CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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DRAFT

ENVIRONMENTAL ASSESSMENT
NEWSBOY GOLD MINE

EA No. AZ-026-92-39

Maricopa County, Arizona

Lead Agency:

U.S. Department of the Interior
Bureau of Land Management
Phoenix District Office
Lower Gila Resource Area
Phoenix, Arizona 85027

Third Party Contractor:

Fletcher Associates
17740 East Hinsdale Avenue
Aurora, Colorado 80016

Comments on this EA should be directed to:

John R. Christensen
Area Manager
Lower Gila Resource Area
Bureau of Land Management
2015 West Deer Valley Road
Phoenix, Arizona 85027
(602) 863-4464

Completion Date:

July 13, 1992

John R. Christensen
Area Manager
Lower Gila Resource Area

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Summary

Newsboy Gold Mining Company has submitted a Mining Plan of Operations to the Bureau of Land Management (BLM) to develop a gold mine on public lands located approximately 10 miles south of Wickenburg, Arizona. The proposed project will affect a total of approximately 260 acres, including an open pit mine, a processing plant with a cyanide vat leach employing carbon-in-leach adsorption, waste rock dumps, and a tailings impoundment. The affected public lands are in Sections 21, 22 and 28, T6N, R4W.

Environmental baseline surveys were conducted, and an impact analysis was performed for each environmental resource. No cumulative or significant adverse impacts were identified during the evaluation. The proposed mitigation program, including reclamation, was determined to be satisfactory for each environmental resource, with the exception of wildlife.

The BLM has recently prepared the Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona, October 1990. This Strategy outlines a compensation program to protect habitat. The applicant will set aside a minimum of 520 acres which will not be disturbed during the life of the operation.

Other issues which were identified as major concerns, and which are addressed in this draft Environmental Assessment are:

- Dust;
- Noise;
- Blasting;
- Lights (nighttime);
- Traffic/Access;
- Threatened & Endangered Species;
- Waterfowl and Cyanide Ponds;
- Water Consumption;
- Cultural Resources; and
- Reclamation.

Critical elements of the human environment have been considered, and are discussed in Section 4.12, page 4-19.

Public participation in the review of this proposed action is important in the National Environmental Policy Act (NEPA) process. A Public Information Meeting was held in Wickenburg, Arizona on May 28, 1992, and approximately 65 people were in attendance. Public comments on this draft Environmental Assessment will be accepted until July 13, 1992.

1.0 Introduction, Purpose and Need

1.1 Introduction

Newsboy Gold Mining Company (NGMC) submitted a Mining Plan of Operations (MPO) to the Lower Gila Resource Area, Phoenix District Office of the BLM. The MPO describes open pit mining and processing of gold ore on public lands under BLM jurisdiction.

The general location of the project is indicated on Figure 1-1 (page 1-2). The property boundary encompasses public lands, state leases, and a private lease, totaling approximately 18,000 acres, as indicated on Figure 1-2 (page 1-3). The proposed project will affect 260 acres of patented and unpatented mining claims in portions of Sections 21, 22 and 28, T6N, R4W.

1.2 Purpose and Need

The purpose of the proposed action would be to develop a precious metal resource and extract gold in a milling process. Gold, as a precious metal, is distinguished from other major commodities on domestic and foreign markets because of its investment qualities.

For the 1990s, jewelry fabrication is expected to remain the single most important use for gold [Goldfields 1990]. During the coming decade, gold production is expected to continue to increase from the Western countries, in particular the United States. This production increase is expected to offset anticipated decreases in production in South Africa and the Soviet Union. As a result, gold is becoming an important export commodity for the United States as its increasing production is used to satisfy strong overseas demand for jewelry and gold investment uses. [Betze, 1991]

The proposed project conforms with the BLM's land management policy as outlined in the Lower Gila North Management Framework Plan - March, 1983. The project was also evaluated for its conformance with existing land use restrictions imposed by Maricopa County. The project is in conformance with county regulations and will meet the Class I Standards of the Draft Wickenburg Highway Scenic Corridor Plan, January 1991. [Maricopa County, 1990 and 1991]

BLM, as the federal land manager, must evaluate proposed actions on public lands to ensure that federal laws are complied with, and that potential multiple use problems can be resolved or mitigated. The BLM must review the proposed action and alternatives, and must select a preferred action which will prevent unnecessary or undue degradation of federal lands. Specifically, cultural resources must be protected, as well as threatened and endangered plants and animals.

