessment area. Surface disturbance associated with these activities is summarized in Table 4-1.

4.5.2 Past Actions

The cumulative assessment area includes part of the Bare Mountains (Fluorspar) and Bullfrog (Rhyolite) mining districts, which have a long history of mineral development, commencing with the discovery of gold in 1905. The Bullfrog District has produced the largest amount of gold-silver in southern Nye County. Other minerals produced in the Bullfrog District include copper, lead, bentonite, and uranium. The Gold Ace Mine is the primary mine on the west side of the Bare Mountains.

These mining operations were primarily adit and shafts, with numerous prospects. Waste rock was generally deposited near the shaft or adit entrance. Approximately 10 acres of disturbance is associated with this historic mining.

Table 4 - 2: Interrelated Disturbance within the Cumulative Assessment Area

Past Disturbance	***Acres of Disturbance***
Notice Level Exploration/Historic Mining	10
Bullfrog Mine	1,347
Subtotal	1,357
Existing Disturbance	
U.S. Ecology	20
Town of Beatty[1]	85
Paved and unpaved roads	200
Administrative Land Uses (Rights of Way)	11
Subtotal	316
Reasonably Foreseeable Future Disturbance	
Mineral Exploration Activities	20
Subtotal	20
Total Acres of Disturbance	1,693

[1] *Includes the towns of Beatty and Rhyolite, and the Beatty Airport*.

The Bullfrog Mine located approximately three miles southwest of Beatty was an open pit and underground gold mine. The mine has been closed but included approximately 1,350 acres of disturbance over the life-of-mine.

4.5.3 Existing Actions

U.S. Ecology, a hazardous material processing center, is approximately five miles south of the Reward Mine. The facility occupies approximately 20 acres. This site also includes an active well.

The communities of Beatty and Rhyolite, as well as the Beatty Airport, occupy approximately 85 acres. In addition, there are various existing administrative land uses, including rights-of-way for AT&T (Nev 066111) and microwave communications site and the Valley Electric Association power transmission line right-of-way (N-1614). Pave and unpaved road account for approximately 200 acres of disturbance.

4.5.4 Reasonably Foreseeable Future Actions

The reasonably foreseeable future actions include continuation or expansion of mineral exploration and administrative land uses (r-o-ws). Approximately ten acres of disturbance are Projected for each of these activities.

4.5.5 Cumulative Impacts

Resources for which direct impacts were identified include soils, geologic resources, air quality, water resources, vegetation, special status species, and visual resources.

4.5.5.1 Soils

Approximately 1,980 acres of soils would be disturbed in the cumulative assessment area, including the Reward Project disturbance with past, present, and reasonably foreseeable future actions. The majority of this has been previously disturbed (past and present actions), and the majority of the acreage at the Bullfrog Mine has been reclaimed. Cumulative impacts would be minimized in the future by salvaging available growth media for redistribution during reclamation. The mixing of the soils during salvage and re-distribution alters the soil properties and eliminates the soil horizons. While it will take decades or longer for the soils to regain the pre-disturbance characteristics, the redistributed material will support plant growth, rodent burrowing, and other ecological processes that will allow the sites to function while the recovery of the soil characteristics occurs.

This disturbance represents approximately two percent of the cumulative assessment area.

4.5.5.2 Geologic Resources

The impact to geologic resources from mining since the early 1990s has been the removal of geologic resources. This displacement of material and removal of minerals changes the overall geology of the area being mined. The Reward Project in conjunction with other reasonably foreseeable future mining operations would continue to remove mineral deposits from the cumulative assessment area.

4.5.5.3 Air Quality

The major source of air emissions in the cumulative assessment area had been the Bullfrog Mine, but this facility has been closed and the only contribution to air quality emissions from this facility is from naturally occurring fugitive dust. Other potential sources of fugitive dust could result from vehicular travel on unpaved roads. U.S. Ecology is located approximately five miles from the Reward Project. This location has unpaved roads and part of their process includes developing and reclaiming landfills. The movement of earth for this process could contribute to fugitive dust in the local area. Casual recreational use of dunes in the area may also contribute to fugitive dust.

Proposed mining at the Reward Mine would likely increase the emissions of particulate matter and hydrocarbons. However, the Reward Mine would disturb approximately one fifth of the area of the Bullfrog Mine; consequently the Reward Mine would have limited fugitive dust emissions due to the operating constraints included in the Air Quality Permit. The amount of emissions allowed in the permit would not deteriorate air quality within the cumulative assessment area. Emissions from reasonably foreseeable future actions would be limited to fugitive dust from road construction for exploration and drill pad development. During the permitting process, the Bureau of Air Pollution Control would assess any new sources in conjunction with existing sources in the area to ensure that ambient air quality standards would be met and air resources would not be cumulatively impacted.

4.5.5.4 Water Resources

Surface water impacts from past, present, and reasonably foreseeable future actions have been limited in the cumulative effects area due to the lack of surface water resources. Ground water impacts have resulted from ground water withdrawal for the Bullfrog Mine and the town of Beatty. The withdrawal for the Bullfrog Mine has ceased and a portion of the Bullfrog Mine withdrawal has been transferred to the community of Beatty.

The analysis of the Reward Mine water removal for process water has indicated a relatively small impact (i.e., drawdown or cone of depression), limited to the area within two miles of the

mine during operations and up to approximately seven miles from the mine (i.e., within the cumulative assessment area) at 80 years after the cessation of mining. This may contribute lowering of the U.S. Ecology well approximately five miles from the site. The predicted level of impact is less than one foot of drawdown at the well during active mining and approximately 0.1-feet 80 years following cessation of pumping.

Ground water quality is not anticipated to be impacted by the Reward Mine; therefore, no cumulative impact to water quality is anticipated.

4.5.5.5 Vegetation

Of the 1,693 acres of disturbance within the cumulative assessment area, 306 acres represent a permanent loss of vegetation. The majority of the past, present, and reasonably foreseeable future action disturbance is mining related and most of this acreage would be reclaimed at the end of mining. The 287 acres of proposed disturbance for the Reward Mine would result in only 47.6 acres of open pit area that would not be revegetated.

Because of the arid environment at the Reward Mine site, the reestablishment of vegetation on the reclaimed surfaces may require ten or more years to reach pre-mining levels of cover, and perhaps even longer to establish similar plant community composition.

4.5.5.6 Wildlife

Of the 1,693 acres of disturbance within the cumulative assessment area, 306 acres represent a permanent loss of wildlife habitat. The majority of the past, present, and reasonably foreseeable future action disturbance is mining related and most of this acreage would be reclaimed at the end of mining. The 287 acres of proposed disturbance for the Reward Mine would result in only 47.6 acres of open pit area that would not be revegetated.

Because of the arid environment at the Reward Mine site, the recovery of the habitat on reclaimed surfaces may require ten or more years to reach pre-mining levels of cover and species composition.

4.5.5.7 Special Status Species

The disturbances associated with past, present, and reasonably foreseeable future actions represent a loss of desert tortoise habitat. All disturbances within the cumulative assessment area is within low density tortoise habitat. The stipulations in the Biological Opinion issued by the USFWS provide for the protection of this species and the reclamation outlined in the Proposed Action provides for the re-establishment of habitat for this species following the end of mining. Similarly, the reclamation at the Bullfrog Mine had created conditions suitable to desert tortoise. Consequently, the long-term cumulative impact to habitat for this species is the permanent disturbance associated with the communities, roads, U.S. Ecology site, administrative land uses (rights-of-way), and the pit areas from the Bullfrog Mine and the proposed Reward Mine.

4.5.5.8 Visual Resources

Mining in the viewshed has included the Bullfrog Mine, which is visible from the KOPs. The pit highwall and associated benches are still visible from this mining. As the exposed rock weathers and the pit benches slough over time, this contrast in color, line, and texture will start to blend with the surrounding landscape.

Power lines, the state highway, and dirt roads also add a linear element to the Amargosa Valley. The U.S. Ecology facility adds contrast in color, line, texture, and form. The Proposed Action

adds to these contrasts during the short-term, but the location of the facilities to be reclaimed would obscure the view of the Reward Pit. Consequently, the Proposed Action would not add any cumulative effect over the existing condition in the long-term.

5 CONSULTATION AND COORDINATION

5.1 LIST OF PREPARERS

Bureau of Land Management, Pahrump Field Office and Las Vegas Field Office

Dave Fanning	Project Lead, Minerals
Jeff Steinmetz	NEPA, Lead Planning and Environmental Coordinator
Sarah Peterson	Soils, Air, Water, and Riparian
Christina Lund	Vegetation and Special Status Plants
Kathleen Sprowl	Cultural Resources
Susanne Rowe	Cultural, Native American Values, Paleontology
Lisa Christianson	Air Quality
Mark Slaughter	Wildlife, Special Status Wildlife
Jayson Barangan	Natural Resource Specialist
Everett Bartz	Range, Noxious Weeds
Fred Edwards	Botanist, Noxious Weeds
Wendy Seley	Visual Resources/Realty

Great Basin Ecology, Inc.

Gary N. Back	Ecologist, Project Manager
Rachel Olsen	GIS, Drafting
Stefanie T. Adams	Technical Editing

SRK Consulting (U.S.), Inc.

