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Item 13

WOOD GULCH PROJECT

PLAN OF
OPERATIONS

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Filed with: USDA Forest Service
Humboldt National Forest
Mountain City Ranger District
Mountain City, Nevada 89831

Preface

Homestake Mining Company (Homestake) is proposing to develop and operate a small, short duration open pit mining project in northern Elko County, Nevada for the purpose of extracting precious metal resources. The area of interest is situated in the northern Independence Mountain Range approximately 60 air miles north-northwest of Elko, Nevada. The project site is at an approximate elevation of 7500 feet in the headwaters region of the Owyhee River portion of the Snake River Basin. The proposed mine and associated ancillary facilities are located on public domain lands under the management jurisdiction of the USDA Forest Service.

The Plan of Operations outlined in the following pages discusses in detail the various operational elements of the proposed project. The Plan is intended to provide the basis for project review by the Humboldt National Forest, as the responsible land management agency, and to fulfill the regulatory requirements of the 36CFR228 regulations pertaining to mineral extraction activities on National Forest System lands subject to the U.S. Mining Laws of 1872 (30 U.S.C. 22 et seq.). These regulations provide the framework for agency review and approval of mineral resource extraction activities and the basis to insure that adequate measures are taken, where feasible, to minimize adverse environmental impacts associated with such activities.

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1.0 Introduction

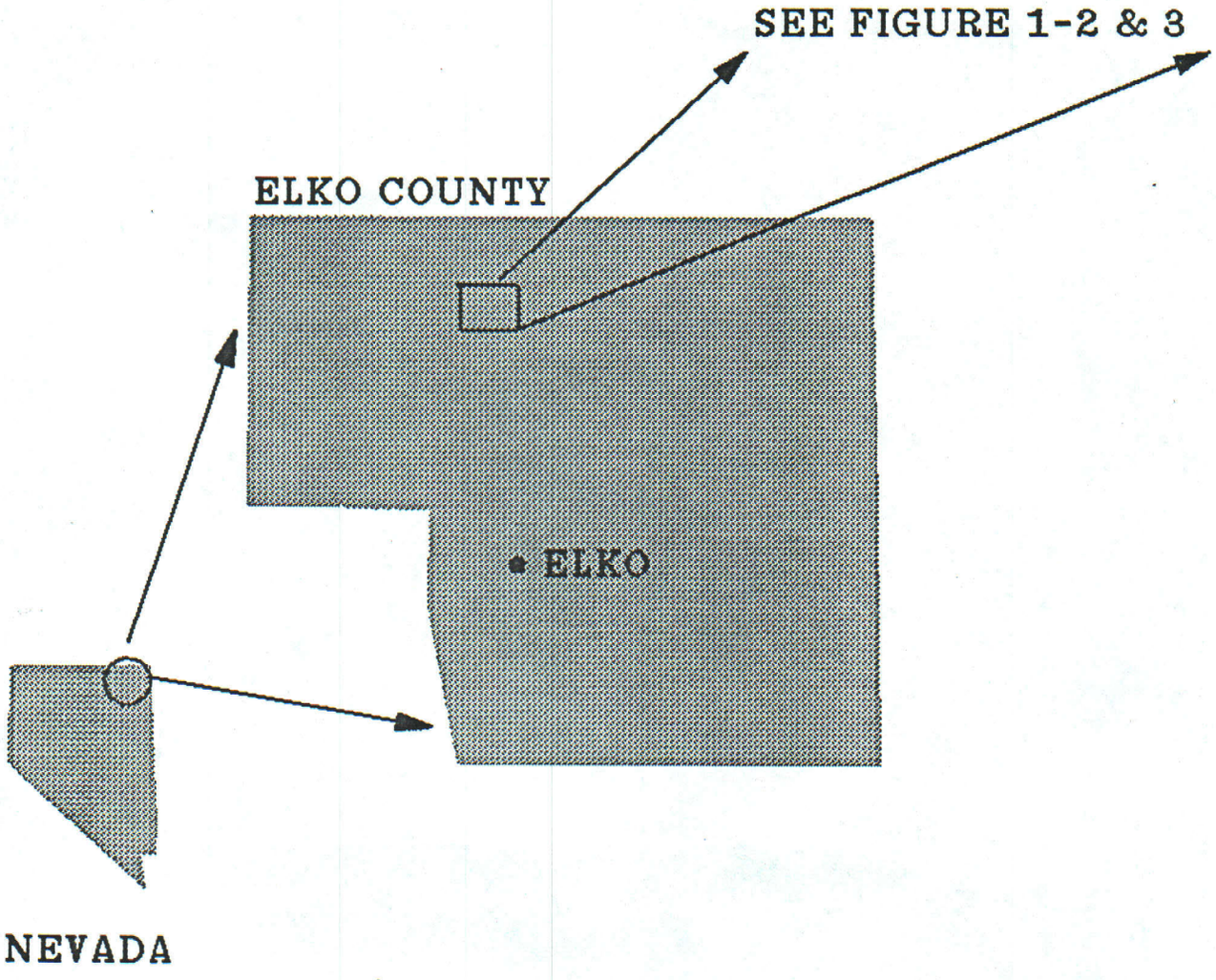
1.1 Background

Homestake Mining Company (Homestake) began a preliminary examination of mineral potential at the Wood Gulch property in late 1983. As a result of early geologic mapping and sampling, several areas were identified as having potential gold mineralization with further detailed evaluation being recommended. Homestake acquired a property position at Wood Gulch by staking a group of lode mining claims in the area and securing a mineral lease with another mining claim owner. Additionally, several groups of mining claims were secured in 1984 through the acquisition of Felmont Oil Corporation.

During the period of 1984-86, Homestake conducted several exploratory drilling programs at the property as well as developing a new exploration access road from the Trail Creek/Maggie Summit Road north of the property. These activities were reviewed and approved under annual Operating Plans filed with the Mountain City Ranger District office of the Humboldt National Forest. Exploration results to date have identified a small mineable reserve of gold/silver ore mineralization and plans are to conduct additional drilling in the ore body area to confirm continuity of mineralization and mineability. The Wood Gulch Project, as outlined in the following pages, is proposed to develop and extract the ore mineralization at the property should final metallurgical and mineability studies prove favorable.

1.2 Project Location and Access

The Wood Gulch Project is located in northern Elko County, Nevada (see Figure 1-1) in the northern portion of the Independence Mountain Range at an elevation of approximately 7500 feet. The property lies approximately 60 air miles north-northwest of the community of Elko, the county seat. Current access to the project is



Regional Location Map

HOMESTAKE MINING COMPANY

WOOD GULCH

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Fig. 1-1

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provided from Mountain City (the nearest community) and Elko by State Highway 225 and then by an unimproved dirt county road (Maggie Summit Road) which traverses the Independence Mountains in a southwesterly direction. Access to the project site from the Maggie Summit Road is provided by an exploration road (constructed by Homestake) following portions of the Trail Creek canyon and Wood Gulch drainages (see Figures 1-2 and 1-3).