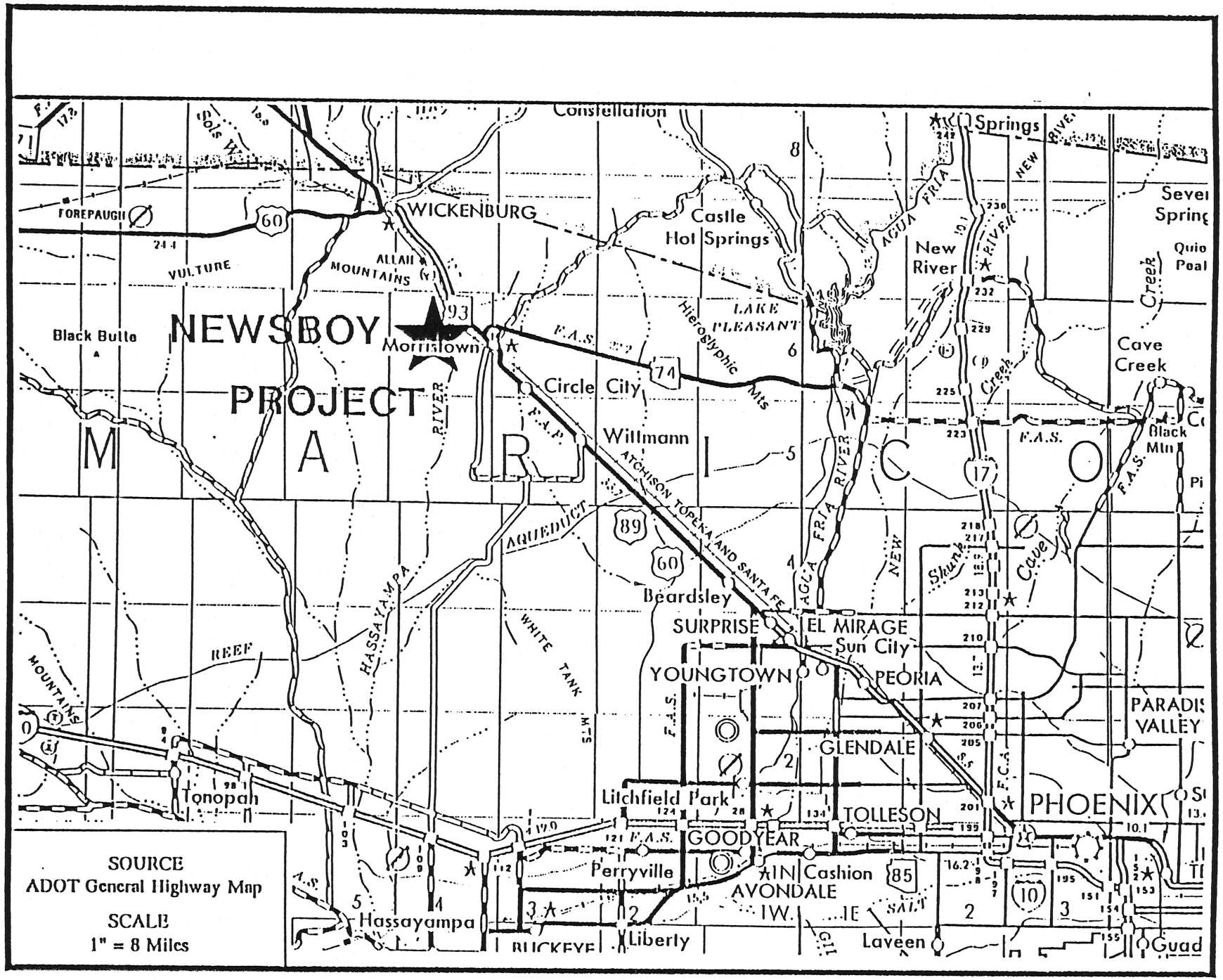
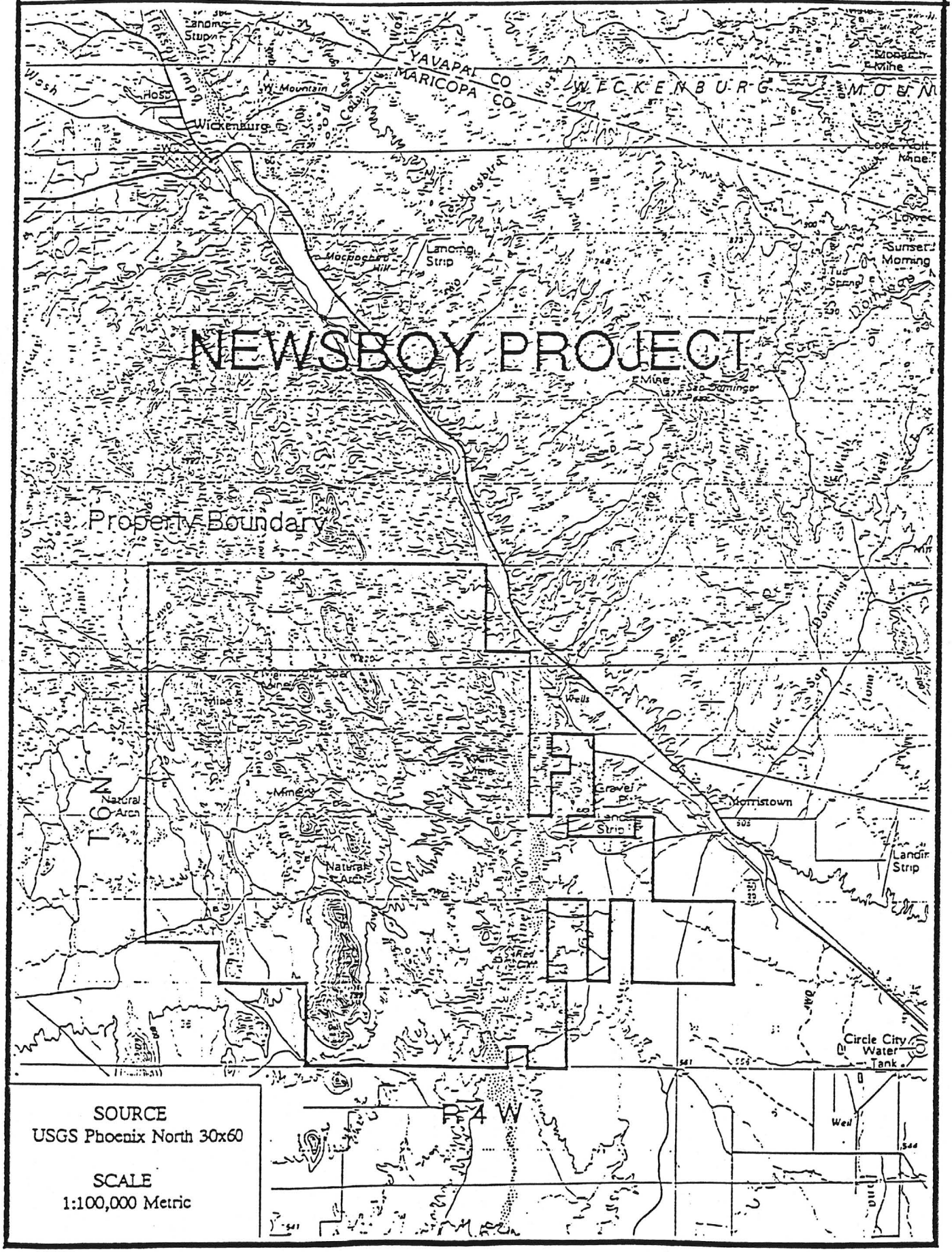


Figure 1-1
PROJECT LOCATION

Figure 1-2
PROJECT AREA



The Draft Environmental Assessment (EA) has been prepared to comply with the Council of Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) (40 CFR 1500-1508) and BLM regulations for surface mining of public lands (43 CFR 3809), using BLM guidelines for implementing NEPA [Arizona Environmental Handbook H-1790-1 and the BLM Arizona State Office Cyanide Management Plan, April 1992]. The purposes of the EA are to:

1. Assess the environmental impacts of the proposed action and reasonable alternatives;

2. Identify and analyze significant and cumulative environmental impacts from implementing the proposed action and other reasonable alternatives; and

3. Provide the decision maker and the public the opportunity to respond and comment on the analysis of the environmental impacts of the proposed action and reasonable alternatives.