Angel L. Nicholson	Biological Consultant

Lewis Environmental Consulting, LLC

Todd Lewis	Drafting

5.2 PERSONS, GROUPS, AND AGENCIES CONSULTED

CR Reward Corporation

Kenneth G. Mann	Project Manager
J. Michael Worley	Manager, Environmental, Health and Safety
Joseph L. Balas	Process Manager
Bill Stanley	Geologist, Vice President of Exploration

Nevada Natural Heritage Program

Eric Miskow	Data Manager

U.S. Fish and Wildlife Service

Robert D. Williams	Field Supervisor, Nevada Fish and Wildlife Office, Reno
Michael Burroughs	Biologist, Nevada Fish and Wildlife Office, Las Vegas

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6.2 LIST OF ACRONYMS

Above mean sea level	amsl
Acid neutralization potential/acid generation potential	ANP/AGP
Amargosa Desert Research Site	ADRS
Army Corps of Engineers	ACOE
Below ground surface	bgs
Best Management Practices	BMPs
Bureau of Land Management	BLM
Bureau of Mining Regulations & Reclamation	BMRR
Code of Federal Regulations	CFR
Consumer Price Index for All Urban Consumers	CPI-U
CR Reward Corporation	CRRC
Emergency Medical Technician	EMT

Endangered Species Act	ESA
Environmental Assessment	EA
Environmental Impact Statement	EIS
Evapo-transpiration	ET Cell
Federal Emergency Management Agency	FEMA
Federal Environmental Protection Agency	USEPA
Federal Land Policy and Management Act	FLPMA
Gallons per minute	gpm
Gallons per minute per square foot	gpm/sf
Key Observation Points	KOPs
Las Vegas Field Office	LVFO
Linear low density polyethylene	LLDPE
Management Framework Plan	MFP
Meteoric Water Mobility Procedure	MWMP
Mine Safety and Health Administration	MSHA
Million gallons annually	MGA
Million tons	mt
National Ambient Air Quality Standards	NAAQS
National Environmental Policy Act	NEPA
National Register of Historic Places	NRHP
Natural Resource Conservation Service	NRCS
National Earthquake Information Center	NEIC
Nevada Bureau of Air Pollution Control	BAPC
Nevada Division of Environmental Protection	NDEP
Nevada Division of Wildlife	NDOW
Nevada Natural Heritage Program	NNHP
Nevada Revised Statues	NRS
Petroleum contaminated soil	PCS
Plan of Operations	POO
Pure live seed	PLS
Stormwater Pollution Prevention Plan	SWPPP
SVL Analytical Labs	SVL
U.S. Fish and Wildlife Service	USFWS
United States Geologic Service	USGS
Visual Resource Management Classes	VRM
Water Management Consultants	WMC
Water Pollution Control Permit	WPCP
Waters of the United States	WOUS

Appendices

APPENDIX A
Standard Operating Procedures, Locatable Minerals

RMP APPENDIX M
Locatable Minerals

BLM provides for mineral entry, exploration, location, and operations pursuant to the mining laws in a manner that 1) will not unduly hinder the mineral activities, and 2) assures that these activities are conducted in a manner which will prevent undue or unnecessary degradation of the public land.

Notification to the Authorized Officer is required on all operations in project areas in which surface disturbance will be five acres or less.

A Plan of Operations and a Reclamation Plan are required in situations in which there will be more than five acres of cumulative unreclaimed surface disturbance in a project area. These two plans are also required for any mining activity on special category lands, such as Areas of Critical Environmental Concern and areas closed to off-highway vehicles. Appropriate off-site mitigation may be negotiated during a plan of operations review for locatable mineral actions when an irretrievable loss of important habitat is unavoidable, or a significant long-term adverse impact will occur. The preferred alternatives to off-site mitigation are avoidance of critical and crucial habitat and reclamation of disturbed habitat to approximate pre-disturbance productivity.

The Authorized Officer may require modifications of Plans of Operations to meet the requirements of the regulations and to prevent undue or unnecessary degradation of public land.

Plans of Operations cannot be approved until Section 106 of the National Historic Preservation Act, and Section 7 of the Endangered Species Act, and the National Environmental Policy Act have been complied with.

Reclamation of disturbed areas to meet BLM standards is required for all levels of activity: Casual Use, Notice, or Plan of Operations.

Additional regulatory requirements will be enforced in Wilderness Study Areas through regulations (43 CFR 3802) and through the Interim Management Policy for Wilderness Study Areas.

All operations shall comply with Federal and State laws, including those relating to air quality, water quality, solid wastes, fisheries, wildlife and plant habitat, and archaeological and paleontological resources.

The BLM will conduct validity examinations, reviewing the validity of mining claims to determine if a discovery has been made, under the following conditions:

1) Where a mineral patent application has been filed and a field examination is required to verify the validity of the claim(s).

2) Where there is a conflict with a disposal application, and it is deemed in the public interest to conduct a validity examination; or where the statute authorizing the disposal requires the removal of mining claims that are not valid. If the validity examination made in the latter case were to show that the mining claim was valid, the disposal action could not be completed.

3) Where the land is needed for a Federal program.

4) When a mining claim is occupied under the guise of the mining law and flagrant or questionable misuse of the land is observed, the BLM will undertake a review of the occupancy based on current regulations. If it is found, in fact, that such use is not necessary for, and reasonably incident to, mineral development, BLM will act to terminate the use and seek compensation for damages.

Withdrawals from mineral entry will be undertaken in cases in which there are significant resource values that cannot be adequately protected under the regulations concerning surface management. Such withdrawn acreage would include areas designated by Congress as wilderness, sensitive species or threatened species habitat, riparian areas, areas possessing important historical and cultural resources, and areas set aside for recreational development.

Bonding will be required for all plans of operations and financial guarantees will be required for operations conducted under a notice to ensure that satisfactory reclamation takes place. All operations using cyanide will follow the requirements in BLM's Nevada Cyanide Management Plan.

The BLM will coordinate each mine plan and mine closure in conjunction and consultation with the Bureau of Reclamation and Regulation of the Nevada Division of Environmental Protection. This coordination ensures that the State of Nevada reclamation laws are implemented on Federal and private lands, and that all necessary State permits will be issued and followed.

APPENDIX B
Waste Rock Characterization Data

JUL-20-98 15:02 From:SVL ANALYTICAL +2087830891 T-834 P.10/25 Job-915

Alluvium

L ANALYTICAL, INC.

ernment Gulch ▪ P.O. Box 929 ▪ Kellogg, Idaho 83837-0929 ▪ Phone: (208)784-1258 ▪ Fax: (208)783-0291

NDEP PROFILE II REPORT MWMP

MARIGOLD MINING COMPANY

RWRD98-QAL&C Sampled: 4/14/98

PARAMETERS	RESULTS	UNITS	STANDARDS	DATE
Alkalinity (Total)	123	mg/L	-	7/10/98
Aluminum	<0.037	mg/L	0.05--0.2	7/17/98
Antimony	<0.002	mg/L	0.006	7/16/98
Arsenic	<0.04	mg/L	0.05	7/17/98
Barium	0.009	mg/L	2.0	7/17/98
Beryllium	<0.002	mg/L	0.004	7/17/98
Bismuth	<0.027	mg/L	-	7/17/98
Boron		mg/L	-	
Cadmium	<0.002	mg/L	0.005	7/17/98
Calcium	12.0	mg/L	-	7/17/98
Chloride	127	mg/L	250--400	7/17/98
Chromium	<0.008	mg/L	0.1	7/17/98
Cobalt	<0.003	mg/L	-	7/17/98
Copper	<0.004	mg/L	1.3	7/17/98
Fluoride	0.6	mg/L	2.0--4.0	7/17/98
Gallium	<0.033	mg/L	-	7/17/98
Iron	<0.019	mg/L	0.3--0.6	7/17/98
Lead	0.003	mg/L	0.015	7/15/98
Lithium	0.046	mg/L	-	7/17/98
Magnesium	15.4	mg/L	125--150	7/17/98
Manganese	<0.001	mg/L	0.05--0.1	7/17/98
Mercury	<0.0002	mg/L	0.002	7/16/98
Molybdenum	0.008	mg/L	-	7/17/98
Nickel	<0.016	mg/L	0.1	7/17/98
Nitrate as N	0.58	mg/L	10.0	7/17/98
pH (units)	8.99	S.U.	6.5--8.5	7/10/98
Phosphorous	1.25	mg/L	-	7/17/98
Potassium	19.1	mg/L	-	7/17/98
Scandium	<0.002	mg/L	-	7/17/98
Selenium	<0.048	mg/L	0.05	7/17/98
Silver	<0.005	mg/L	0.1	7/17/98
Sodium	140	mg/L	-	7/17/98
Strontium	0.199	mg/L	-	7/17/98
Sulfate	110	mg/L	250--500	7/17/98
Thallium	<0.001	mg/L	0.002	7/10/98
Tin	<0.038	mg/L	-	7/17/98
Titanium	<0.003	mg/L	-	7/17/98
TDS	505	mg/L	500--1000	7/08/98
Vanadium	0.015	mg/L	-	7/17/98
WAD Cyanide	<0.01	mg/L	0.2	7/15/98
Zinc	<0.004	mg/L	5.0	7/17/98
CO3, CaCO3	21.5	mg/L Ext		7/10/98
Alkalinity (HCO3)	102	mg/L Ext		7/10/98