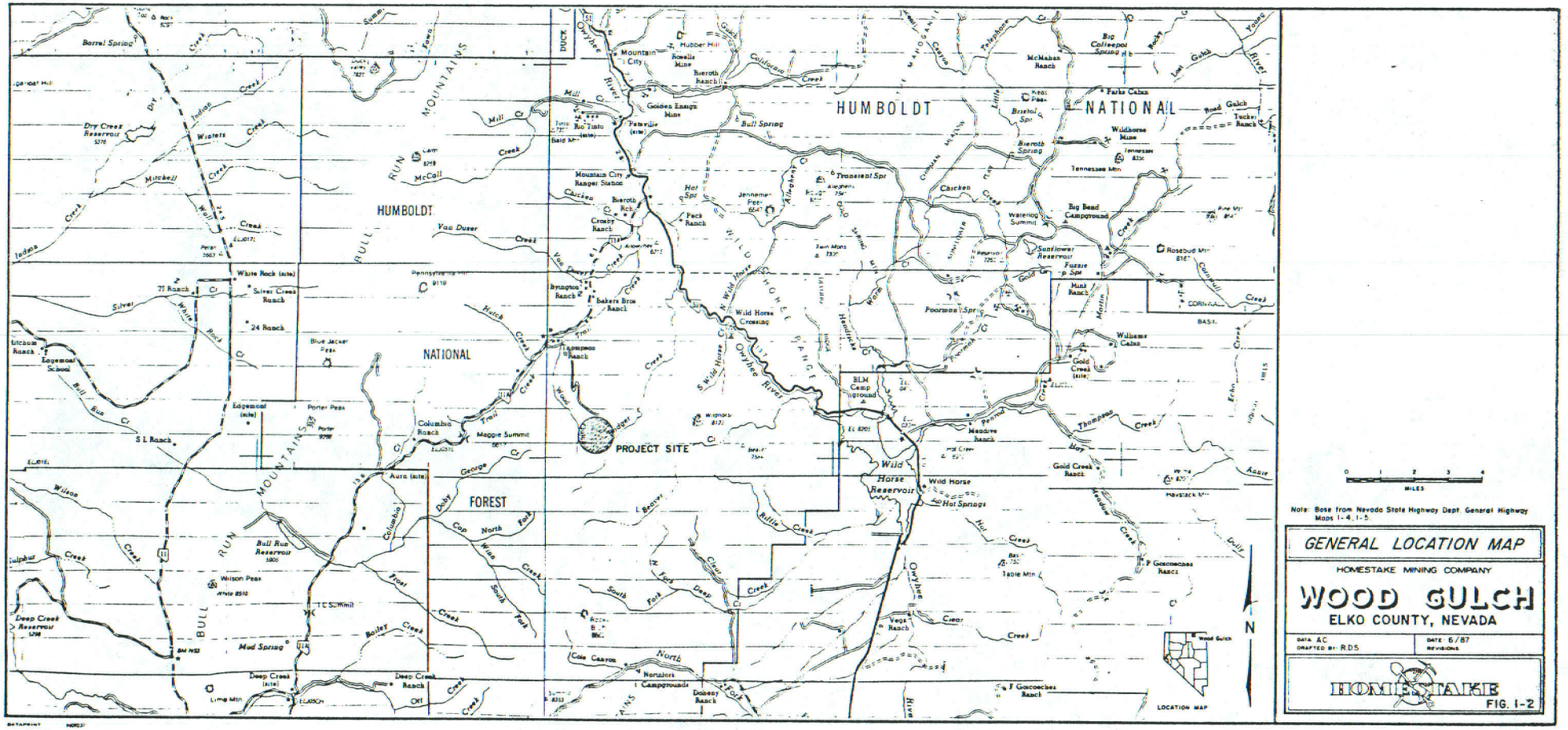
1.3 Land Status

The entire project is situated on National Forest System lands under the management jurisdiction of the Humboldt National Forest-Mountain City Ranger District. All activities will be situated on unpatented lode mining claims with the exception of a 5 acre right-of-way easement with a local landowner for the current project access road.

The Wood Gulch property encompasses a total of 395 unpatented lode mining claims situated within the boundaries of Sections 1, 2, 11, 12, 13-16, 21-24, 25-27, 35, 36, Township 44 North, Range 53 East; Sections 30 and 31, Township 44 North, Range 54 East; Sections 1-3, 11, and 12, Township 43 North, Range 53 East; and Sections 6 and 7, Township 43 North, Range 54 East, M.D.B. & M. These mining claims are held outright by Homestake or through lease agreement with other claim owner(s). A listing of the claim names and BLM serial numbers for the lode mining claims held or controlled by Homestake are found in Appendix A along with a land status map showing the mining claim blocks.

2.0 Project Description

The Wood Gulch Project will involve the construction, operation, and subsequent reclamation of an open pit mine, associated waste and ore haulage roads, waste dumps, heap leach pad, processing facilities, and ancillary support facilities necessary for extraction and processing gold/silver ore. Present identified ore reserves for the Wood Gulch orebody are currently estimated at 720,000 tons which are amenable to conventional heap leach extraction methods. Based upon present ore



Note: Base from Nevada State Highway Dept. General Highway Maps 1-4, 1-5.

GENERAL LOCATION MAP

HOMESTAKE MINING COMPANY

WOOD GULCH

ELKO COUNTY, NEVADA

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FIG. 1-2

Note: Base from U.S.G.S. 15' Bull Run, Wild Horse, Owyhee Mountain City topo quadrangles.

GENERAL LOCATION MAP - TOPO

HOMESTAKE MINING COMPANY

WOOD GULCH

ELKO COUNTY, NEVADA

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FIG. 1-3

inventory information, approximately 2.7 million tons of waste will be developed yielding an approximate 3.8:1 waste:ore ratio. Currently identified ore reserves indicate a 2 year project mine life; extractive leaching of ore for gold/silver production will commence soon after waste and ore production activities are initiated. Active cyanide leaching of ore materials is expected to occur typically from May through November of each operating year depending upon operating requirements and weather conditions. Gold production rates will vary depending upon the stage of the leach cycle; peak production will likely occur in Year 2 of the project.

Surface disturbance impacts associated with the planned operation will involve a total of approximately 88 acres, with a breakdown by project component as follows:

Table 1-1

Estimated Surface Disturbance

Area	Acreage
Mine Pit	12
Waste and ore haulage roads	15
Waste dumps	24
Leach pad	18
Processing facilities	5
Maintenance/offices	2
Ancillary facilities/secondary support roads	12
Total Disturbed Acres	88

Work force employment projections for the project will vary from a peak employment level during development and construction to a low during gold leaching and production activities near the end of the project life. Mining activities will be done on a contract mining basis. The estimated work force levels during the project will be 35-45 people during the construction and contract mining phase and 10-15 people during the final leaching and gold production phase after pit completion. Local hiring will be practiced when feasible during the construction and operational phases of the project.

2.1 Proposed Mining Operation

The Wood Gulch Project currently contains mineable reserves of 720,000 tons in a single ore body situated near the boundary of Sections 25 and 26, T44N, R53E, at a surface elevation of approximately 7500 feet.