1.3 Background

NGMC proposes to: develop an open pit gold mine which will affect 58 acres; construct a 1,650 ton/day Carbon-in-Leach (CIL) processing facility on 10 acres; stack waste rock on 63 acres; dispose of tailings on 101 acres; build an additional 13 acres of roads; and affect approximately 15 acres with miscellaneous surface disturbance activities, for a total of 260 acres.

The major issues and concerns which were identified during meetings and discussions are:

1. Dust from haul roads;
2. Noise from blasting;
3. Nighttime lighting of the operation;
4. Traffic access along Gates Road;
5. Threatened and Endangered species;
6. Containment of cyanide;
7. Pollution of water resources; and
8. Reclamation.

These major issues and concerns, as well as other NEPA compliance requirements, will be addressed in the EA process

1.4 Authorizing Actions

In addition to the EA, implementation of the proposed Newsboy Project or the reasonable alternatives would require authorizing actions from the BLM and other federal, state, and local agencies with jurisdiction over the project. Authorizing actions are land use or environmental permits, licenses, or approvals required for project construction or operation. Table 1-1 summarizes the principal authorizing actions required for the proposed Newsboy Project.

Table 1-1
AUTHORIZING AGENCIES

AUTHORIZING AGENCY	REGULATORY DOCUMENT / APPROVAL
Bureau of Land Management	- Mining Plan of Operations - National Environmental Policy Act - National Historic Preservation Act - American Indian Religious Freedom Act - Endangered Species Act
U.S. Army Corps of Engineers	- 404 (Dredge and Fill) Permit
Arizona Department of Environmental Quality	- Aquifer Protection Permit
Arizona Department of Water Resources	- Dam Safety Permit - Well Permits
Arizona State Historic Preservation Office	- Historic Mitigation Program
Arizona Department of Agriculture and Horticulture	- Native Plant Law Compliance
Maricopa County	- Air Quality Permits - Site Permit - Septic Permit

2.0 Proposed Action and Alternatives

The proposed action and alternatives, including the "No Action" alternative, are described in the following sub-sections. Alternatives considered but rejected are briefly described, along with reasons for their elimination.

Mitigation measures (real, committed, and enforceable) which reduce or eliminate environmental impacts are presented. Consideration has been given to policy or legal constraints which affect the proposal, including the Threatened and Endangered Species Act, Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona, and the National Historic Preservation Act.

2.1 Proposed Action

The Newsboy Project is located approximately 10 miles southeast of Wickenburg in Maricopa County, Arizona (Figure 1-1, page 1-2). It is being developed by Newsboy Gold Mining Company (NGMC) on 260 acres of patented and unpatented mining claims on federal lands under the jurisdiction of the BLM.

NGMC's property encompasses approximately 18,000 acres as indicated by the property boundary on Figure 1-2 (page 1-3). Land classifications are listed below in Table 2-1.

Table 2-1
LAND CLASSIFICATIONS

LAND CLASS	TOTAL ACRES	ACRES TO BE DISTURBED
Unpatented	12,460	245
State Leases	5,400	
Patented	63	15
TOTAL	17,923	260

During the life of the operation, approximately 15 million tons of material (5 million tons of ore and 10 million tons of waste rock) will be removed from the pit. The orebody will be mined using conventional open pit mining techniques and mining equipment. The planned ore mining rate is 600,000 tons/year. Waste rock will be mined at an average rate of 2 million tons/year. The final pit will cover approximately 58 acres. The projected life of the mine is 5 years, with ore production varying during the mine life. Construction and final reclamation will add 1 to 1½ years to the project activities.

Ore from the pit will be transported to the crushing plant prior to being conveyed to

the grinding mills. The crushing plant is designed at a maximum through-put rate of 2,500 tons per day. The mill is designed for a maximum of 1,650 tons per day. This allows for stockpiling of ore in the event that mining is disturbed or shut down for weekends or holidays. The mill will produce about 27,000 ounces of gold and 150,000 ounces of silver per year, using a dilute cyanide solution in the carbon-in-leach (CIL) tanks. Tailings from the mill will be pumped to a tailings disposal area for final placement and reclamation.

2.1.1 Existing Access Route

The proposed access will be along an existing access route. The project area can be reached following State Highway 60 south from Wickenburg approximately 10 miles to the Gates Road. The access route then proceeds west along Gates Road about 2 miles across the dry bed of the Hassayampa to the project. Maintenance of the road will be coordinated with the county.

The Hassayampa is dry most of the year, and access has not been a significant problem. For dry weather access, steel grates or other crossing material may be placed on the dry bed of the Hassayampa and may be retained with steel bars.

Once across the Hassayampa, the applicant will have a controlled access road to the plant site. This road will be maintained with a water truck and road grader. The road will have a gate and will be posted with adequate signs to inform the public. General public access to the areas west of the operation will be located on the north side of the project area.

Increase in traffic will occur on the Gates Road from 40 commuting employees. Service trucks will bring fuel, parts and equipment to the project site on a daily basis.

2.1.2 Existing Surface Disturbance

The Newsboy Project is located in the Vulture Mining District, where gold was first discovered in 1863. Records indicate that mining within the project area began in the 1880s. Production of gold, silver and associated base metals continued intermittently from the 1880s to the 1950s. During the 1970s and 1980s, several companies examined the property, and extensive drilling programs were undertaken. The geometry and grade of the orebody was determined by the drilling of 102 reverse circulation holes. Data generated during this period indicated that the orebody extended north, south and east of the current exposure in the old Newsboy pit.

In 1990, NGMC obtained a purchase agreement from Westmont Mining, Inc. After conformation drilling and extensive metallurgical testing, NGMC has proceeded with design engineering and feasibility studies to develop the deposit.

Existing surface disturbance at the project site is extensive. The area has been explored and mined, providing several miles of access roads. In addition, an area

was cleared for processing in the 1960s. An estimate of the existing surface disturbance is 15 acres.

2.1.3 Proposed Surface Disturbance

NGMC has developed a general site plan (Figure 2-1, page 2-4) to indicate the major areas of proposed disturbance. The maximum proposed surface disturbance is listed in Table 2-2.