Sample Receipt: 7/05/98
SVL JOB No.: 81769
SVL SAMPLE No.:177083
Matrix: ESOIL
Extraction: MWMP

MWMP EXTRACTION PARAMETERS

Extraction Fluid pH: 5.91
Final fluid pH: 8.99
Sample Weight: 5053.5g

Feed Moisture: 1.07 %
Retained Moisture: 10.30 %
Extraction Time: 26 Hrs
Extraction Type:
SINGLE PASS COLUMN

Analytical Results are for EXTRACT

Acid/Base Accounting:

Paste pH: 8.69
AGP: <0.3 *
ANP: 716 *
ABP: + 716 *
*Tons CaCO3/kTon Material

Sulfur Forms:

TOTAL: <0.01 %
PYRITIC: <0.01 %
SULFATE: <0.01 %
NON-EXT: <0.01 %

CATION SUM: 8.46 meq/L
ANION SUM: 8.41 meq/L
C/A BALANCE: 0.30 %

Reviewed By: Bill Johnson Date 7/20/98
7/20/98 23:29

JUL-20-98 15:01 From:SVL ANALYTICAL +2067830851 T-834 P.06/25 Job-315

Wood Canyon #1

L ANALYTICAL, INC.

ernment Gulch * P.O. Box 929 * Kellogg, Idaho 83837-0929 * Phone: (208)784-1258 * Fax: (208)783-0851

NDEP PROFILE II REPORT MWMT

MARIGOLD MINING COMPANY

RWRD98-WCFQPS Sampled: 4/19/98 4:15

PARAMETERS	RESULTS	UNITS	STANDARDS	DATE
Alkalinity (Total)	93.8	mg/L	-	7/10/98
Aluminum	0.042	mg/L	0.05--0.2	7/17/98
Antimony	<0.002	mg/L	0.006	7/16/98
Arsenic	<0.04	mg/L	0.05	7/17/98
Barium	0.008	mg/L	2.0	7/17/98
Beryllium	<0.002	mg/L	0.004	7/17/98
Bismuth	<0.027	mg/L	- -	7/17/98
Boron		mg/L	-	
Cadmium	0.004	mg/L	0.005	7/17/98
Calcium	9.07	mg/L	-	7/17/98
Chloride	5.0	mg/L	250--400	7/17/98
Chromium	<0.008	mg/L	0.1	7/17/98
Cobalt	<0.003	mg/L	-	7/17/98
Copper	<0.006	mg/L	1.3	7/17/98
Fluoride	0.8	mg/L	2.0--4.0	7/17/98
Gallium	<0.033	mg/L	-	7/17/98
Iron	<0.019	mg/L	0.3--0.6	7/17/98
Lead	<0.001	mg/L	0.015	7/15/98
Lithium	0.022	mg/L	-	7/17/98
Magnesium	8.10	mg/L	125--150	7/17/98
Manganese	0.002	mg/L	0.05--0.1	7/17/98
Mercury	<0.0002	mg/L	0.002	7/16/98
Molybdenum	0.094	mg/L	-	7/17/98
Nickel	<0.016	mg/L	0.1	7/17/98
Nitrate as N	0.83	mg/L	10.0	7/17/98
pH (units)	8.71	S.U.	6.5--8.5	7/10/98
Phosphorous	1.55	mg/L	-	7/17/98
Potassium	27.5	mg/L	-	7/17/98
Scandium	<0.002	mg/L	-	7/17/98
Selenium	<0.048	mg/L	0.05	7/17/98
Silver	<0.005	mg/L	0.1	7/17/98
Sodium	12.0	mg/L	-	7/17/98
Strontium	0.146	mg/L	-	7/17/98
Sulfate	7.2	mg/L	250--500	7/17/98
Thallium	<0.001	mg/L	0.002	7/10/98
Tin	<0.038	mg/L	-	7/17/98
Titanium	0.005	mg/L	-	7/17/98
TDS	143	mg/L	500--1000	7/08/98
Vanadium	<0.007	mg/L	-	7/17/98
WAD Cyanide	<0.01	mg/L	0.2	7/15/98
Zinc	<0.004	mg/L	5.0	7/17/98
CO3, CaCO3	7.0	mg/L Ext		7/10/98
Alkalinity (HCO3)	86.8	mg/L Ext		7/10/98

Sample Receipt: 7/05/98
SVL JOB No.: 81769
SVL SAMPLE No.:177081
Matrix: ESOIL
Extraction: MWM

MWM EXTRACTION PARAMETERS

Lixiviant pH: 5.91
Final fluid pH: 8.71
Sample Weight: 5.0000kg
% passing 200#: 39.60 %
% Moisture: 0.25 %
H2O to Saturate: 928.0 ml
Extraction Time: 24 Hrs
Extraction Type:
ROTATING EXTRACTOR

Analytical Results are for EXTRACT

Acid/Base Accounting:

Paste pH: 8.75
AGP: <0.3 *
ANP: 55.6 *
ABP: + 55.6 *
*Tons CaCO3/kTon Material

Sulfur Forms:

TOTAL: <0.01 %
PYRITIC: <0.01 %
SULFATE: <0.01 %
NON-EXT: <0.01 %

CATION SUM: 2.34 meq/L
ANION SUM: 2.26 meq/L
C/A BALANCE: 1.74 %

SAMPLE NOT SUITABLE FOR COLUMN LEACH DUE TO THE FNELY DIVIDED SOLIDS

Reviewed By: Blake Johnson Date 7/20/98

7/20/98 9:49

JUL-20-98 15:01 From:SVL ANALYTICAL +2087630691 T-834 P.03/25 Job-915

COCANYON #2

L ANALYTICAL, INC.

Government Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

NDEP PROFILE II REPORT MWMT

MARIGOLD MINING COMPANY

RWRD98-WCFQ Sampled: 4/07/98 4:15

PARAMETERS	RESULTS	UNITS	STANDARDS	DATE
Alkalinity (Total)	113	mg/L	-	7/10/98
Aluminum	<0.037	mg/L	0.05--0.2	7/17/98
Antimony	0.003	mg/L	0.006	7/16/98
Arsenic	<0.04	mg/L	0.05	7/17/98
Barium	0.278	mg/L	2.0	7/17/98
Beryllium	<0.002	mg/L	0.004	7/17/98
Bismuth	<0.027	mg/L	-	7/17/98
Boron		mg/L	-	
Cadmium	<0.002	mg/L	0.005	7/17/98
Calcium	2.05	mg/L	-	7/17/98
Chloride	13.3	mg/L	250--400	7/17/98
Chromium	<0.008	mg/L	0.1	7/17/98
Cobalt	<0.003	mg/L	-	7/17/98
Copper	<0.004	mg/L	1.3	7/17/98
Fluoride	0.9	mg/L	2.0--4.0	7/17/98
Gallium	<0.033	mg/L	-	7/17/98
Iron	<0.019	mg/L	0.3--0.6	7/17/98
Lead	<0.001	mg/L	0.015	7/15/98
Lithium	0.010	mg/L	-	7/17/98
Magnesium	2.40	mg/L	125--150	7/17/98
Manganese	<0.001	mg/L	0.05--0.1	7/17/98
Mercury	<0.0002	mg/L	0.002	7/16/98
Molybdenum	0.073	mg/L	-	7/17/98
Nickel	<0.016	mg/L	0.1	7/17/98
Nitrate as N	0.35	mg/L	10.0	7/17/98
pH (units)	8.86	S.U.	6.5--8.5	7/10/98
Phosphorous	0.97	mg/L	-	7/17/98
Potassium	25.0	mg/L	-	7/17/98
Scandium	<0.002	mg/L	-	7/17/98
Selenium	<0.048	mg/L	0.05	7/17/98
Silver	<0.005	mg/L	0.1	7/17/98
Sodium	52.0	mg/L	-	7/17/98
Strontium	0.032	mg/L	-	7/17/98
Sulfate	20.6	mg/L	250--500	7/17/98
Thallium	<0.001	mg/L	0.002	7/10/98
Tin	<0.038	mg/L	-	7/17/98
Titanium	<0.003	mg/L	-	7/17/98
TDS	216	mg/L	500--1000	7/08/98
Vanadium	<0.007	mg/L	-	7/17/98
WAD Cyanide	<0.01	mg/L	0.2	7/15/98
Zinc	0.011	mg/L	5.0	7/17/98
CO3, CaCO3	10.8	mg/L Ext		7/10/98
Alkalinity (ECO3)	102	mg/L Ext		7/10/98

Sample Receipt: 7/05/98
SVL JOB No.: 81769
SVL SAMPLE No.: 177082
Matrix: ESOIL
Extraction: MWM

MWM EXTRACTION PARAMETERS

Lixiviant pH: 5.91
Final fluid pH: 8.86
Sample Weight: 5.0000kg
% passing 200#: 41.20 %
% Moisture: 0.45 %
H2O to saturate: 1240.0 ml
Extraction Time: 24 Hrs
Extraction Type:
ROTATING EXTRACTOR

Analytical Results are for EXTRACT

Acid/Base Accounting:

Paste pH: 8.91
AGP: <0.3 *
ANP: 18.5 *
ABP: + 18.5 *
*Tons CaCO3/kTon Material

Sulfur Forms:

TOTAL: <0.01 %
PYRITIC: <0.01 %
SULFATE: <0.01 %
NON-EXT: <0.01 %

CATION SUM: 3.20 meq/l
ANION SUM: 3.14 meq/l
C/A BALANCE: 0.95 %

SAMPLE NOT SUITABLE FOR COLUMN LEACH DUE TO THE FINELY DIVIDED SOLIDS

Reviewed By: Blake Johnson Date 7/20/98
7/20/98 9:49

JUL-20-98 15:02 From:SVL ANALYTICAL +2087830891 T-834 P.11/25 Job-315

ROSCOCANYON #3

ANALYTICAL, INC.