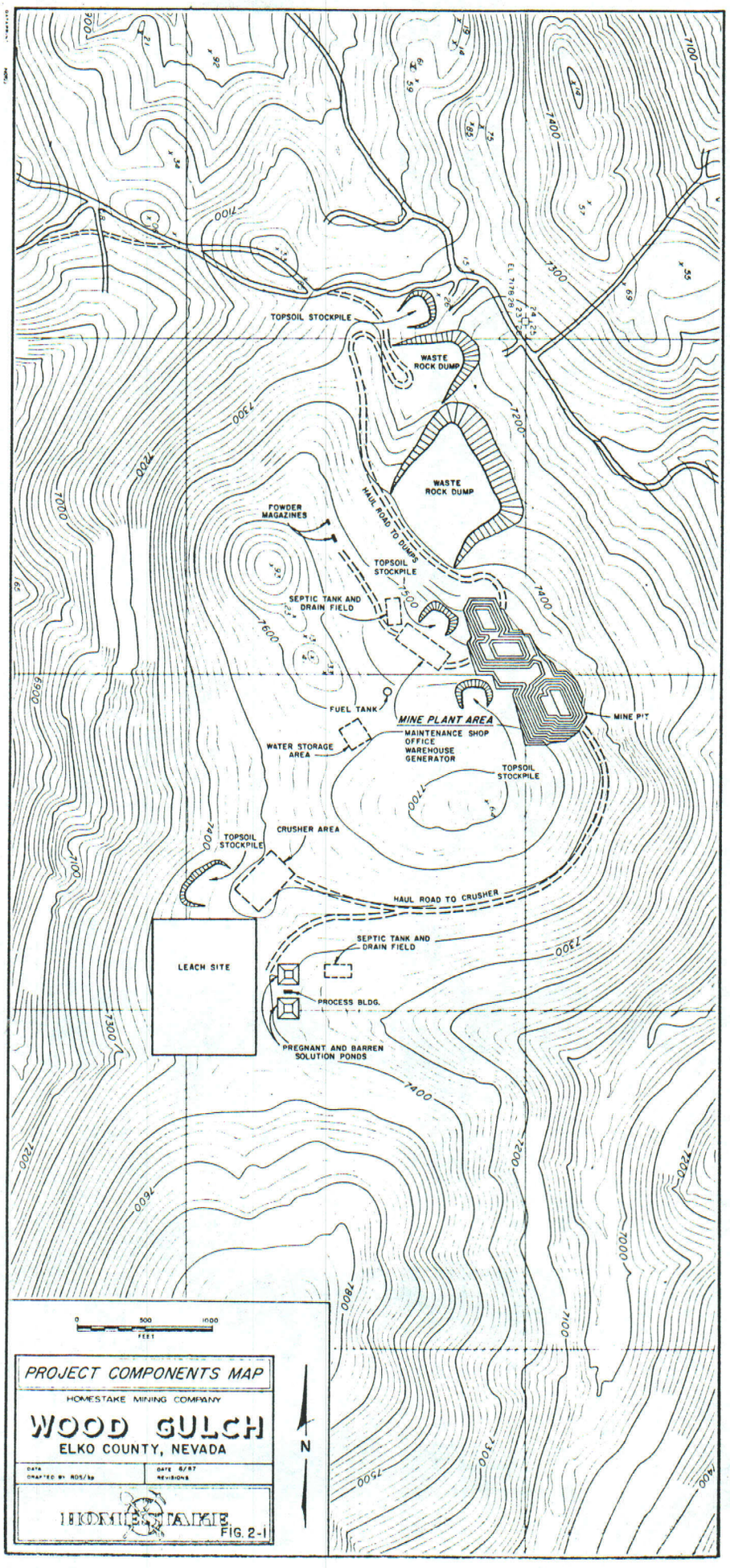
Mineralization occurs in a structurally prepared sequence of sedimentary rocks that have been intruded by sills and dikes of dacitic/andesitic composition. Gold values are generally erratic and occur with quartz, pyrite and iron oxides in stockworks of veins and veinlets and as disseminations in silica flooded zones.

Oxidation depths are commonly below 200 feet of the surface but are quite variable throughout the property. Micro scale argillic alteration is prominent within the mineralized areas.

The Wood Gulch Project ore body will be developed as an open pit mine using conventional hard rock mining methods. As mentioned previously, the pit area will occupy an area of approximately 12 acres. Mining will use front end loaders and trucks for loading and hauling ore and waste material. Mining of the ore body will be accomplished during the first 1 1/2 years of operation and will involve removal of approximately 3.4 million tons of rock material (.7 million tons ore, 2.7 million tons waste), based upon present calculated mineable ore reserves. Ore materials will be crushed, agglomerated and hauled to a dump leach pad in close proximity to the pit area. Waste materials will also be hauled and disposed of in nearby waste dump locations. Figure 2-1 shows the proposed locations of various components of the mining and processing operations.

2.1.1 Mine Pit

The size and configuration of the proposed pit (see Figure 2-1) was developed based upon mineral deposition characteristics and projected economic limits based upon ore grades, stripping ratio, and anticipated precious metals prices. At the present time, the pit is designed to have 1:1 pit wall slopes with mineable limits determined using 20 foot bench projections. Present pit design calculations indicate that the ultimate pit



PROJECT COMPONENTS MAP

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WOOD GULCH

ELKO COUNTY, NEVADA

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FIG. 2-1

will be approximately 1300 feet long, average 500 feet in width and 200 feet deep at its greatest depth. The maximum projected slope height at the deepest point would be approximately 460 feet.

Pit wall stability and geotechnical considerations may require modification of current pit wall slopes estimates; further engineering and geotechnical evaluation is planned in the near future and, as necessary, pit designs will be modified to insure stability. Additionally, stability of pit slopes will be monitored during mining operations and modifications implemented as necessary to assure adequate stability.

2.1.2 Mining Sequence

Prior to pit construction, the planned pit area will be brushed in areas with larger vegetation and available topsoil prestripped and stockpiled. Topsoil stripping activities may be completed in several stages as the open pit development progresses during mining. Mining activities will consist of conventional open pit mining techniques involving drilling, blasting, loading, and hauling of ore and waste rock materials. Ore material will be loaded into trucks using a front-end loader and hauled to the crushing facility; waste rock will be loaded and hauled to waste rock disposal areas in a similar fashion.

Mining activities are currently planned for completion within the first 1 1/2 years of project operation. Contract mining will be utilized and it is anticipated that mining activities will occur on a two shift basis, 8-10 hours per shift, operating 6 days per week. Due to climatic conditions in the project region, mining operations could be intermittently suspended during the winter months.

2.1.3 Blasting Procedures

Ore body rock characteristics at the Wood Gulch Project will dictate that most, if not all, rock materials will require drilling and blasting prior to removal from the pit.

Blasting activities involved with mining operations will be accomplished during daylight hours. Customary blasting practices utilized in the mining industry will be followed and will conform to federal safety requirements pertaining to the storage, handling and use of explosives.

Blast hole drilling would be accomplished using either a rotary or hammer (percussion) blasthole drill(s). Blasthole spacing will be designed to maximize fragmentation and fracturing; this will aid in loading and hauling ore and waste materials as well as reducing or minimizing crushing requirements prior to adding ore to the heap pad for leaching.

ANFO (ammonium nitrate-fuel oil mix) will be used as the primary blasting agent. Charge size will vary depending on location in the pit and ground conditions; it is expected that charge loading, however, will not exceed 1000 pounds per cap delay. Blasting will normally occur once a day during mining activities; on infrequent occasions, however, more than one blast could be shot depending on production requirements. Explosives materials will be brought on site by truck and stored in approved storage facilities. Ground acceleration and air blast levels will be controlled using scaled distance formulas generally accepted in the industry and recommended by explosives manufacturer specifications. Although no problems are anticipated due to blasting, monitoring equipment will be used and mitigation procedures implemented should unexpected problems occur. The closest occupied residence is approximately 3 air miles from the mine site.

2.1.4 Haul Roads

Major haulage routes for transport of ore and waste materials from the pit area are shown on Figure 2-1. Haul roads will be designed for use by off-highway rock trucks and of sufficient width to provide safe transport of materials to the processing and leach facilities and waste rock dumps. Current