Table 2-2
PROPOSED SURFACE DISTURBANCE

	Acres
Open Pit	58
Waste Rock	63
Tailings	101
Roads	13
Plant	10
Miscellaneous	15
Total	260

2.1.4 Mining Operations [NGMC, Mining Plan of Operations, 1992]

The Newsboy orebody will be mined using conventional open-pit mining techniques and standard mining equipment, as listed in Table 2-3. NGMC plans to use a contract mining company. The actual equipment, manufacturer, and capabilities may vary with the contractor's selection of specific equipment.

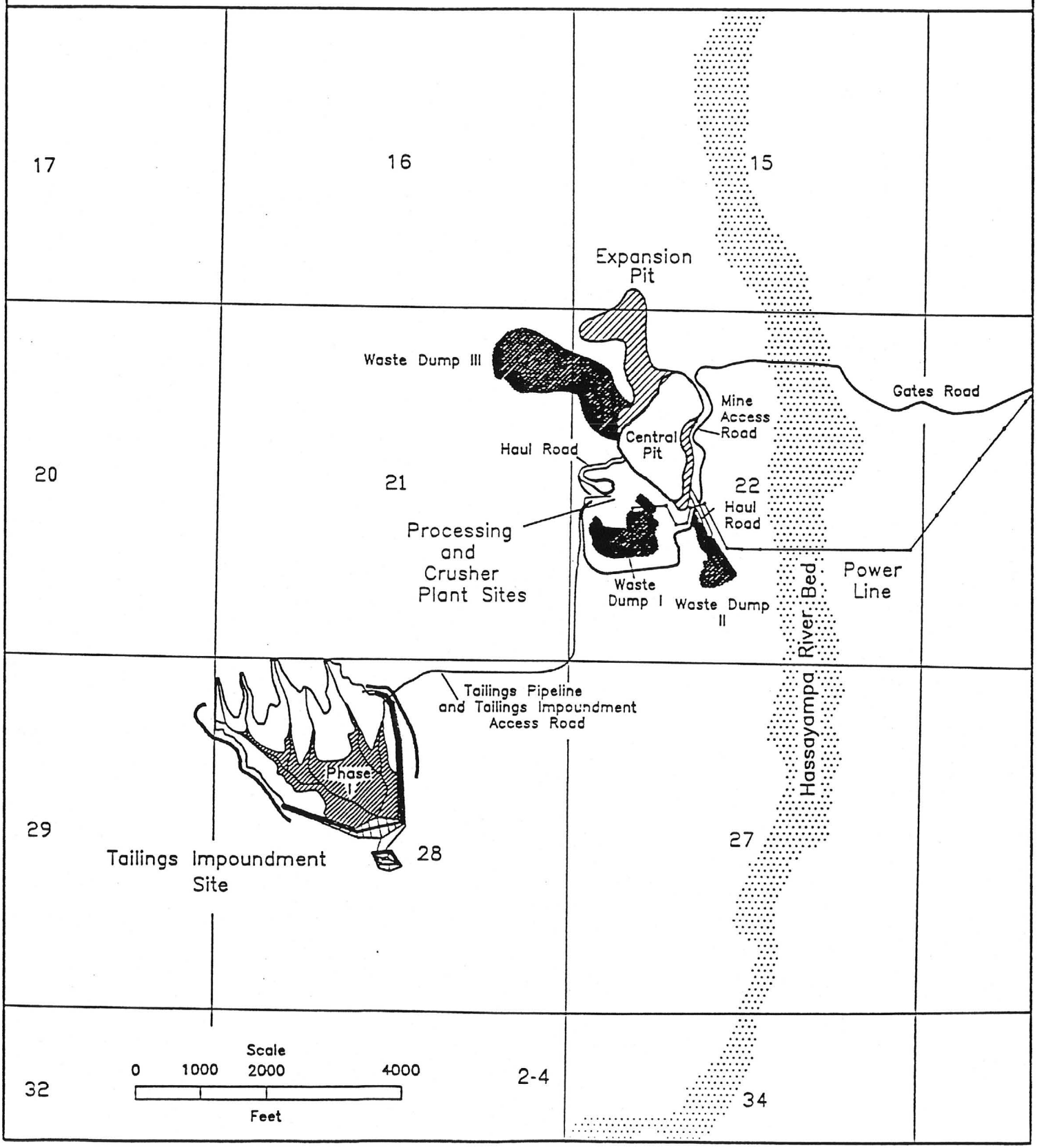
Table 2-3
MINING EQUIPMENT

Type of Equipment	Quantity
Loader - Cat 992C	1
Loader - Cat 988D	1
Dozers - Cat D9N	2
Haul Trucks - Cat 773B	8
Motor Grader - Cat 14G	1
Rotary Drill	1
Service Trucks	2
Pick-up Trucks	10

Figure 2-1
SITE PLAN

Maricopa Co., Arizona, U.S.A.

Township 6 North, Range 4 West



Pit slopes will vary according to the geometry of the orebody. The steepest portions of the highwall will be 60° to 70° and the pit will daylight with a gentle slope to the west. Waste rock will be mined on 20 foot benches, and the ore will be mined on 10 to 20 foot benches to optimize ore grade control. Drill holes will be spaced to maximize fracturing.

2.1.4.1 Drilling and Blasting Procedures

Drill patterns will be laid out in accordance with a monthly mine plan. A rotary blast hole drilling rig will drill a 6-inch to 8-inch hole to a depth of 20 to 25 feet. Blast holes will be loaded with an ammonium nitrate based blasting agent, plus a high-explosive primer. Blasting will only occur between 8 am and 5 pm. There will be no blasting during night time hours.

All explosives required for blasting will be stored in a barricaded magazine. The storage area will be designed to meet the standards of the Mine Safety and Health Administration.

2.1.4.2 Waste Rock Disposal

The mining operation will utilize three waste rock disposal areas, as indicated on Figure 2-2 (page 2-6). The initial waste rock dump will be at the plant site. The material will be used to level and expand the area to the south. A small site will be located south of the pit, and the main waste rock dump will be northwest of the pit. The total area disturbed by waste rock will be 63 acres.

Under the current mine plan, production of waste rock is projected at approximately 2.1 million tons annually. The waste rock will be hauled using end-dump trucks.

Haul roads will be 65 feet wide with a safety berm. The maximum slope will be 10%. All haul roads used for hauling waste rock will be watered and/or chemically treated with a BLM-approved dust suppressant. A grader will be used as needed.