Fremont Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0991

NDEP PROFILE II REPORT MWMT

MARIGOLD MINING COMPANY

RWRD98-WCFSDS Sampled: 5/14/98 4:15

ARAMETERS	RESULTS	UNITS	STANDARDS	DATE
lkalinity (Total)	121	mg/L	-	7/10/98
luminum	0.178	mg/L	0.05--0.2	7/17/98
Antimony	0.003	mg/L	0.006	7/16/98
Arsenic	<0.04	mg/L	0.05	7/17/98
Barium	0.031	mg/L	2.0	7/17/98
Beryllium	<0.002	mg/L	0.004	7/17/98
Bismuth	<0.027	mg/L	-	7/17/98
Boron		mg/L	-	
Cadmium	0.004	mg/L	0.005	7/17/98
Calcium	4.23	mg/L	-	7/17/98
Chloride	50.4	mg/L	250--400	7/17/98
Chromium	<0.008	mg/L	0.1	7/17/98
Cobalt	<0.003	mg/L	-	7/17/98
Copper	<0.004	mg/L	1.3	7/17/98
Fluoride	1.4	mg/L	2.0--4.0	6/11/98
Gallium	<0.033	mg/L	-	7/17/98
Iron	0.106	mg/L	0.3--0.6	7/17/98
ad	0.002	mg/L	0.015	7/15/98
thium	0.069	mg/L	-	7/17/98
agnesium	2.70	mg/L	125--150	7/17/98
Manganese	0.014	mg/L	0.05--0.1	7/17/98
Mercury	<0.0002	mg/L	0.002	7/16/98
Molybdenum	0.176	mg/L	-	7/17/98
Nickel	<0.016	mg/L	0.1	7/17/98
Nitrate as N	0.07	mg/L	10.0	7/17/98
pH (units)	9.05	S.U.	6.5--8.5	7/10/98
Phosphorous	0.88	mg/L	-	7/17/98
Potassium	31.8	mg/L	-	7/17/98
Scandium	<0.002	mg/L	-	7/17/98
Selenium	<0.048	mg/L	0.05	7/17/98
Silver	<0.005	mg/L	0.1	7/17/98
Sodium	94.6	mg/L	-	7/17/98
Strontium	0.199	mg/L	-	7/17/98
Sulfate	62.4	mg/L	250--500	7/17/98
Thallium	<0.001	mg/L	0.002	7/10/98
Tin	<0.038	mg/L	-	7/17/98
Titanium	<0.003	mg/L	-	7/17/98
TDS	337	mg/L	500--1000	7/08/98
Vanadium	<0.007	mg/L	-	7/17/98
WAD Cyanide	<0.01	mg/L	0.2	7/15/98
Zinc	<0.004	mg/L	5.0	7/17/98
CO3, CaCO3	19.7	mg/L Ext		7/10/98
Alkalinity (HCO3)	102	mg/L Ext		7/10/98

Sample Receipt: 7/05/98
SVL JOB No.: 81769
SVL SAMPLE No.:177084
Matrix: ESOIL
Extraction: MWM

MWM EXTRACTION PARAMETERS

Lixiviant pH: 5.91
Final fluid pH: 9.05
Sample Weight: 5.0000kg
% passing 200#: 23.00 %
% Moisture: 0.36 %
H2O to saturate: 912.0 ml
Extraction Time: 24 Hrs
Extraction Type:
ROTATING EXTRACTOR

Analytical Results are for EXTRACT

Acid/Base Accounting:

Paste pH: 8.75
AGP: <0.3 *
ANP: 16.9 *
ABP: + 16.9 *
*Tons CaCO3/kTon Material

Sulfur Forms:

TOTAL: <0.01 %
PYRITIC: <0.01 %
SULFATE: <0.01 %
NON-EXT: <0.01 %

CATION SUM: 5.39 meg/L
ANION SUM: 5.50 meg/L
C/A BALANCE: -1.01 %

SAMPLE NOT SUITABLE FOR COLUMN LEACH DUE TO THE FINELY DIVIDED SOLIDS

Reviewed By: Blake Johnson Date 7/20/98
7/20/98 9:49

JUL-20-98 15:00 From:SVL ANALYTICAL +2087630891 T-834 P.07/25 Job-915

KEPLING
ANALYTICAL, INC.
ernment Gulch ■ P.O. Box 929 ■ Kellogg, Idaho 83837-0929 ■ Phone: (208)784-1258 ■ Fax: (208)783-0891

NDEP PROFILE II REPORT MWMP
MARIGOLD MINING COMPANY
RWRD98-SFQ sampled: 6/25/98

PARAMETERS	RESULTS	UNITS	STANDARDS	DATE
lkalinity (Total)	29.8	mg/L	-	7/10/98
luminum	0.089	mg/L	0.05--0.2	7/17/98
Antimony	<0.002	mg/L	0.006	7/16/98
rsenic	<0.04	mg/L	0.05	7/17/98
Barium	0.011	mg/L	2.0	7/17/98
Beryllium	<0.002	mg/L	0.004	7/17/98
Bismuth	<0.027	mg/L	- -	7/17/98
Boron		mg/L	-	
Cadmium	<0.002	mg/L	0.005	7/17/98
Calcium	8.93	mg/L	-	7/17/98
Chloride	0.8	mg/L	250--400	7/17/98
Chromium	<0.008	mg/L	0.1	7/17/98
Cobalt	<0.003	mg/L	-	7/17/98
Copper	<0.004	mg/L	1.3	7/17/98
Fluoride	<0.1	mg/L	2.0--4.0	7/17/98
Gallium	<0.033	mg/L	-	7/17/98
ron	<0.019	mg/L	0.3--0.6	7/17/98
ead	<0.001	mg/L	0.015	7/15/98
ithium	<0.005	mg/L	-	7/17/98
Magnesium	0.859	mg/L	125--150	7/17/98
Manganese	0.003	mg/L	0.05--0.1	7/17/98
Mercury	<0.0002	mg/L	0.002	7/16/98
Molybdenum	<0.003	mg/L	-	7/17/98
Nickel	<0.016	mg/L	0.1	7/17/98
Nitrate as N	0.23	mg/L	10.0	7/17/98
pH (units)	8.38	s.u.	6.5--8.5	7/10/98
Phosphorous	<0.11	mg/L	-	7/17/98
Potassium	2.9	mg/L	-	7/17/98
Scandium	<0.002	mg/L	-	7/17/98
Selenium	<0.048	mg/L	0.05	7/17/98
Silver	<0.005	mg/L	0.1	7/17/98
Sodium	1.40	mg/L	-	7/17/98
Strontium	0.039	mg/L	-	7/17/98
Sulfate	1.9	mg/L	250--500	7/17/98
Thallium	<0.001	mg/L	0.002	7/10/98
Tin	<0.038	mg/L	-	7/17/98
Titanium	<0.003	mg/L	-	7/17/98
TDS	44	mg/L	500--1000	7/08/98
Vanadium	<0.007	mg/L	-	7/17/98
WAD Cyanide	<0.01	mg/L	0.2	7/15/98
Zinc	<0.004	mg/L	5.0	7/17/98
CO3, CaCO3	<1.0	mg/L Ext		7/10/98
Alkalinity (HCO3)	29.1	mg/L Ext		7/10/98

Sample Receipt: 7/05/98
SVL JOB No.: 81769
SVL SAMPLE No.:177080
Matrix: ESOIL
Extraction: MWMP

MWMP EXTRACTION PARAMETERS

Extraction Fluid pH: 5.91
Final fluid pH: 8.38
Sample Weight: 5000.0g

Feed Moisture: 0.00 %
Retained Moisture: 4.06 %
Extraction Time: 25 Hrs
Extraction Type:
SINGLE PASS COLUMN

Analytical Results
are for EXTRACT

Acid/Base Accounting:

Paste pH: 8.85
AGP: <0.3 *
ANP: 1.5 *
ABP: + 1.5 *
*Tons CaCO3/kTon Material

Sulfur Forms:

TOTAL: <0.01 %
PYRITIC: <0.01 %
SULFATE: <0.01 %
NON-EXT: <0.01 %

CATION SUM: 0.66 meq/L
ANION SUM: 0.68 meq/L
C/A BALANCE: -1.49 %

Reviewed By: Bob Johnson Date 7/20/98
7/20/98 13:36

Canyon Resources Corporation
Reward Project

Supplemental waste rock geochemistry data:

Initial Reward project waste rock geochemistry data was submitted to the United States Department of the Interior Bureau of Land Management Las Vegas Field Office (BLM) and the Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) in 1998 in conjunction with permitting of the project by Glamis Daisy Mining Company (Glamis) and its predecessor companies. This information was included in Canyon Resources Corporation's (Canyon) Mining Plan of Operations/Reclamation Plan and Reclamation Permit application submitted to BLM and BMRR in November 2006.