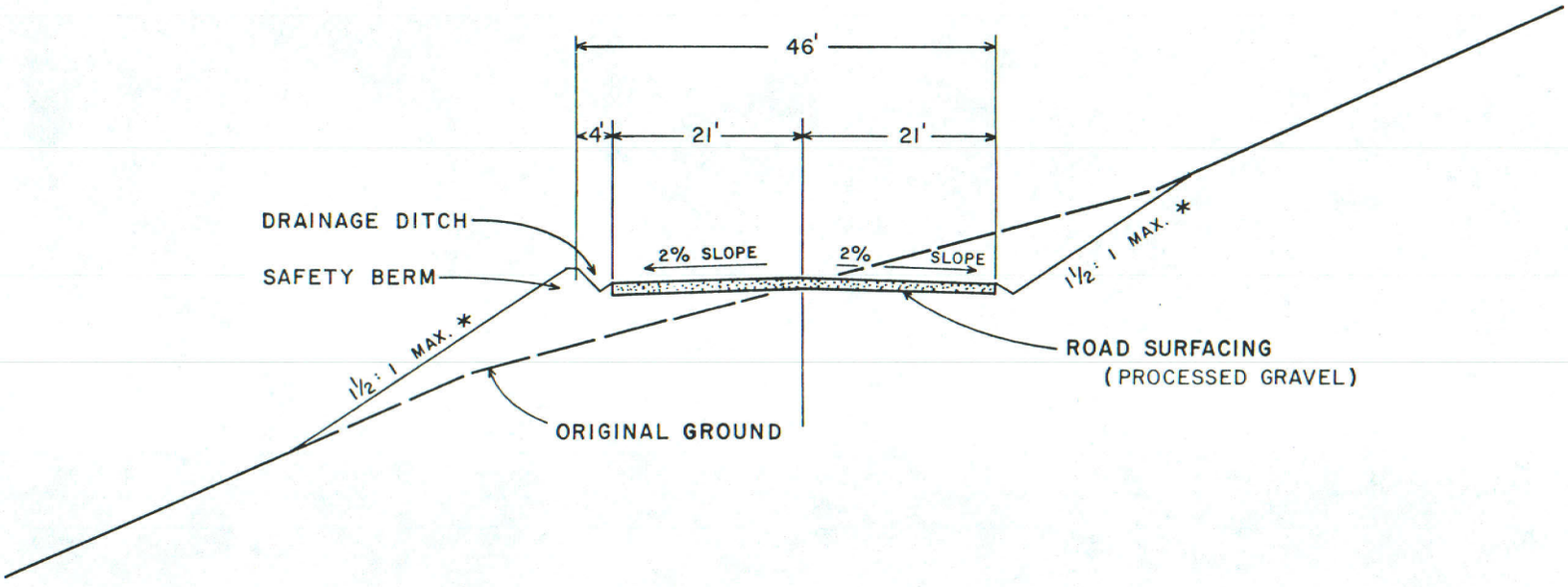
haul road design includes a 42 foot wide road surface with allowance for drainage ditching on both sides; in the case of cut/fill road sections, safety berms will be constructed on the fill side with periodic cutouts to handle drainage requirements. The road surface will be crowned at approximately 2% to provide for drainage and surfaced with processed gravel or other suitable wearing surface materials. Cut and fill slopes will not exceed a 1 1/2:1 unless competent rock materials are encountered that will support a steeper slope gradient. A typical haul road cross section is shown in Figure 2-2.

Haul road maintenance will include use of a motor grader to maintain roadbed surfaces and erosion and drainage control structures (ditching, cutouts, berms, etc.).

Approximately 1.4 miles of ore and waste haulage roads will be required for the life of the mine having an estimated total surface disturbance area of 15 acres.

2.1.5 Waste Dumps

Waste dump development will be located north of the open pit boundary (see Figure 2-1). Depending on waste characteristics, some material could be used for road base along proposed haulage routes to the waste dump locations and the ore crushing and heap leach pad area. Given the estimated waste:ore stripping ratio of 4.3:1, a total of approximately 3.1 million tons of waste will ultimately be placed in the two waste dump locations. Additional dump area capacity over conceptual design will be available should additional waste development be required due to changes in the size of ore reserves amenable to economic mining from the pit or as might be required to accommodate adequate pit wall stability.



* STEEPER IF COMPETENT ROCK IS ENCOUNTERED

20' 0' 20'

FEET

TYPICAL HAUL ROAD CROSS SECTION

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WOOD GULCH PROJECT

ELKO COUNTY, NEVADA

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FIGURE 2-2

The waste dumps will be developed by end dumping with the active dump face lying at the angle of repose. Assumptions used in the conceptual design of the waste dumps were: 1) the angle of natural repose for the waste rock will be 38 degrees; 2) a swell factor of 30% (in situ to waste dump). Waste rock materials from the pit are primarily composed of shales, siltstones, and sandstones exhibiting weak to moderate silicification and local argillic alteration.

Waste material segregation during end dumping would result in coarser waste material occupying the lower portions of the dump along the dump foundation. In this manner, natural voids will be largest along the lowermost sections of the dump during waste development and will enhance drainage characteristics. Waste rock and dump foundation characteristics will be investigated in further detail prior to commencement of actual waste dumping activities; if required, the conceptual design and/or dump configuration may be modified. Preliminary site investigation reveals that significant springs are not located in the area of the proposed waste dumps.

As a supplement to information obtained from previous exploration drilling in the vicinity, additional condemnation drilling will be conducted to insure that potential mineral resources are not situated within the planned waste dump areas.

2.1.6 Mining Equipment Requirements

The following list of mining equipment is foreseen for use at the Wood Gulch Project during mining and processing activities. It should be noted that the list is tentative and specific equipment could vary somewhat due to actual equipment supplied by the contract mining group selected for the project.

Table 2-1

Major Mining Equipment List

Quantity	Equipment	Anticipated Size
3	front end loader	± 5 YD^3
1	blasthole drill - air or percussion	6 1/2 inch
6	haul trucks	± 35 ton class
2	track mounted dozers	D8-9 class
1	motor grader	14-16G class
1	water truck	3000-5000 gallon
1	backhoe	± 1 YD^3
1	portable ore crusher	200-300 TPH
1	service truck	2 ton
1	blasting truck	1 ton
2	diesel electric generators	100-400 KW
1	vibratory roller/compactor	

2.1.7 Mine Site/Ancillary Facilities

Mine site service facilities for the project will consist of a truck/equipment ready line, maintenance trailer, tool trailer, explosives magazines, mine office trailer, above ground fuel storage tank(s), lube oil storage trailer, and a supply warehouse and storage yard for lay down of mine supplies. Electrical power will be supplied by a diesel electric generator with electrical supply lines distributed as needed in various areas of the mine and processing facilities. The ore crushing facility will likely have a separate diesel powered electric generation source. Most of the structures for the project will be portable (i.e., trailers). These facilities will be located at the mine site as shown in Figure 2-1.

2.1.7.1 Fuel/Lubricant Storage

Fuel for the diesel powered equipment and power generator will be stored in above ground tanks. These tanks will be installed on prepared foundations and bermed to contain any potential spillage or leaks. Containment

berms will be designed to contain the entire contents of tank storage in the event of tank rupture. Lubricant/oil storage will also provide for adequate storage and proper containment of any spillage or leaks should they occur.

2.1.7.2 Explosives Storage

The explosives magazine storage will be located away from the active mine and plant areas (see Figure 2-1) and will be designed to meet applicable MSHA and BATF safety requirements and specifications.

2.1.7.3 Employee Parking

Sufficient mine personnel and employee parking will be supplied at the mine plant and processing facility areas. Employee car pooling will be practiced to reduce the number of vehicles at the mine site thereby reducing parking space requirements.

2.1.7.4 Sanitary/Solid Waste Disposal

Sanitary waste disposal will be provided at the mine office/plant area and the processing/recovery facility utilizing a septic tank system with leach drain fields. The location of both septic systems is shown in Figure 2-1. Each facility will be properly designed and constructed to meet specific site conditions and applicable state and county permitting requirements for sanitary waste disposal. Solid waste (refuse) disposal will be provided near the mine site and will be permitted and approved in accordance with applicable federal, state and local regulatory requirements.

2.1.7.5 Drinking Water Supply

Potable water supplies for consumptive use at the project will be provided from wells or commercial sources and transported to the mine site for employee use.