2.1.4.3 Ore Mining and Stockpiling

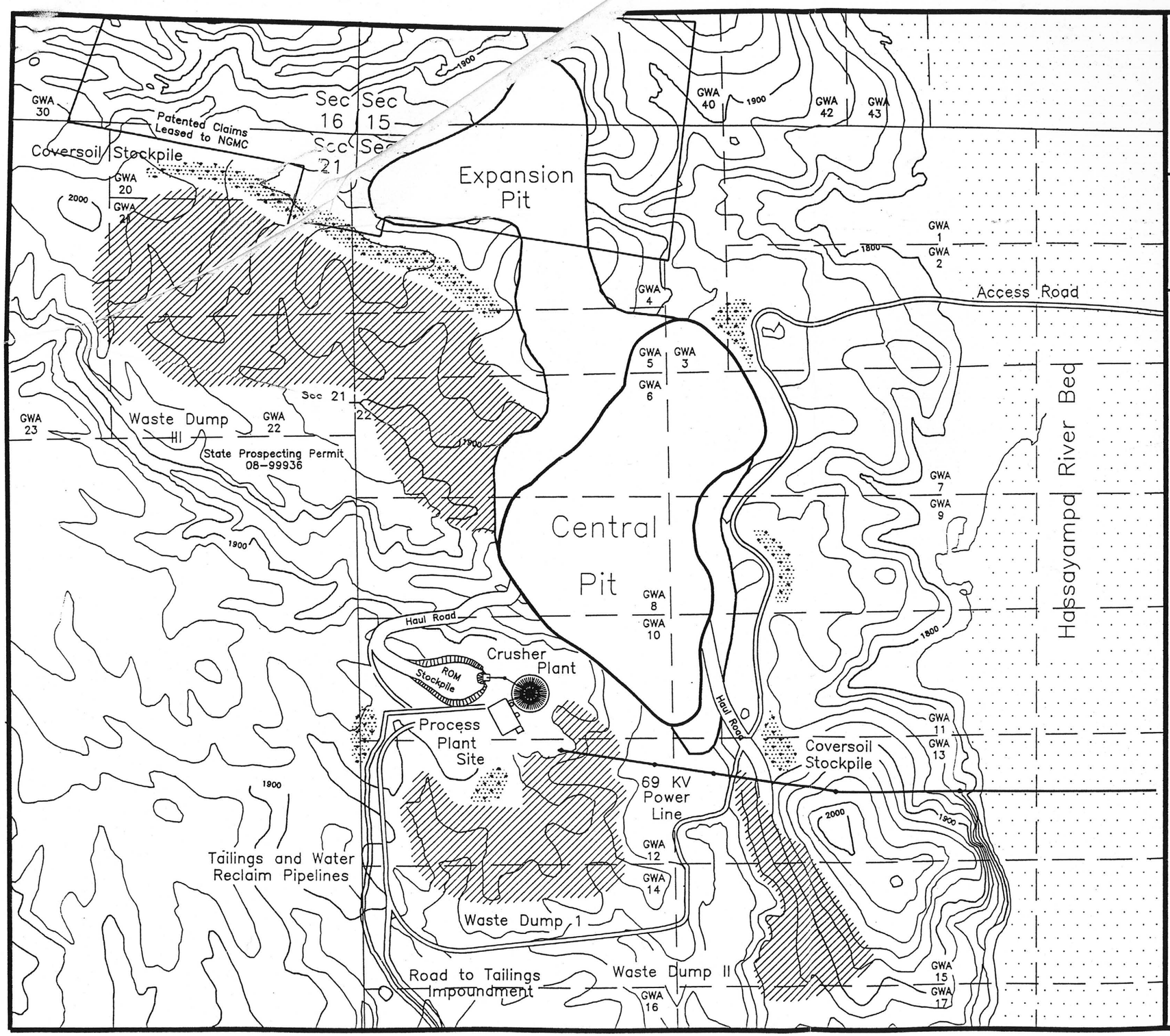
Annual ore production is expected to be 600,000 tons, or 50,000 tons per month. Ore resources are estimated at 5 million tons. After blasting, the ore will be loaded into haul trucks. The haul road to the plant will be 65 feet wide with a safety berm. This haul road will be watered and graded to minimize dust.

Ore will be placed in an ore stockpile or will be dumped directly to the primary crusher. The stockpile will have sufficient volume to run the mill during periods of non-operation of the mine.

Newsboy Gold Mine

Maricopa Co., Arizona, U.S.A.
Township 6 North, Range 4 West

Figure 2-2
MINE SITE



Contour Interval 20 Feet

Scale

0 500 1000 1500

Feet

2.1.4.4 Crushing Plant

The crushing plant will operate 7 days per week, 24 hours per day. The feed rate of the crushing plant is 2,500 tons per day. The plant is designed with excess capacity to allow for maintenance and periods of non-operation. The plant will have a vibrating grizzly screen; primary, secondary and tertiary crushers; conveyors; and undersize screens. (Figure 2-3, page 2-8)

To meet Maricopa County requirements, dust will be controlled by conventional methods which may include the use of water sprays, dust filters, or baghouses. Overall design and dust emission parameters are subject to review and permit issuance by the Maricopa County Bureau of Air Pollution Control.

2.1.4.5 Processing Plant

Grinding, carbon-in-leach (CIL) adsorption, elution, and gold recovery circuits are interconnected processes for gold recovery. The processing plant is designed to provide a safe, closed and contained gold recovery environment. Cyanide in dilute form will be used to dissolve the gold. All cyanide in the processing plant is contained in storage vessels or in the carbon leach tanks, and the tanks are interconnected with piping. The tanks and piping are designed and constructed to enable a visual inspection to check for potential leaks. The concrete retaining walls of the plant act as a secondary containment if one of the tanks would rupture. The concrete floor is sloped to a sump. Any leaks or spills would be pumped from the sump to another tank. (Figure 2-3, page 2-8)

2.1.4.6 Tailings Disposal

The tailings impoundment is located in Section 28, approximately 6,200 feet from the processing plant (Figure 2-4, page 2-9). Tailings will be pumped through a pipe to the tailings area. The pipe will be placed in a lined ditch or inside a secondary pipe to contain any leaks. Visual inspection of the pipeline will be made daily. The pipe will also be designed with pressure shut-off valves. If a major rupture occurs, the pump will automatically shut off. [Lyntek, 1992]

The impoundment has been designed to protect surface water and groundwater. The impoundment design must be approved by the BLM and Arizona Department of Environmental Quality.