To confirm and supplement the 1998 data, Canyon identified eleven samples from select intervals within select exploration drill holes from Canyon's October 2006 exploration drilling program. The identified samples were representative of waste rock material expected to be encountered during mining operations at the Reward project. The selected samples were identified by Canyon's contract geologist Bill R. Fleshman, C.P. GeolAusIMM using criteria to not only represent the various rock units and geologic Formations, but also to spatially be representative of waste material. In other words, waste material that would be encountered at various elevations and also along the strike of the pit. The waste rock will be predominately quartzite, schist, dolomite and limestone.

The following table contains the spatial coordinates of each sample and also the work order number assigned by ALSChemex, who performed assay work on the bulk samples.

HOLE #	FROM	TO	FORMATION	LITHOLOGY	X LOCATION	Y LOCATION	Z LOCATION	SECTION	WORK ORDER
RC-18	20	35	Wood Canyon	quartzite	65804	6140	4197	6100N	RE06099266
RC-17	30	40	Wood Canyon	quartzite	65580	5400	4350	5400N	RE06099265
RC-16	75	80	Wood Canyon	schist/quartzite	65974	4900	4147	4900N	RE06096571
RC-16	125	130	Wood Canyon	quartzite	65987	4900	4099	4900N	RE06096571
RC-09	10	20	Wood Canyon	dolomite	66260	4400	4080	4400N	RE06091381
RC-09	235	240	Wood Canyon	quartzite	66260	4400	3855	4400N	RE06091381
RC-15	170	180	Wood Canyon	quartzite	66035	4800	4030	4800N	RE06096570
RC-10	75	80	Juhl	quartzite	65962	4500	4020	4020N	RE06095575
RC-08	50	60	Juhl	quartzite	65995	4400	4011	4400N	RE06091380
RC-06	125	130	Wood Canyon	quartzite	66117	4200	3906	4200N	RE06091008
RC-01	10	15	Bonanza King	limestone	66518	4100	4000	4100N	RE06089185

Canyon contracted with Western Environmental Testing Laboratory (WETLab) to analyze Meteoric Water Mobility Procedure (MWMP) effluent from splits of the bulk samples identified in the table above. WETLab subcontracted acid-base accounting for the samples to Green Analytical Laboratories, Inc. Results of the laboratory analyses are provided on the following table. Copies of the original laboratory Analytical Reports will be provided upon Agency request.

Summary

Of the eleven samples from Canyon's October program analyzed for acid-base accounting, ten samples returned acid-base potential values ranging from 11.0 tons/1,000 tons (t/kt) $CaCO_3$ to 316 t/kt $CaCO_3$. One sample, of the Juhl Quartzite Member (sometimes referred to as the Lower Sterling Formation) of the Sterling Formation and collected from a five-foot interval located at a depth of 75'-80' below ground surface (bgs) in hole RC-10, returned what could be considered an anomalous neutralizing potential of -0.36 t/kt $CaCO_3$ relative to the reported Total S and acid potential for this sample compared to the other ten samples. It is noted that the Glamis acid/base accounting results from analyses of the Sterling Formation indicated a lower ANP and ratio of ANP:AGP than analyses from other formations. However, the Glamis ANP:AGP ratio still indicated ANP:AGP a ratio than 3.0.

In summary, none of the waste rock units have an acid neutralizing to acid generating ratio less than three (3.0). The analytical results for the specific sample from the Juhl Quartzite Member of the Sterling Formation could be considered anomalous, even when compared with other analytical results from the Sterling Formation. This interval possibly exhibited some local secondary silicification encapsulating weak mineralization. The Juhl-Wood Canyon contact is mineralized over five to ten feet in some previous Reward project exploration holes; therefore, the sampled interval in Canyon hole RC-10 may have intercepted the contact.

NDEP guidelines suggest that any material with an AGP/ANP ratio of less than 1.2 may be potentially acid generating. Therefore, acid generation from Reward project waste rock is unlikely. The project is located in a low precipitation/high evaporation area. Therefore, drainage from infiltrating meteoric water through the waste rock dumps is not projected to occur. No groundwater or springs have been identified during reconnaissance and condemnation drilling in the entire Reward project area.

Canyon Resources Corporation
Reward Project
Supplemental Waste Rock Geochemistry Data

Sample Location (including interval & geologic formation)		RC-16 (0-40 Wood Canyon)	RC-17 (0-40 Wood Canyon)	RC-18 (0-40 Wood Canyon)	RC-19 (0-40 Wood Canyon)	RC-20 (0-20 Wood Canyon)	RC-20 (20-40 Wood Canyon)	RC-15 (70-80 Wood Canyon)	RC-10 (Alluvium)	RC-08 (0-40 Wood Canyon)	RC-06 (0-40 Wood Canyon)	RC-01 (0-15 Bonanza)
NDEP Profile II analysis of MWMP Rules												
Name of Certified Lab	Standards	WETLAB	WETLAB	WETLAB	WETLAB	WETLAB	WETLAB	WETLAB	WETLAB	WETLAB	WETLAB	WETLAB
Lab Reference #	Units*	611-133-1	611-133-2	611-133-3	611-133-4	611-133-5	611-133-6	611-133-7	611-133-8	611-133-9	611-133-10	611-133-11
Sample Date		Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified
Lab Test Date		12/4/2006	12/4/2006	12/4/2006	12/4/2006	12/4/2006	12/4/2006	12/4/2006	12/4/2006	12/4/2006	12/4/2006	12/4/2006
Sampled By		Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified
Depth to Water		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Groundwater Elevation		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Alkalinity (Total as $CaCO_3$)	-	290	190	240	190	130	200	200	70	150	120	30
Alkalinity (CO_3, $CaCO_3$)	-	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported	Not Reported
Bicarb (HCO_3)	-	290	190	320	190	130	210	200	90	170	200	100
Aluminum	0.05-0.20	0.29	2.2	0.76	0.21	<0.045	<0.065	1.2	0.4	0.075	0.27	<0.045
Antimony	0.003	0.0071	0.0069	0.006	0.0064	0.0055	<0.0055	0.0028	0.0015	0.0077	0.0047	0.13
Arsenic	0.05	0.045	<0.005	<0.005	<0.005	0.0050	<0.005	<0.005	0.038	0.025	0.025	0.0044
Barium	2	0.02	0.028	0.1	0.047	0.11	0.049	0.092	0.087	0.1	0.077	0.011
Beryllium	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	-	0.18	0.11	0.19	0.2	0.19	0.3	0.2	0.27	<0.1	0.42	0.54
Cadmium	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium	-	27	15	45	30	5.1	33	18	8.3	7.4	8.2	7.2
Chromium	350-400	110	38	47	58	12	63	45	20	8.3	58	37
Chromium	0.1	0.014	<0.005	0.12	0.054	<0.005	<0.005	0.12	<0.005	<0.005	0.004	<0.005
Cobalt	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	1.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoride	2.4	1.3	4	3.3	1.8	0.49	1.8	3.2	0.85	0.57	3.4	0.61
Gallium	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Iron	0.3-0.6	0.98	2.79	0.74	0.53	<0.01	<0.01	<0.06	0.34	0.072	1	<0.01
Lead	0.015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lithium	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.47
Magnesium	125-150	4.2	1.3	5.6	4.6	1.9	8.7	2.8	2.3	1.4	1.9	3.3
Manganese	0.05-0.10	0.039	0.015	0.043	0.015	<0.005	0.027	0.008	0.021	0.017	0.005	<0.005
Mercury	0.002	0.00012	0.00021	0.006	0.028	0.0001	<0.0001	0.0035	0.0001	0.0004	0.0002	0.00025
Molybdenum	-	<0.01	0.014	0.1	0.12	0.003	0.046	0.15	0.033	0.016	0.14	0.025
Nickel	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (@ 13A+102 as N)	10	2.4	2.5	3	3.4	2.1	2.5	2.1	2.3	2.5	2.3	2.3
pH	6.5-8.5	8.57	8.55	8.68	8.46	8.83	8.64	8.72	8.04	8.09	8.57	7.95
Phosphorus	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<3.5	<0.5	<0.5	<0.5
Potassium	-	27	57	60	46	26	85	45	10	12	28	15
Selenium	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silver	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silver	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.023	<0.005
Sodium	-	160	34	170	130	29	60	130	46	23	120	54
Strontium	-	0.14	<0.1	0.87	0.35	<0.1	0.4	0.25	<0.1	<0.1	0.17	<0.1
Sulfate	250-500	140	38	220	24	30	580	190	44	27	65	33
Thallium	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tin	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Dissolved Solids	500-1000	720	440	1100	490	280	1100	520	300	170	500	300
Vanadium	-	0.025	<0.01	0.104	0.023	0.004	0.04	0.016	<0.01	<0.01	<0.01	<0.01
WAD Cyanide	0.2	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Zinc	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acid-Base Accounting												
Name of Certified Lab		GAL	GAL	GAL	GAL	GAL	GAL	GAL	GAL	GAL	GAL	GAL
Lab Reference #		611-115-01	611-115-02	611-115-03	611-115-04	611-115-05	611-115-06	611-115-07	611-115-08	611-115-09	611-115-10	611-115-11
Sample Date												
Lab Test Date												
Total S %		0.018	0.042	0.008	0.029	0.007	0.052	0.010	0.008	0.003	0.008	0.016
Acid Potential (TNP100%)		9.3	1.32	9.29	0.19	0.69	1.67	<0.09	0.29	<0.25	0.29	0.30
Neutralizing Potential (TNP100%)		59.3	12.3	38.8	16.2	66.3	52.9	42.4	0.36	14.4	18.6	3.16
Acid-Base Potential (TNP100%)		50.0	11.0	29.0	16.0	66.3	50.9	46.1	0.53	14.2	18.3	3.16
% $CaCO_3$		5.93	1.32	3.893	1.629	6.628	5.293	4.705	0.036	1.443	1.829	0.316