2.1.7.6 Operation Water Supply

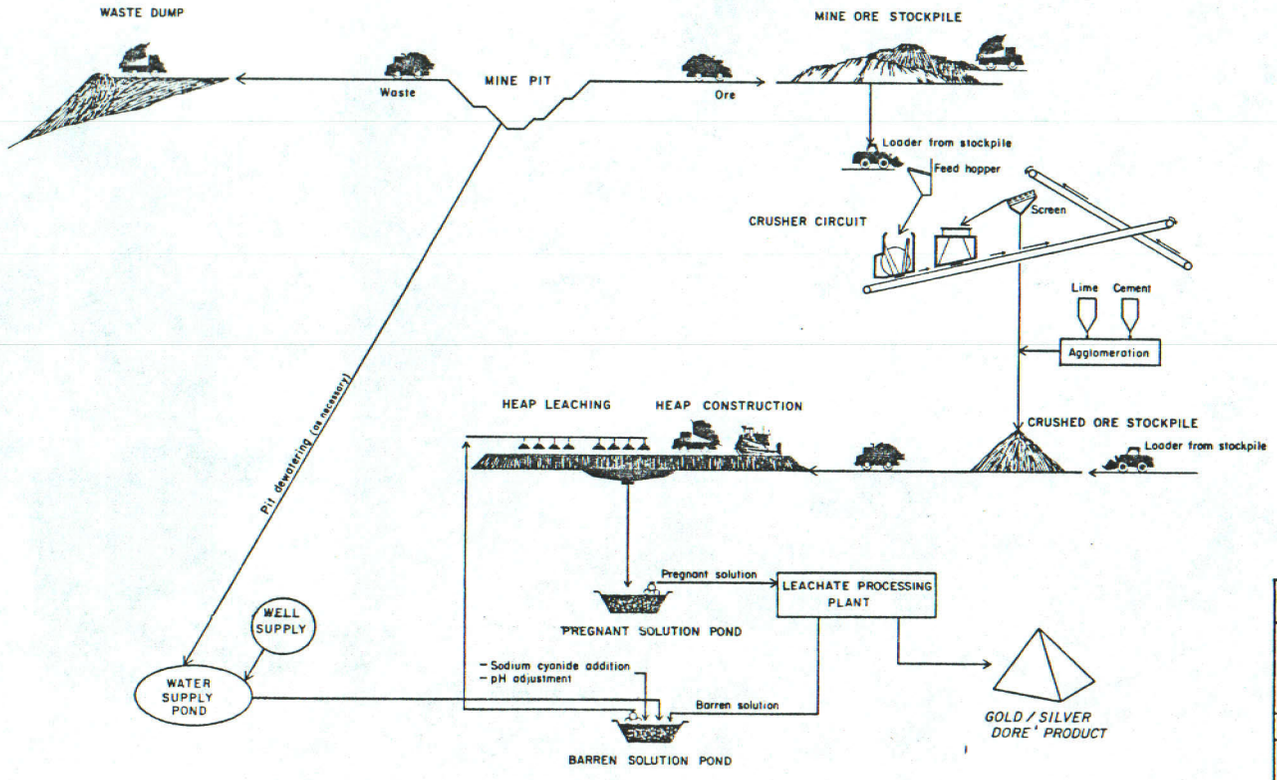
Water supply requirements for the heap leach facility, road maintenance, and mining activities will be provided primarily by a production well or wells located in the vicinity of the project site. Although little water is anticipated in the mine pit, any water encountered during mining activities will also be utilized to meet operational needs. Anticipated maximum water needs are 500 gpm on a seasonal basis with peak demand occurring in the summer months during active heap leaching operations. Water will be pumped to a water storage pond located as shown on Figure 2-1. Pit dewatering and pumping from production well(s) will be to this pond for storage. This pond will have a maximum storage capacity of less than 10 acre-ft. and will be engineered to sufficiently minimize water losses due to evaporation and/or seepage. A pump station will deliver water through a pipe-line for use as makeup water at the process/recovery facility or, alternatively, gravity flow may be utilized. Water needed at the mine site or for road maintenance will be pumped or gravity fed to places of use or directly loaded into a water truck (haul road watering).

2.2 Ore and Heap Leach Processing Facilities

The proposed heap leach pad and recovery facility will be located approximately 2200 feet southwest of the open pit mine area (Figure 2-1). The leach pad, process solution ponds, processing plant, and crushing facility areas will occupy an area of approximately 25 acres. A flowsheet diagram of the general ore processing/gold recovery process is shown in Figure 2-3.

The areas proposed for siting of the heap leach pad and recovery facilities will be investigated for geologic information to document mineral potential underlying the area. Condemnation drilling activities are planned as part of the geotechnical and site engineering activities associated with design of the processing facility components.

ORE PROCESSING FLOWSHEET



ORE PROCESSING FLOWSHEET

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WOOD GULCH PROJECT

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FIGURE 2-3

2.2.1 Ore Stockpiling

Run of mine ore materials will be stockpiled in the crusher area for staging through the ore crushing plant. Ore will be fed through the plant by direct dumping from haul trucks arriving from the pit, or, alternatively, by front end loader if ore stockpile materials are being drawn from. Stockpiled ore will be placed on a properly designed and constructed pad to prevent off-site runoff during precipitation events. The conceptual design capacity for the ore surge stockpile is approximately 15,000 tons.

2.2.2 Ore Crushing

The ore crushing facility will be located northeast of the leach pad area (Figure 2-1). Run of mine ore will be crushed to size through use of jaw and/or cone crushing units. Material size will be controlled using deck screening with the oversize product reporting back to the crushing circuit. A conveyor system will be utilized to transport materials through the crushing process.

Ongoing metallurgical studies will determine the optimum size of crush for the project ore materials to optimize metal recovery and leach time. Ore agglomeration (addition of cement or lime) prior to placing material on the leach pad will be necessary to enhance ore heap percolation efficiency. This will be accomplished after ore crushing is completed.

2.2.3 Heap Leaching Facilities

Crushed ore materials will be stockpiled for subsequent loading on haul trucks for transport to the heap leach pad. After truck end-dumping of the crushed ore on the pad, a dozer will be utilized for final placement of material to reduce compaction and insure adequate percolation of applied leach solutions.

2.2.3.1 Leach Pad

The proposed heap leach pad will be designed for permanent ore placement, leaching and subsequent neutralization upon abandonment at the end of the project. As such, spent ore will be left in place on the pad and reclaimed on-site. The design for the leach pad and associated liner system will meet the requirements of the Nevada Division of Environmental Protection (NVDEP). Design criteria will be based upon insuring stability of the heap materials and prevention of leach solution leakage. All leaching and processing solution systems will be designed for zero discharge conditions as an environmental protection measure and to avoid loss of valuable leachate solutions. Geotechnical and engineering site investigations will be completed for the proposed leach pad area such that specific base preparation and compaction measures can be specified for pad construction as well as determination of the pad liner or membrane(s) materials required.

The current conceptual design for the leach pad includes an area 800 x 1000 feet; this will accommodate the currently identified mineable ore reserves with sufficient excess capacity in the event that additional ore reserves are identified in the pit area during mining operations. During pad construction, the base foundation will be prepared to allow natural flow of percolated leach solutions to lined perimeter ditching and piping systems for collection and transport of leachate to the pregnant solution pond. Drainage piping may be installed on top of the pad liner system and under the heaped ore materials to enhance uniform drainage of the heap and to minimize any hydraulic head on the pad liner.

2.2.3.2 Pregnant/Barren Solution Ponds

The pregnant and barren solution ponds are situated immediately to the east and down gradient from the heap leach pad (see Figure 2-1). Leachate solutions from the leach pad will be directed to the pregnant solution pond. This pond will be designed to contain all solution flow from the leach pad as well as capacity for containment of the maximum design storm event and calculated snowmelt volumes following the winter period. The solution pond will be constructed over compacted earth with a liner and leak detection monitoring system designed and engineered to meet site conditions and permit requirements specified by NVDEP.

The barren solution pond is used to contain leach solutions after processing through the recovery system. This pond will be designed to similar specifications for the pregnant solution pond and will include a liner and leak detection system as required by state permit requirements.