The tailings impoundment will be built in three phases. Each phase will have a 40-mil synthetic HDPE liner laid over a compacted native clay sub-base as a second liner. The synthetic liner sheets will be welded at the seams to provide one continuous barrier. A drainage pipe system will be laid on top of the liner to drain and transport the process solution to the reclaim/recycle pond.

The tailings will be deposited using a cyclone, so that the coarse tailings will be placed adjacent to the toe dam. Process solution and finer tailings will flow toward the upper

Figure 2-3
PROCESS PLANT and
CRUSHER SITES

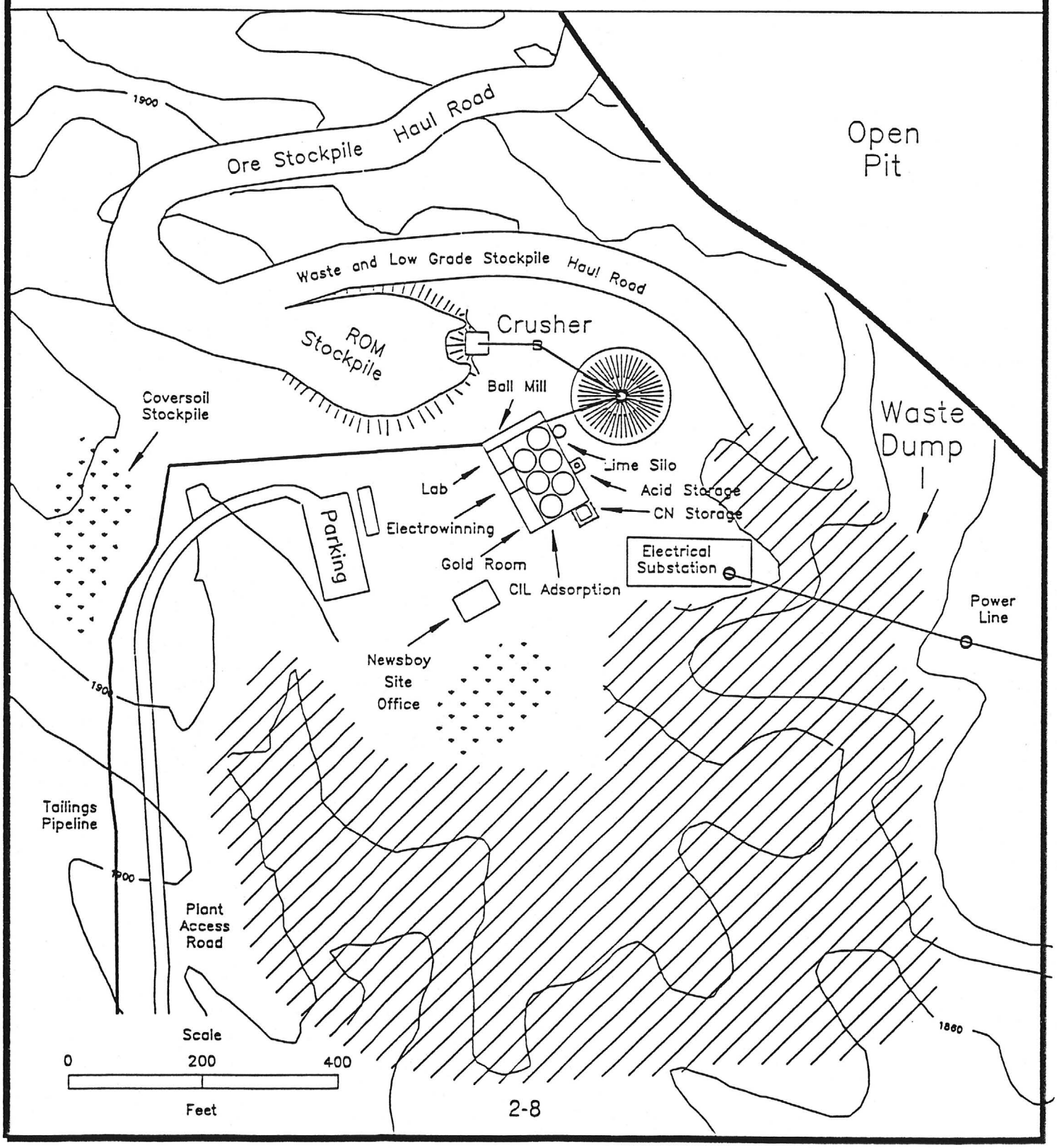
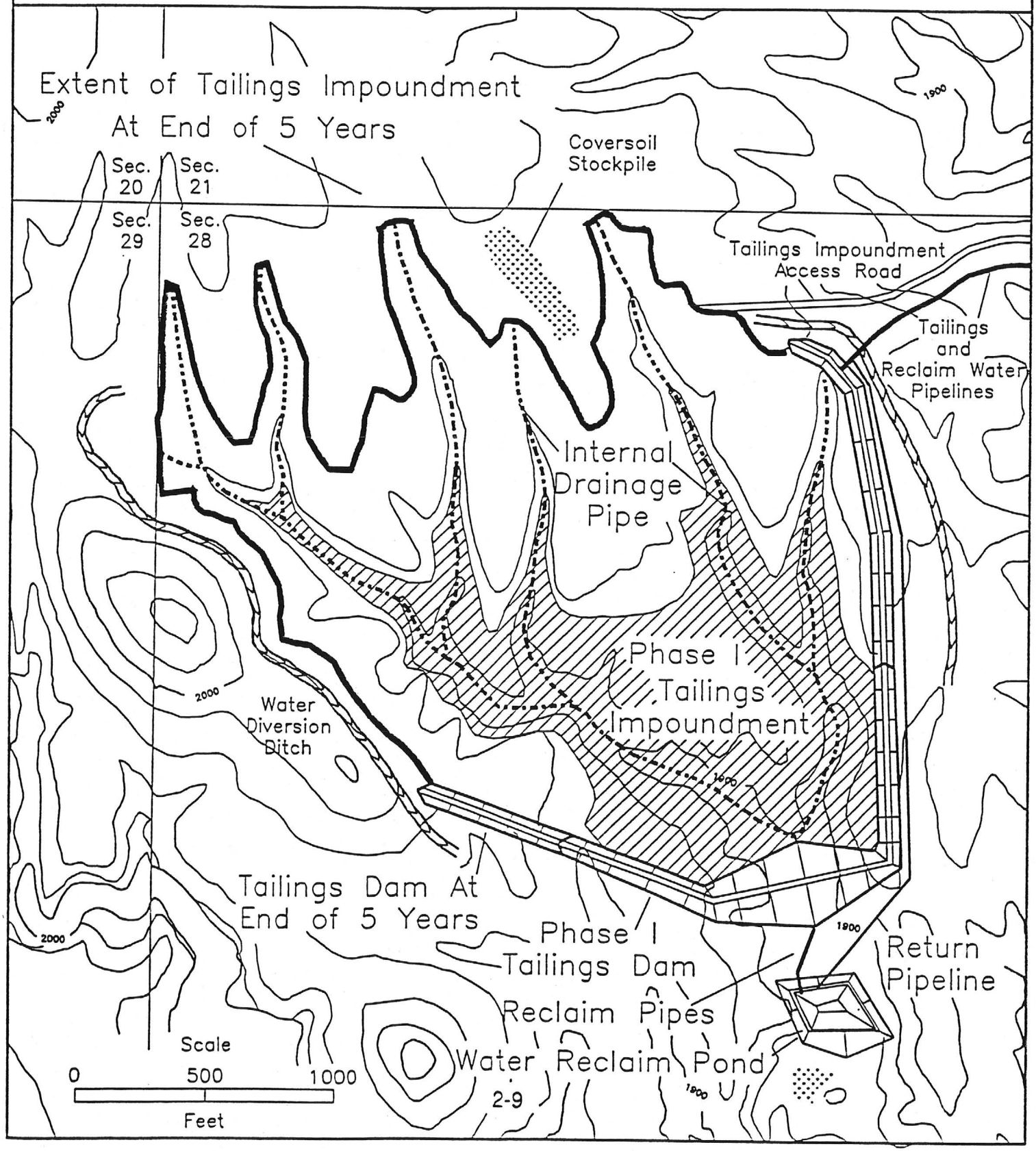