*Standard units (where applicable, for comparison only)
Comments:
Values are analyzed and reported as received

APPENDIX C
Photographs of the Elizalde Company Complex Ruins

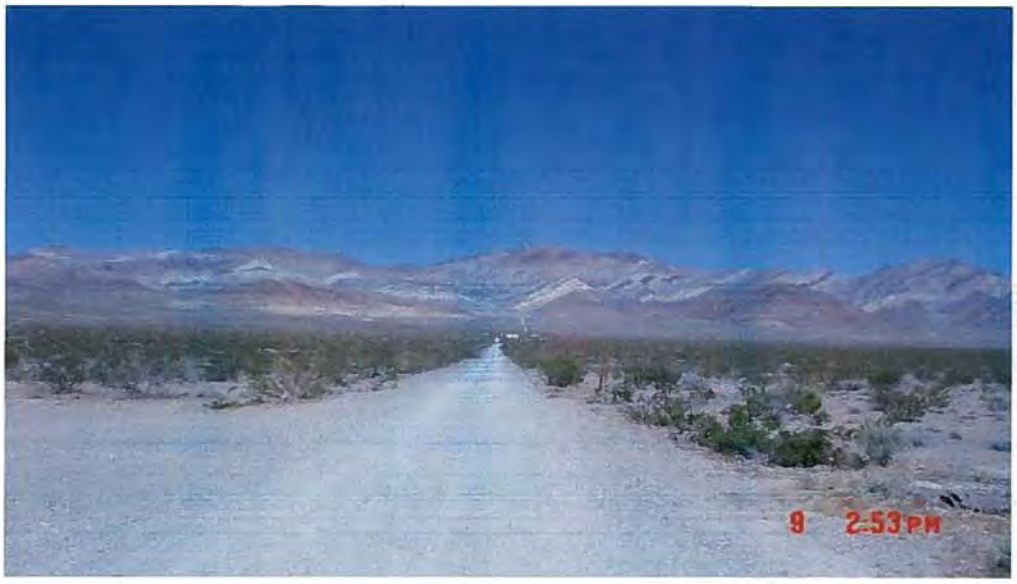

Photo by Wendy Seley, Realty Specialist

April 9, 2008

T. 13 S., R. 47 E., section 16, NW1/4, looking northeast from US Highway 95 towards ruins

Carrara Ruins – Cement Plant located in section 9, SE1/4 0.8 miles from US 95

9 2:56 PM

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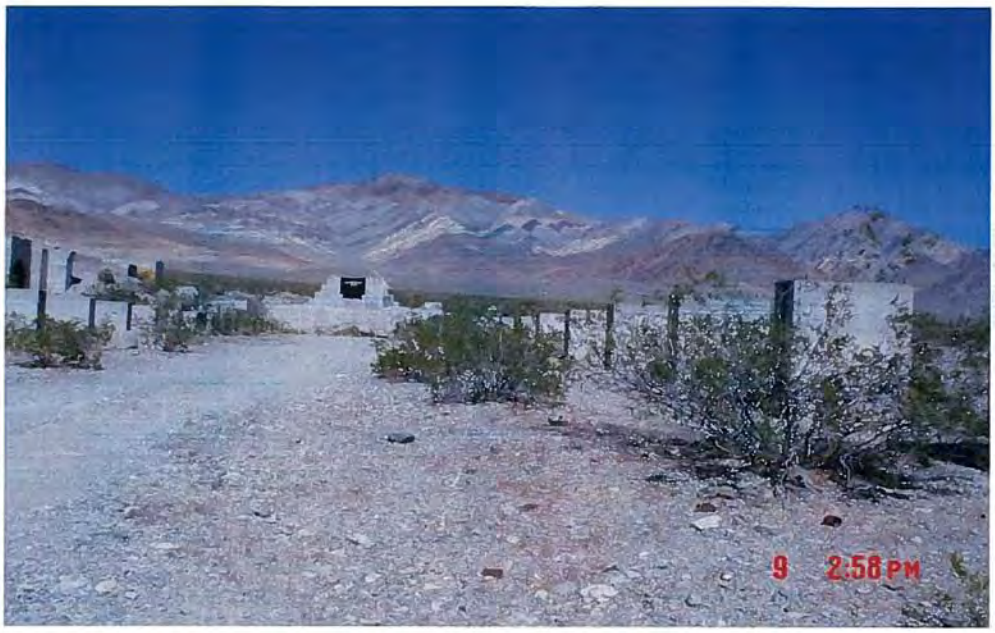
9 3:01PM

8 3:02PM


9 2:58 PM

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APPENDIX D
Noxious Weed Risk Assessment
And
Reward Mine Project Noxious Weed Plan

NOXIOUS WEEDS RISK ASSESSMENT

1. **Project Name:** Canyon Resources - Reward Mine **NEPA LV No. 2007-295**

2. **Date Risk Assessment was completed**: September 24, 2008

3. **Describe steps taken to complete Risk Assessment:** Reviewed the baseline report which summarized the vegetation and noxious weeds present on the Project site. Also conducted an on-site tour of the areas to be disturbed. The Nevada State Noxious Weed List was reviewed to be sure all species were addressed.

4. **Project Description:** Canyon Resources Corporation proposes to open a new gold mine near Beatty, Nevada that will disturb a total of 287 acres in a five to ten year period. The project will consist of an open pit, heap leach pad and ponds, mine dumps, a rock crushing facility, office area, access and haulage roads, and a water well with pipeline

5. Project Location: The Reward Project is located eight miles southeast of Beatty, Nevada and three miles east of US Highway 95. The site is located on the western flank of the Bare Mtns. All or portions of: T. 12 S, R. 47 E, Secs. 33, 34, 35; T. 13 S, R. 47 E, Secs. 1-4, 9, 10, 11, 16.

6. Factor 1 assesses the likelihood of noxious/invasive weed species spreading to the project area. For this project, the factor rates as **LOW, (2):** at the present time. This rating was based on the following findings: Noxious/invasive weed species present in areas adjacent to but not within the project area. Project activities can be implemented and prevent the spread of noxious/invasive weeds into the project area. Tamarisk (saltcedar) is known to occur in the Amargosa River drainage, three miles from the Project.

7. Factor 2 assesses the consequences of noxious/invasive weed establishment in the project area. For this project, the factor rates as **MODERATE, (5):** Possible adverse effects on site and possible expansion of infestation within the project area. Cumulative effects on native plant communities are likely, but limited. Any areas associated with surface or near surface soil moisture are likely locations for tamarisk to establish.

8. Factor 1 * Factor 2 = **Risk Rating: LOW, (10)**: Proceed as planned. Initiate control treatment on noxious weed populations that get established in the area.

9. Based on this risk rating, preventative management measures **are** needed for this project. Preventative management measures developed for this project are as follows:

> 1. At the onset of project planning in the NEPA analysis phase, the project proponent, project lead or the LVFO noxious weed coordinator shall complete the Risk Assessment Form for Noxious/Invasive Weeds. This will provide information about the types of weed surveys to be conducted, the methods of weed treatments and weed prevention schedules for the management of noxious weeds on the project footprint. This will identify the level of noxious weed management necessary. If pesticides are proposed then follow the pesticide stipulation below.
>
> 2. The project proponent shall coordinate project activities with the BLM Weed Coordinator (702-515-5000) regarding any proposed herbicide treatment. The project proponent shall prepare, submit, obtain and maintain a pesticide use proposal (PUP) for the proposed action.

3. Before ground-disturbing activities begin, the project proponent shall review the weed risk assessment and prepare a weed management plan that will inventory and prioritize weed infestations for treatment within the project foot print. Should the weed spread beyond the project foot print then these weeds will be treated as a part of the project. This will include access routes.

4. The project proponent shall limit the size of any vegetation and/or ground disturbance to the absolute minimum necessary to perform the activity safely and as designed. The project proponent will avoid creating soil conditions that promote weed germination and establishment.

5. The project proponent shall begin project operations in weed free areas whenever feasible before operating in weed-infested areas.

6. The project proponent shall locate equipment storage, machine and vehicle parking or any other area needed for the temporary placement of people, machinery and supplies in areas that are relatively weed-free. The project proponent shall avoid or minimize all types of travel through weed-infested areas or restrict major activities to periods of time when the spread of seed or plant parts are least likely.

7. BLM or the project proponent shall determine equipment-cleaning sites (if equipment is infested with weed seeds, plant parts or mud and dirt). Project related equipment and machinery (this especially includes the nooks and crannies of undercarriages) will be cleaned using compressed air or water to remove mud, dirt and plant parts before moving into and from relatively weed-free areas. Seeds and plant parts will be collected, bagged and deposited in dumpsters destined for local landfills, when practical.