2.2.3.3 Leach Circuit Description

Leach solutions for application on the ore heap will be prepared at the barren solution pond. Makeup water and chemicals will be added at this point to adjust the chemical balance of the solution prior to pumping and application on the ore heap. Sodium cyanide and lime or caustic will be added as necessary to maintain proper cyanide and pH levels. Ongoing metallurgical studies will determine the appropriate cyanide levels and application rates to be used to maximize extraction and recovery efficiencies in the process system. Solution alkalinity will be maintained at an approximate 10 to 11 pH. NaCN concentration may be in the range of .5 grams/liter of solution.

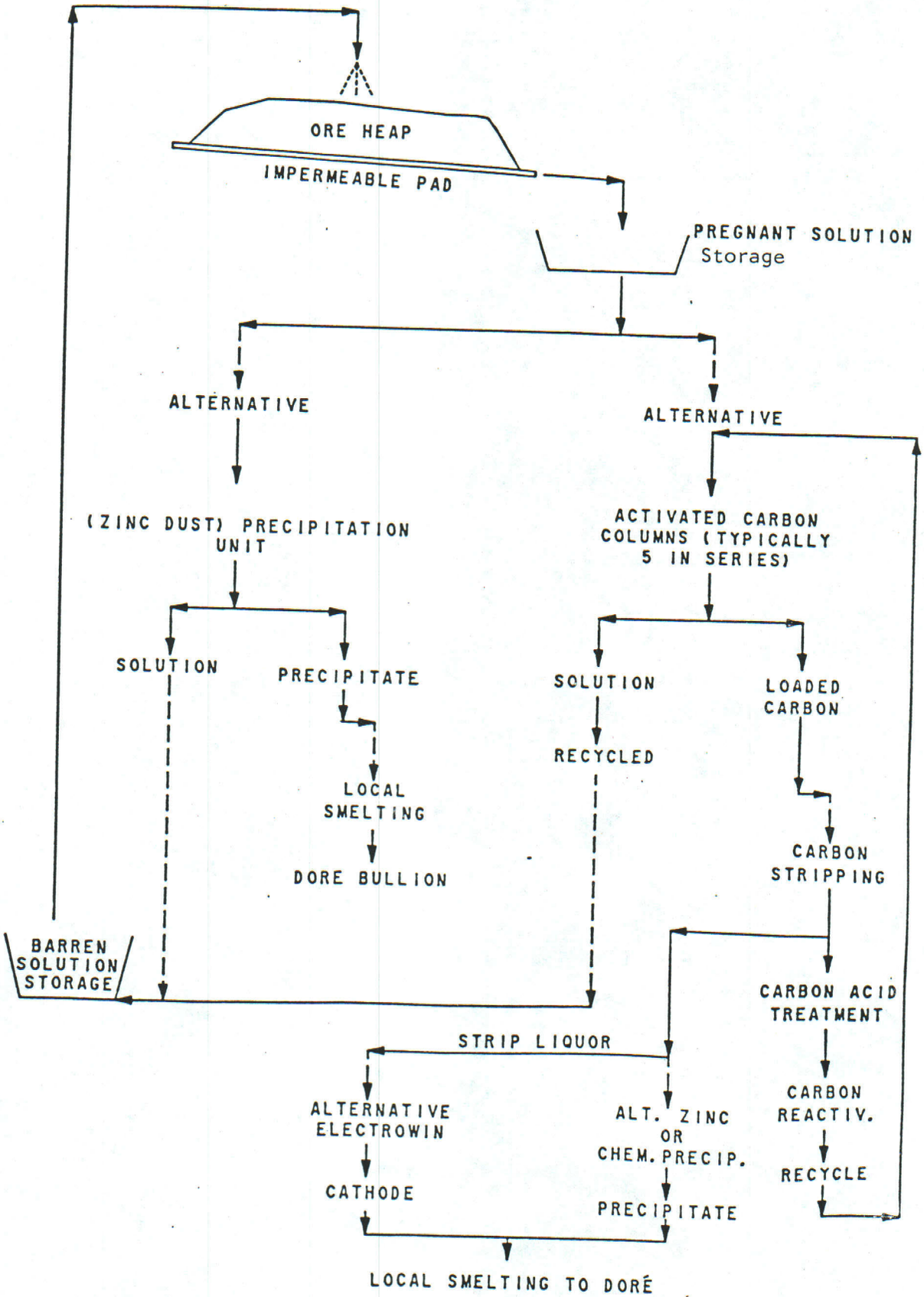
After sprinkle application of the prepared leach solution on the ore heap pad, drainage from the heap will be collected in pipes and lined ditches for gravity flow to the lined pregnant solution pond. Pregnant leachate will then report to the gold/silver recovery process, stripped of metal values, and the stripped solution returned to the lined barren solution pond where the chemical balance is adjusted as necessary prior to reapplication on the ore heap.

2.2.3.4 Processing/Recovery Facility

The precious metals recovery facility will be located in close proximity to the pregnant and barren solution ponds as shown in Figure 2-1. Recovery equipment utilized to remove gold and silver values from the pregnant leachate solution will be housed in a metal building on a concrete pad foundation. The concrete pad will be bermed around the outside perimeter and sloped to drain via piping into the solution ponds in the event of spillage or leakage of solutions in the recovery process. This design will insure that the process is fully contained and under a zero discharge system as with other aspects of the heap leach cycle.

Pregnant leach solution will be pumped from the pregnant pond into the recovery circuit for precious metal extraction and then pumped to the barren pond. Two alternative recovery processes are under consideration; upon completion of current metallurgical studies, one of the alternatives will be chosen. The two alternative processes are shown on the circuit flowsheet in Figure 2-4 and described below:

A) The carbon absorption recovery method involves the use of several carbon columns connected in series with the gold bearing cyanide solution



WOOD GULCH PROJECT
Metal Recovery Circuit
Figure 2-4

being pumped upward through the column. The carbon will be loaded to approximately 200-300 ounces of gold per column prior to carbon removal and stripping. Recovery of gold from the loaded carbon will be accomplished through a hot caustic stripping unit. The process employs a weak sodium hydroxide-sodium cyanide strip solution which is heated to an approximate 80-90°C temperature. This solution desorbs the gold from the carbon back into solution. The loaded strip solution will then be passed through an electrowinning cell(s) or, alternatively, through a zinc or chemical precipitation/filtration system. The electrowinning method (Zadra process) results in gold being precipitated on steel wool cathodes. The loaded steel wool would then be transferred to a crucible furnace, smelted with appropriate fluxes, resulting in doré bullion. The zinc or chemical precipitation method involves treating the loaded stripping solution with zinc dust or chemically precipitated to produce a filterable product. Loaded filters are then sent to the crucible furnace yielding precious metal doré.

B) The zinc dust precipitation recovery method involves processing the pregnant solution through a clarification filter system, deaeration unit, addition of zinc dust to the solution by a feeder system and subsequent pumping through a set of pressure filtration presses. The filters, which are loaded with gold-silver-zinc precipitate are then sent to a crucible furnace, smelted with fluxing agents and poured to produce a doré product. After zinc precipitation and pressure

filtration, the leach solution is barren and is sent to the barren pond for recycle to the leach pad.

In addition to the metal recovery circuit, the processing building will also house assay laboratory facilities for atomic absorption (AA) and fire assaying of mine ore for grade control and testing metal values of solutions involved with leaching and recovery operations.

2.2.4 Chemical Handling

Chemicals and reagents for use in the heap leaching operation are listed below in Table 2-2. This list could change somewhat due to a final decision on the recovery process alternatives discussed above, however, most major chemicals to be used are listed. Cyanide will be trucked into the processing facility area and will come in metal flo-bins (recyclable), drums or dry bulk tanks. Lime and/or cement will be in bagged form and also brought in by truck.