Figure 2-4
TAILINGS
IMPOUNDMENT SITE

Maricopa Co., Arizona, U.S.A
Township 6 North, Range 4 West



end of the liner and drainage pipe system. The ore is coarse, and very little slimes have been separated in the gold recovery tests. The overall coarseness of the tailings will increase the drainage of the process solution to the reclaim/recycle pond. The impoundment has been engineered to gravity-drain the tailings with minimal ponding.

The reclaim/recycle pond (Figure 2-5, page 2-11) will receive and store the process solution. The pond will be enclosed by a 6 to 8 foot chain link or HDPE mesh fence. A tight wire mesh will be attached along the bottom two feet of the chain link. The pond surface will be covered with a floating cover, and netting will be considered as an additional deterrent. These protection procedures are designed to minimize or eliminate wildlife access to the process solution.

Additionally, the process solution is recycled to the processing plant; therefore, evaporation is greatly reduced. Fresh water is required as part of the make-up water for processing, since 100% recycling cannot be achieved. Wildlife water areas will be established away from the processing activities. Fresh water pipelines will distribute water to shallow, galvanized metal tanks or bird guzzlers to help mitigate wildlife attraction to the process solution areas and provide a source of fresh water for wildlife.

The reclaim/recycle pond will also have a compacted native soil base. A 40-mil HDPE synthetic liner will cover the base. A geofabric leak detection liner will be laid down and sloped to a leak detection sump. A second 40-mil HDPE synthetic liner will be installed over the geofabric. Solution will then be added to the pond. If a leak occurs, it will be intercepted in the geonet and observed in the sump. The bottom liner will still be in place to prevent the leak from penetrating into the compacted soil base.

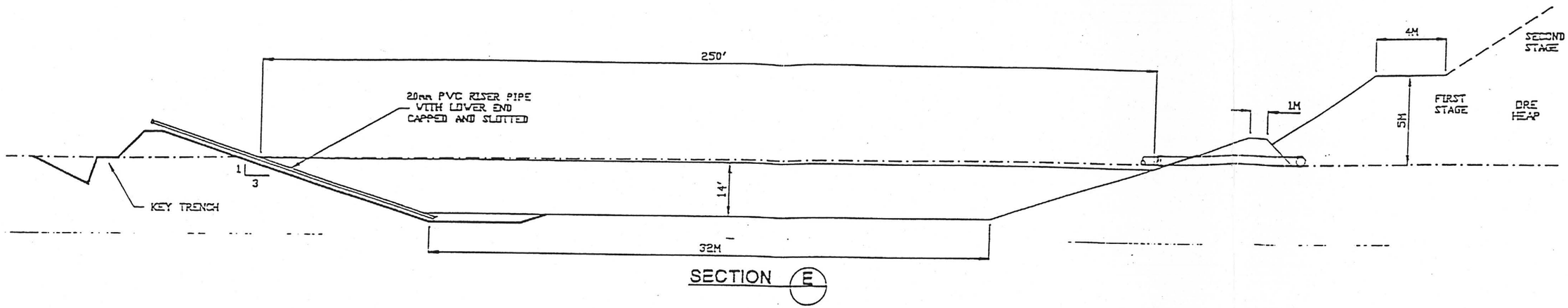
A reclaim/recycle pipeline will be installed in the lined ditch containing the tailings pipeline. This reclaim/recycle pipe will allow process solution to be pumped back to the processing facility from the reclaim/recycle pond. The estimated total recycle of water is approximately 60%.

Diversion ditches will be constructed above the tailings impoundment to divert surface runoff away from the impoundment. The diversion ditches will be designed to channel runoff from a 100-year, 24-hour storm event. The tailings impoundment is designed to hold the runoff from a 100-year, 24-hour storm event which would fall within the impoundment area.

The reclaim/recycle pond can also hold the runoff from the tailings area. A valve system will be placed on the drainage pipes in the tailings impoundment to regulate major storm event flow between the impoundment and pond. This redundant system allows dual surface water control for major storm events.