8. Project workers shall inspect, remove, and dispose of weed seed and plant parts found on their clothing and personal equipment, bag the product and dispose of in a dumpster for deposit in local landfills. Disposal methods may vary depending on the project. If you have questions consult with the LVFO Noxious Weed Coordinator.

9. The project proponent shall evaluate options, including area closures, to regulate the flow of traffic on sites where native vegetation needs to be established.

10. Based on this risk rating, project modifications **are not** needed for this project.

Weed Risk Assessment completed by: Gary N. Back, Ecologist, Great Basin Ecology, Inc.

Reviewed by/Date Reviewed: _____ Date: _____
(Noxious Weed Coordinator)

Reward Mine Project Noxious Weed Plan

N-82840

1.0 INTRODUCTION

1.1 Plan Purpose

The purpose of this plan is to describe methods to prevent and control the spread of noxious weeds during the construction, operation, and post-mining reclamation of the Canyon Resources Reward Corporation's (CRRC) Reward Mine (Project). CRRC and its contractors will be responsible for carrying out the methods described in this plan. This plan addresses only the actions permitted under CFR 3809 by the Bureau of Land Management (BLM) to CRRC for construction and operation of the Project.

1.2 Goals and Objectives

Noxious weeds are defined by law as detrimental or destructive and difficult to control or eradicate. A noxious weed is a plant that has been defined as a pest by law or regulation. Both Nevada and the federal government maintain lists of noxious weeds. The goal of noxious weed control is to implement preventive measures to minimize the spread of noxious weeds during construction and operation of the proposed facilities. Monitoring and maintenance during the construction, operational, and closure/reclamation phases will include identification of any local infestation areas on and adjacent to the Project that may pose potential infestation.

1.3 Project Description

CRRC proposes to open a new gold mine near Beatty, Nevada that will disturb a total of 287 acres in a five to ten year period. The project will consist of an open pit, heap leach pad and ponds, mine dumps, a rock crushing facility, office area, access and haulage roads, and a water well with pipeline.

The Reward Project is located eight miles southeast of Beatty, Nevada and three miles east of US Highway 95. The site is located on the western flank of the Bare Mountains, on all or portions of: T. 12 S, R. 47 E, Secs. 33, 34, 35; T. 13 S, R. 47 E, Secs. 1-4, 9, 10, 11, 16 (Figure 1 and 2).

Although noxious weeds are not presently a concern in the project area, the Environmental Assessment for this project identified spread of invasive weeds as a potential environmental consequence of this project and identified several mitigation measures to reduce the potential for weeds to spread.

2.0 NOXIOUS WEED INVENTORY

Forty-seven species have officially been designated as noxious for the State of Nevada (http://agri.nv.gov/nwac/PLANT_NoxWeedList.htm). This Noxious Weed Plan was developed by preparing a Weed Risk Assessment and through consultation with the BLM Noxious Weed Coordinator. The entire project area was surveyed for noxious weeds. Additionally, any sensitive species located in the area and different vegetation communities were documented. No noxious weeds were observed within the Project area during field surveys conducted in 1999 and 2007. Saltcedar (*Tamarix* sp.) has been observed at the Amargosa Narrows (approximately five miles from the Project) where surface and near surface water is available.

However, the surface disturbing activities and the potential for wet soil locations to occur along the water supply pipeline, the potential exists for noxious weeds and other non-native invasive species to establish.

The preventive measures identified in Section 3.2 will be implemented along the pipeline route, access road, and all of the proposed facilities on federal lands to minimize the spread of noxious weeds during construction, operation, and closure/reclamation activities.

3.0 NOXIOUS WEED MANAGEMENT

Noxious weed identification, prevention and treatment measures are described in this section.

3.1 Identification of Problem Areas

Field surveys concluded that noxious weeds are not currently found within this project area. The following preventative measures will be implemented to ensure noxious weeds do not become introduced into the area. These preventative measures will also help prevent other invasive weeds from establishing.

3.2 Preventive Measures

Implementation of preventive measures to control the spread of noxious weeds is the most cost-effective management approach. CRRC will provide information and training to the construction contractors regarding noxious weed management, identification and potential impacts. The importance of preventing the spread of noxious weeds in areas not infested, and controlling the proliferation of noxious weeds already present, will be explained. If noxious weeds are observed after construction commences, appropriate herbicides will be applied upon BLM approval to any areas that may be identified with noxious weed infestations, to reduce the spread or proliferation of noxious weeds.

During construction, the following preventive measures will be implemented to prevent the spread of noxious weeds:

- All contractor vehicles and equipment will be cleaned prior to arrival at the work site using power or high-pressure equipment. The wash down will concentrate on tracks, feet, or tires and on the undercarriage, with special emphasis on axles, frame, cross members, motor mounts and on underneath steps, running boards and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles. The contractor, with construction inspector oversight, will ensure that vehicles and equipment are free of soil and debris capable of transporting noxious weed seeds, roots or rhizomes before the vehicles and equipment are allowed use of access roads;
- If areas of noxious weed infestation are identified after construction commences, they will be flagged in the field by CRRC staff. The flagging will alert construction personnel and prevent access into areas until noxious weed management control measures have been implemented;
- In areas where noxious weed infestations are identified or noted in the field, the contractor will stockpile cleared vegetation and salvaged topsoil adjacent to the area from which they are stripped to eliminate the transport of soil-borne noxious weed seeds, roots or rhizomes. During reclamation, the contractor will return topsoil and vegetative material from infestation sites to the areas from which they were stripped;
- If noxious weeds are identified on site, the contractor will use compressed air to remove seeds, roots, and rhizomes from the equipment before transport off site. Cleaning sites will be recorded using a Global Positioning System unit and this information will be reported to the local contact person or agency;
- The contractor will ensure that straw or hay bales used for sediment barrier installations or mulch distribution are obtained from state-cleared sources that are free of primary noxious weeds;
- Ground disturbance to vegetation will be limited to the absolute minimum necessary to perform the activity safely as designed. Activities that will create soil conditions that promote weed germination and establishment will be avoided whenever possible.
- Construction will begin in weed free areas whenever feasible before operating in weed-infested areas.

- The contractor will implement the reclamation of disturbed lands immediately following construction as outlined in the Plan of Operations and Reclamation Plan. Continuing reclamation efforts will ensure adequate vegetative cover to prevent the invasion of noxious weeds.
- Where clearing will occur the top 3-6 inches of topsoil will be salvaged and replaced following construction.

3.3 Treatment Methods

CRRC will implement noxious weed control measures in accordance with existing BLM regulations. In the event noxious weeds become established in the Project on federal lands after completion of construction, control measures may include one or more of the following methods:

- Treatment methods will be based on species-specific and area-specific conditions and will be coordinated with BLM;
- Disking or other mechanical treatments to remove noxious weeds which would disturb the soil surface will be avoided to the extent feasible. If necessary, subsequent seeding will be conducted to re-establish a desirable vegetative cover that will stabilize the soils and slow the potential re-invasion of noxious weeds. Seed selection will be based on site-specific conditions as identified in the Plan of Operations and Reclamation Plan; and
- Herbicide application may be used to reduce the size of noxious weed populations upon BLM approval.

4.0 MONITORING

4.1 Operational Monitoring

CRRC will conduct annual monitoring for noxious weeds, in conjunction with vegetation monitoring under the Plan of Operations and Reclamation Plan. Areas of noxious weed infestations will be noted. A report containing qualitative analysis and photo documentation will be submitted annually to BLM. Concurrent reclamation areas that are anticipated to require remediation activities will be identified. General recommendations and lessons learned will be provided.

CRRC will control noxious weeds on a case-by-case basis, and coordinate with BLM on treatment methods and performance standards. A summary of actions taken will be provided in the next annual monitoring report. CRRC personnel will attend noxious weed training, provided annually by BLM, to aid in the identification of noxious weed populations, and will report spread of noxious weeds during the normal course of maintenance.

4.2 Reclamation Monitoring

All reclaimed facilities will be monitored during the reclamation and post-reclamation period at least annually. This monitoring is to identify any infestations that become established on the reclaimed facilities and to allow timely implementation of noxious weed control measures.

If reclamation performance success standards are met within the time periods noted in the Plan of Operations and Reclamation Plan, or earlier if deemed appropriate, the reclaimed areas will be released from further monitoring. If performance success standards have not been met, negotiation with BLM for further remediation efforts will be sought at that time.

5.0 HERBICIDE APPLICATION, HANDLING, SPILLS, AND CLEANUP

5.1 Herbicide Application and Handling

Herbicide application will only be used if dense populations of noxious weeds develop within the Project on federal lands that affect the success criteria as established in the Plan of Operations and Reclamation Plan. Applications will be controlled to minimize the impacts on the surrounding vegetation. In areas of dense infestation, a broader application will be used and a follow-up seeding program implemented. Supplemental seeding will be based on the success criteria in the Plan of Operations and Reclamation Plan. The timing of subsequent reclamation efforts will be based on the life of the selected herbicide.

BLM's Draft Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS (BLM, 2005) details which herbicide active ingredients are approved for use on public lands in the western U.S. in order to control hazardous fuels and unwanted vegetation. A Nevada BLM Pesticide Use Proposal form will be submitted by CRRC prior to the use of herbicides on BLM lands and a Pesticide Application Record will be submitted after use (BLM, 2006).