Table 2-2

Chemical Reagents/Products List for Ore Processing

Sodium cyanide (NaCN)	Hydrochloric acid (HCl)
Sodium hydroxide (caustic soda - NaOH)	Nitric acid (HNO_3)
Activated charcoal	Cement
Various fluxes (fire assaying and doré production)	Fuel oil
Propane	Lime
Ethylene glycol	

2.3 Pollution Control Plans

Mining and gold recovery operations at the proposed project site will be carried out to minimize impacts upon environmental resources in the project area and surrounding region. Impact mitigation measures, where prudent and feasible, will be incorporated into the design and operational aspects of the operation. A number of

pollution control provisions will be necessary and required in association with various other operating permits and agency approvals, particularly with the Nevada Division of environmental Protection (NVDEP) and other state and local agencies. A partial listing of other permits and approvals required in addition to this Plan is included in Appendix B.

The major pollution control considerations applicable to the project are addressed by topic area in the following sections.

2.3.1 Fugitive Dust/Particulate Emissions

Roads within the mining and processing areas will be watered as necessary to control fugitive dust emissions. Entrainment of fugitive dust due to windy conditions may also require periodic watering of exposed surface disturbance areas within the project site. Dust emissions from the ore crushing facility will be controlled at key material transfer points with water spray bars and, if ore agglomeration is required, water will be injected with the ore during cement addition. Specific control measures will be determined in consultation with NVDEP-Air Quality Control Section personnel and the Forest Service.

2.3.2 Drainage/Sediment Runoff Control

Most of the proposed project site is situated near or at the head of drainages tributary to the Badger Creek watershed and no major erosion and sediment control problems are anticipated. Several measures, however, will be implemented to control runoff and minimize erosional sediment loading downstream from the project area. Control measures for several project components are discussed below.

2.3.2.1 Mine Pit

The proposed pit is situated near the top of a hill (see Figure 2-1) and it is expected that little runoff will accumulate above the pit wall perimeter. Berming and ditching, however, will be installed above the pit as

necessary to prevent excess water accumulation in the pit. These structures, if needed, would be engineered to safely handle anticipated flows and will divert drainage around the pit area and discharge at locations where erosion potential is minimized.

Accumulation of water in the pit due to precipitation and groundwater inflow is expected to be small. As necessary, the pit will be dewatered by pumping to the water supply pond or used for haul road watering activities to control fugitive dust.

2.3.2.2 Waste Dumps

Diversion ditches for runoff flows and drainage courses affected by waste dump placement will be engineered and designed for location on the upstream side of the waste dumps. Runoff flows from the diversions will be directed to natural drainage courses adjacent to the dump or to a location where erosion potential is minimized.

A properly engineered sediment control dam or a series of temporary sediment traps or check dams will be located downstream of the dump area as necessary to control sediment from the dump and pit areas before reaching the Badger Creek drainage.

2.3.2.3 Leach Pad/Processing Facility

Upslope runoff will be channeled and directed around the leach pad and recovery/processing facilities areas. The leach pad will be bermed around the perimeter; due to the location of the pad (in a topographic saddle between watersheds), surface water runoff in the area will be minor and easily diverted from the pad area. The solution ponds and recovery facility will be at a higher elevation than the surrounding ground and drainage channels will divert any runoff from entering the ponds or facility site area.

2.3.2.4 Haul Roads

Design engineering for the ore and waste haul roads will take into consideration drainage and erosion control measures necessary to channel and control runoff flows. Roadway gradients will be planned to minimize erosion, the road surface crowned for drainage, and ditching provided along cut slopes (see Figure 2-2; Typical Haul Road Cross Section). Periodic drain cutouts will be provided along fill slope safety berms to channel drainage off road surfaces. As necessary, fill slopes at drains will be rip-rapped if the potential for bank erosion is apparent. Properly sized and engineered culverts will be placed along all drainage courses at road crossing locations.

2.3.3 Snow Removal

Snow management will be required during active mining operations and during a short period in the early spring and early winter months during heap leaching activities. Mining operations may be suspended temporarily during the severe winter months; leaching activities will only be possible when freezing conditions allow uninterrupted operation of the leach solution system.

Snow accumulations in the active pit area will be deposited in an inactive portion of the pit or, alternatively, at designated and approved snow stockpile locations.

Stockpile locations at all facility areas will be located where the additional snowmelt will not increase runoff onto roads or other project facilities.

Snow removed from the waste dump areas will be deposited in locations where dump stability and safety can be insured. Snow will not be dumped over the active dump face area to avoid potential dump stability problems.

Haul road snow removal will take place along the outside (downhill) portion of the road whenever possible, or bermed at the edge of the road surface during extreme snow accumulation

conditions. Snow berms will allow for sufficient drainage of runoff and periodic cutouts created as necessary. Culvert crossings will be kept clear of piled snow accumulations to assure proper culvert drainage under the roadway.

Snow at the mine office, ore crushing, and process building areas will be removed and placed around the perimeter of the facility area or stockpiled at designated locations.

2.3.4 Spill Prevention

A comprehensive plan for prevention and containment of spills for chemicals and petroleum products used at the project operation will be developed and will conform to state requirements arising from permit approvals and USEPA guidelines for a Spill Prevention Control and Containment Plan (SPCC Plan). Storage, handling and use of chemicals in the recovery facility area will be in areas such that any potential spills can be easily contained on site and within the leach processing system. Petroleum and lubricant products used at the mine and maintenance areas will be properly stored to contain any potential spills; fuel tanks will be placed on prepared pads and bermed to contain the volume of the largest tank in the event of a tank leak or rupture. Used oil products will be properly stored and periodically picked up for recycling.

3.0 General Project Reclamation Considerations

General reclamation guidelines and procedures are discussed below as they pertain to project construction and mine development activities, interim reclamation during the project life, and criteria for final reclamation of the open pit, waste dumps, haul roads, mine support and processing facility locations, and the leach pad and pond areas. A detailed reclamation plan will be developed in conjunction with completion of site specific field studies necessary to inventory and evaluate existing environmental resources and capabilities in the project area. The detailed plan will include consideration of the following major factors:

- Mass stability of various project components
- erosion potential of affected areas after mining
- land uses - current and post-mining objectives
- existing vegetation resources
- soils resources - types, quantity, reclamation suitability/capability
- revegetation capabilities including recommendations for seed mixtures, application rates and procedures, and post monitoring requirements.

3.1 Slash Clearing and Topsoil Prestripping

Prior to the start of construction activities in the various areas of planned surface disturbance, vegetative materials will be slashed as necessary and piled or stacked in appropriate locations adjacent to the area to be affected. Larger materials will be bucked up to improve ground contact and provide microhabitat for small rodents and mammals in the area. Most project components are situated in areas of low cover (sagebrush, low shrubs), however, isolated stands of larger trees are found in the project area. Some tree removal may be required near the pit area but will be minimal in extent. Trees of salvage value (fuelwood) will be felled, cut up, and stacked in nearby areas. Disposal of fuelwood will be decided upon in consultation with Forest Service personnel; it is doubtful that saleable quantities for firewood will be generated.

Once the slash has been removed, topsoil prestripping will begin in areas where salvageable soils are identified for removal with conventional earthmoving equipment. Topsoil materials will be moved or transported to designated storage areas. Stockpiles will be designed to minimize compaction and erosion effects due to wind and precipitation.

3.2 Interim Project Reclamation

Reclamation of disturbed areas concurrent with mining and leaching operations will be practiced wherever possible unless the particular area is subject to ongoing mine activities or planned exploration work at the project.

Exploration drill sites and roads in the project vicinity will be reclaimed if no further use is anticipated. Road areas and drill sites will be recontoured where feasible or, alternatively, graded and ripped to control erosion and reduce compaction of road and drill pad surfaces. Road crossings at drainages will be reopened to establish the preexisting drainage course. In areas where recontouring is not possible, waterbars or cross drains will be installed and the outer road fill bank graded down to minimize runoff accumulation and erosion potential. All recontoured and reclaimed surfaces will be revegetated with seeding efforts occurring during favorable planting times (late fall or early spring).

Other areas of mine project disturbance identified as available for interim reclamation will be reclaimed in a similar fashion and revegetated with an approved seed mixture.

3.3 Final Reclamation

As previously mentioned, a detailed reclamation plan will be developed which will take into account information developed from field studies of environmental resources and in consultation with Forest Service personnel. General final reclamation guidelines are outlined below and will be supplemented or modified as required after development of the final plan.

3.3.1 Open Pit

The open pit will be constructed with safety benches during mining activities to assure slope stability during mining. Upon mine pit abandonment, the benches will be left in place to reduce safety hazards and insure continued stability of pit walls.

Topsoil replacement will be considered along the pit wall benches, but will depend on the final bench widths needed based upon final pit design and in-pit conditions encountered during mining. In any event, safety benches will be broadcast seeded with an approved seed mixture where conditions are conducive to vegetative establishment. The pit bottom and pit perimeter areas will be topsoiled where feasible and reseeded. It is expected, however, that the pit bottom will be subject to groundwater inflow with ponding of water occurring. Final pit design and mining operation methods will be a key factor influencing whether water accumulation in the pit will occur.

3.3.2 Waste Dumps

The rock waste dumps will be created using truck end-dumping methods with the active dump face being developed at the angle of repose. At the completion of mining, the waste dump crests may be partially regraded to meet final reclamation and resource or land use goals.

Dump tops will be ripped and/or scarified to produce a rough surface and reduce material compaction. Stockpiled topsoil, removed prior to dump development, will then be applied to the scarified surface and reseeded with a seed mixture agreed upon in consultation with the Forest Service.

3.3.3 Roads

Ore and waste haul roads and ancillary roads in the mine office/maintenance and processing facility areas will be reclaimed according to the type of road and site specific conditions. Any roads which may be needed or desired after project completion will be identified in consultation with the Forest Service and left open for future use.

The smaller, light duty traffic roads will be recontoured to conform to natural slopes where feasible. In steeper and/or rocky terrain areas where recontouring is not possible, any safety berms and the associated road fill section will be

outsloped to provide drainage and the remainder of the road surface ripped or scarified. Drainage crossings will be reestablished as necessary. After recontouring, or outsloping and ripping, the areas will be reseeded. In most cases, topsoil reapplication will not be necessary to achieve revegetation of the reclaimed road.

The engineered haul roads in the mine site area will also be reclaimed according to construction type and site conditions. Recontouring of haul roads in flatter terrain areas will be accomplished by pulling the safety berm and a portion of the outside fill bank back onto the road surface. Drainage channel crossings will be reestablished to facilitate drainage, and culverts, where used, will be removed. Topsoil will be replaced on the recontoured road where reasonable equipment access is feasible.

Recontouring may not be achievable for haul road sections which are built with mine waste rock or along areas of steep and/or rocky terrain where the road was constructed using cut and fill (sidespill) methods. Safety berms will be pulled back onto the road surface and the fill bank portion of the road dragged down to allow natural drainage. The interior (cut bank) drainage ditch will be filled with material to allow unchanneled natural drainage across the road surface, thus minimizing the potential for runoff erosion.

Contour ripping or scarification will be done on recontoured or reshaped haul road areas where practical and desired. Seeding with an approved seed mixture will be accomplished on all reclaimed roads.

3.3.4 Office/Maintenance, Processing and Ancillary Facility Areas

The mine office/maintenance, ore crushing, and explosives storage areas, as well as other areas where ancillary facilities are located, will be reclaimed at the end of mining and leaching activities. All buildings and structures will be dismantled and

removed and, as appropriate, structural foundations broken up and buried. The facilities sites will then be regraded and contoured, ripped, topsoiled and reseeded. As much as practicable, reclamation efforts in these areas will be designed to restore original site productivity to those levels existing prior to installation of the facilities.

3.3.5 Heap Pad and Processing Ponds

Reclamation of the heap leach pad will have the goal of creating a contoured, topsoiled and revegetated mound which will blend into the surrounding topography of the saddle area where the pad will be located.

Upon completion of heap leaching at the project, the heap pad will be washed and solutions neutralized to bring down the pH and cyanide levels in the spent ore materials. State regulatory permit requirements will specify the procedures and objectives to be met in neutralization of the heap materials.

After sufficient neutralization of the heap is accomplished, heap edges will be recontoured and graded down to blend with the general area. Graded materials will be spread to cover all earthworks and the heap pad liner material immediately surrounding the leach pile. After contouring, the area will be topsoiled and revegetated. As necessary, drainage controls will be designed into the reclamation effort to insure that erosion is minimized.

The leach solution process ponds will be used during the heap neutralization process to collect and recirculate rinsing waters. After heap rinsing is completed, and free cyanide and chemical constituents of the rinsate are at acceptable levels, the process waters will be evaporated to dryness by either circulating the water in the ponds or spraying above the pond surface(s). After evaporation, the outer edges of the pond liner materials will be folded over the evaporate and buried in place. The pond site area will then be regraded to blend with the surrounding topography, permanent drainage established to control erosion, the area topsoiled, and finally, revegetated.

3.4 Fencing

The major land use activities in the project area at the present time includes livestock grazing, mineral exploration, and habitat for wildlife. Fencing needs in and around the project site during and after mining and processing activities will be based primarily on needs for protection of livestock and minimizing impacts on existing grazing use in the area.

Fencing will be provided around the heap leach pad, solution ponds, and process recovery areas to exclude livestock and big game from the area during operation. Drift fencing or exclusionary fencing in the open pit, waste dump, haul road and ancillary facility areas will be provided as identified in consultation with Forest Service personnel. After project completion, all project fencing will be removed except that required to protect the safety of livestock and any public land users who may occasion the project area.

After revegetation has been established to a sufficient level, most areas would be opened for livestock and wildlife usage to assist in attainment of post mining land use goals and objectives.

APPENDIX A

Project Land Status

(Submitted in original Operating Plan to:)

Humboldt National Forest
Mountain City Ranger District

APPENDIX B

Other Agency Permits/Approvals

Permit	Agency	Project Component/Comments
Federal		
∘ Section 404 Dredge and Fill Permit - Predischarge Notification, or - Individual Permit	Army Corps of Engineers	Activities in U.S. Waters
∘ Spill Prevention Control and Containment Plan	USEPA	Plan development after project startup
∘ Operation Commencement Notice	MSHA	
∘ Safety Training Program Plan	MSHA	Employee Safety Training Plan
∘ Explosives Permit Registration	MSHA - BATF	Storage, handling, use of explosives
∘ Endangered Species Impact Review	USFWS	Biological opinion, compliance with Act
State		
∘ Air Quality Construction and Operating Permit	NVDEP - Air Quality Section	Ore Crushing Facility
∘ Land Clearing Permit	NVDEP - Air Quality Section	Project surface disturbance areas
∘ Open Burning Authorization	NVDEP - Director	Open burning of refuse
∘ Zero Discharge Permit	NVDEP - Water Pollution Control Section	Waste dumps, leach pad, processing facilities
∘ Individual Sewage Disposal System Permit	NVDOH - Bureau of Environmental Health	Sanitary waste disposal facilities

Appendix B (continued)

Permit	Agency	Project Component/Comments
◦ State (continued)		
◦ Water Rights Appropriation Permit	NVDEP - Division of Water Resources	Project water supply(s)
◦ Solid Waste Disposal Permit	NVDEP	Waste disposal landfill
◦ Wildlife Habitat Modification Review or Permit	NV - Department of Wildlife	Review of project impacts on wildlife
◦ Archeological, Historic Clearance	NV - SHPO	Review of project area cultural values
◦ County		
◦ Special Use Permit	Elko County	Project surface disturbances
◦ Building Permit	Elko County	Project buildings, surface structures
◦ Zoning Compliance	Elko County	Project compliance with county zoning ordinances