Before herbicide application, CRRC or its contractor will obtain any required permits from the BLM. A licensed contractor will perform the application in accordance with applicable laws and regulations.

All herbicide applications will follow United States Environmental Protection Agency label instructions. Application of herbicides will be suspended when any of the following conditions exists:

- Wind velocity exceeds 6 miles per hour during application of liquids or 15 miles per hour during application of granular herbicides;
- Snow or ice covers the foliage of noxious weeds; or
- Precipitation is occurring or is imminent.

Vehicle-mounted sprayers (e.g., handgun, boom, and injector) will be used mainly in open areas that are readily accessible by vehicle. Hand application methods (e.g., backpack spraying) that target individual plants will be used to treat small or scattered noxious weed populations in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically to ensure that proper application rates are achieved.

Herbicides will be transported to the Project site daily with the following provisions:

- Only the quantity needed for that day's work will be transported;
- Concentrate will be transported in approved containers only and in a manner that will prevent tipping or spilling, and in a compartment that is isolated from food, clothing, and safety equipment;
- Mixing will be done off site and at a distance greater than 200 feet from open or flowing water, wetlands or other sensitive resources. No herbicides will be applied at these areas unless authorized by appropriate regulatory agencies; and
- All herbicide equipment and containers will be inspected for leaks daily.

5.2 Herbicide Spills and Cleanup

All reasonable precautions will be taken to avoid herbicide spills. In the event of a spill, cleanup will be immediate. Contractors will keep spill kits in their vehicles and in herbicide storage areas to allow for quick and effective response to spills. Items to be included in the spill kit are:

- Protective clothing and gloves;
- Adsorptive clay, "kitty litter," or other commercial adsorbent;
- Plastic bags and bucket;

- Shovel;
- Fiber brush and screw-in handle;
- Dust pan;
- Caution tape;
- Highway flares (use on established roads only); and
- Detergent.

Response to an herbicide spill will vary with the size and location of the spill, but general procedures include:

- Traffic control;
- Dressing the clean-up team in protective clothing;
- Stopping the leaks;
- Containing the spilled material;
- Cleaning up and removing the spilled herbicide and contaminated adsorptive material and soil; and
- Transporting the spilled herbicide and contaminated material to an authorized disposal site.

5.3 Worker Safety and Spill Reporting

All herbicide contractors will obtain and have readily available copies of the appropriate material safety data sheets for the herbicides used. All herbicide spills will be reported in accordance with applicable laws and requirements.

6.0 REFERENCES

Bureau of Land Management, 2005. Draft Programmatic Environmental Impact Statement on Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States. November.

Bureau of Land Management, 2006. Las Vegas Field Office Draft Noxious Weed Plan. September.

Nevada Department of Agriculture Noxious Weed List, accessed November 2006. http://agri.nv.gov/nwac/PLANT_NoxWeedList.htm.

APPENDIX E
Visual Contrast Rating Sheets for KOP #1, KOP #2, and KOP #3

Form 8400-4
(September 1985)

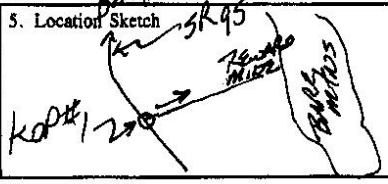
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 9-26-07
District LAS VEGAS
Resource Area
Activity (program) MINERAL

SECTION A. PROJECT INFORMATION

1. Project Name: REWARD MINE
2. Key Observation Point: KOP #1
3. VRM Class: VRM CLASS III
4. Location: Township 13S; Range 47E; Section 15
5. Location Sketch:



SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Alluvial fan - f.g. Rugged, angular mtns - b.g.	widely spaced shrubs - f.g. Mostly bare rock - b.g.	Road - f.g. bldg. - m.g. None - b.g.
LINE	Curve/linear to linear	None	Linear - road
COLOR	Desert tan, grey, + reddish brown	Grey-green	White - bldg. Grey - road
TEXTURE	Fine-grained - f.g. Coarse - b.g.	Coarse	N/A

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Same + benched earth pad + waste rock dumps	Same	Same + some water tanks
LINE	Same + more linear	Same	Same + tanks + bldgs in b.g.
COLOR	Same + unweathered rock	Same	Same
TEXTURE	Same	Same	N/A

SECTION D. CONTRAST RATING ☑ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			X				X				X	
Line			X				X				X	
Color		X					X				X	
Texture			X				X				X	

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: GARY BACK, GBE
Date: 9-26-07

f.g. = foreground m.g. = middleground b.g. = background

SECTION D. (Continued)

Comments from item 2.

BECAUSE MUCH of the BACKGROUND IS EXPOSED ROCK, the SHORT-TERM piling of WASTE ROCK + HEAP MATERIAL will NOT CONTRAST GREATLY IN COLOR. THE HEAP LEACH PAD will ADD A LINEAR ELEMENT, AS will the WASTE ROCK DUMP DUE to the BENCHES. But following RECLAMATION, these facilities should BLEND IN w/ SURROUNDING TERRAIN.

Additional Mitigating Measures (See item 3)

ONE VEGETATED, the MINE AREA will BLEND WITH SURROUNDING LANDSCAPE. No ADDITIONAL MITIGATION NECESSARY.

☆U.S. GOVERNMENT PRINTING OFFICE: 1993—461-988/37094

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 9-26-07
District LAS VEGAS
Resource Area
Activity (program) MINERAL

SECTION A. PROJECT INFORMATION

1. Project Name: REWARD ~~PROJ~~ MINE
2. Key Observation Point: KOP#2
3. VRM Class: VRM CLASS III
4. Location: Township 12S; Range 47E; Section 5
5. Location Sketch: SR95; KOP#2; REWARD PROJ.

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	DISSECTED ALLUVIAL FAN - f.g. RUGGED, ANGULAR MTNS - b.g.	WIDELY SPACED SHRUBS - f.g. MOSTLY BARE ROCK - b.g.	N/A
LINE	CURVE/LINEAR - f.g. CURVE/LINEAR TO LINEAR - b.g.	NONE	N/A
COLOR	DESERT TAN - f.g. GREY, TAN, REDDISH BR - b.g.	GREY-GREEN	N/A
TEXTURE	COARSE f.g. COARSE b.g.	COARSE	N/A

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	SAME + REGULAR SHAPE WASTE ROCK DUMP	SAME	~~[illegible]~~ WASTE ROCK DUMP
LINE	SAME + MORE LINEAR ASSOCIATED W/ WASTE ROCK	SAME + ~~[illegible]~~ ~~[illegible]~~	LINEAR ELEMENT TO WASTE ROCK DUMP
COLOR	SAME	SAME + REDDISH BROWN TO GREY WASTE ROCK	REDDISH BROWN TO GREY
TEXTURE	SAME	SAME	SMOOTH - FINE GRAINED

SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			X				X			X		
Line			X				X			X		
Color			X			X				X		
Texture			X				X			X		

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: GARY BACK, GBE
Date: 9-26-07

f.g. = FOREGROUND m.g. = MIDGROUND b.g. = BACKGROUND

SECTION D. (Continued)

Comments from item 2.

Only a small portion of the pit highwall & the North waste rock dump are visible from this KOP.

Contrast is limited to short-term as reclamation will reduce linear, color, form & texture contrasts.

Additional Mitigating Measures (See item 3)

No. Short term duration so no additional mitigation is needed.

☆U.S. GOVERNMENT PRINTING OFFICE: 1983—481-988/33056

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 9-26-07
District LAS VEGAS
Resource Area
Activity (program) MINERAL

SECTION A. PROJECT INFORMATION

1. Project Name: REWARD MINE
2. Key Observation Point: KOP #3
3. VRM Class: CLASS III
4. Location: Township 12S; Range 47E; Section 21
5. Location Sketch: GRID 29; GOLD ROAD MINE; KOP#3; CARRARA CANYON

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	ALLUVIAL FAN - f.g. RUGGED, ANGULAR MTNS. - b.g.	WIDELY SPACED - f.g. MOSTLY BARE - b.g.	DO BLDG. - m.g.
LINE	LINEAR - SLOPES & MTNS.	NONE	N/A
COLOR	DESERT TAN & REDDISH BROWN, GRAY	GREY-GREEN	WHITE BLDG.
TEXTURE	COARSE TO FINE GR.	COARSE	N/A

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	SAME + ANGULAR FORMS - HEAP & WASTE	SAME	SAME
LINE	SAME + MORE LINEAR	SAME	SAME + REGULAR FORMS
COLOR	SAME + MORE GREY & REDDISH BROWN	SAME	WASTE & HEAP - GREY + REDDISH BROWN
TEXTURE	SAME	SAME	SAME

SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS: Form		X					X			X		
Line		X					X			X		
Color		X					X			X		
Texture			X				X				X	

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: GARY BACK, GBE
Date: 9-26-07

f.g. = foreground m.g. = mid ground b.g. = background

SECTION D. (Continued)

Comments from item 2.

THE NEW STRUCTURES - HEAP, WASTE ROCK + PIT highwall ARE MUTED by the MOUNTAIN BACKDROP. RECLAMATION + WEATHERING of highwall will REDUCE CONTRASTS IN form, LINE, Color + TEXTURE over time.

Additional Mitigating Measures (See item 3)

NOT BEYOND RECLAMATION.

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