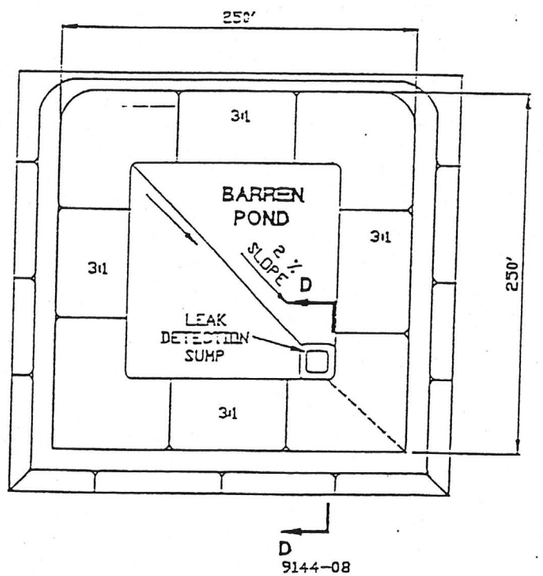
The applicant is preparing a surface water/groundwater monitoring manual. The manual will be made part of the BLM MPO approval and the Arizona DEQ APP approval. The manual will outline the places, times and sampling procedures for the environmental technician. Each area designated in the manual will be sampled and initialed by the technician, with the date, time, and results. The daily log will be made

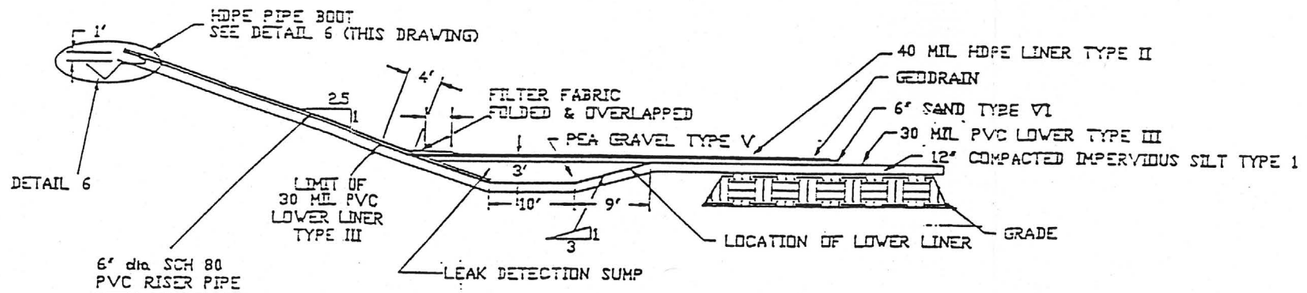
Figure 2-5
DETAILS OF
WATER RECLAIM POND



SECTION E

PAD & POND CROSS SECTION





Typical Pond Leak Detection Sump
Elevation

SECTION D

DETAILS OF
RECIRCULATION POND

NO.	REVISIONS	BY	APP'D

NEWSBOY

PAD & POND LEAK DETECTION

INTER INC.

NO.	DWG. NO.	TITLE		
		DRAWING TITLE	CAD-ID	G.JM
		REFERENCE DRAWINGS	CKD.	–
			APP'D	–
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			SCALE	NONE

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part of the permanent record for environmental monitoring. These monitoring records will be available for review by environmental agencies and the public.

The monitoring program will include visual inspections of pipes, tanks, ditches and process solution structures, as well as leak detection pipes and sumps, and the monitoring wells located near each component of the processing facility.

Action levels will be established for quantity and quality of solution found in leak detection sumps or monitoring wells. In addition, reporting or chain-of-command steps will be outlined in the manual, with persons and telephone numbers for work and home.

This strong mitigation program will minimize potential impacts to the surface water and groundwater.

2.1.5 Mine Support Facilities

2.1.5.1 Buildings

The major on-site building will be the processing plant. The metallurgical lab will be constructed adjacent to the processing plant, in its own building or trailer. Mobile trailers will be used in lieu of permanent buildings for the mining contractor's office, change facilities, and NGMC personnel. No permanent maintenance building will be required. The NGMC administrative office will be located on private property in Morristown.

2.1.5.2 Reagent and Fuel Storage

Reagent Storage

- Reagents will be stored within the containment areas of the plant or outside in bermed and synthetically lined areas.
- Bulk lime will be delivered by vendors and stored in 40-ton bins.
- Cyanide will be delivered in liquid or dry bulk form, depending upon the vendor. The cyanide will be stored in a secure area marked with signs.
- Caustic (sodium hydroxide) will be delivered in liquid form and will be stored in designated tanks.
- Hydrochloric acid will be delivered and stored in special tanks designed and labeled for acid only.

Fuel Storage

- Diesel and gasoline will be stored in above-ground tanks. The tanks will be placed in a bermed and clay or synthetically lined area.

2.1.5.3 Reagent and Fuel Consumption

Reagent Consumption

-	Lime	522 tons/year
-	Cyanide	700 tons/year
-	Caustic	187 tons/year
-	Hydrochloric Acid	211 tons/year

Fuel Consumption

-	Diesel	200,000 gallons/year
-	Gasoline	8,000 gallons/year

2.1.5.4 Electrical Power

Electrical power will be supplied by Arizona Public Service from an existing 69 KV transmission line. A new substation will be constructed, and three miles of new 69 KV line will be strung to the project site.

2.1.5.5 Water Source and Use

Groundwater is available on the project site. A series of test borings will be completed to assure an adequate supply of groundwater. The project's average net process water requirements are 100 gpm, or 160 acre feet per year. The highest water requirements will be about 150 gpm in June, and the lowest will be about 75 gpm in December. Groundwater use permits will be filed with the Arizona Department of Water Resources.

2.1.5.6 Access Roads

Existing access roads will be used to reach the project area. A haul road will be constructed west and south of the pit to reach the plant area. Public access will be rerouted north of the pit to provide access to the Vulture Mountains.

2.1.5.7 Drainage Control

The entire project area will be designed for drainage control. Diversion ditches will be placed to protect structures and handle the 100-year, 24-hour storm event.

2.1.5.8 Sanitation and Solid Waste Disposal

Septic tank and leach field systems are planned at the process plant. Portable toilets will be located around the area. A contractor will periodically empty the portable toilets. Non-hazardous solid waste will be hauled to the Morristown landfill as required.

2.1.5.9 Fire Protection

A fresh water storage tank at the processing plant will be used for fire protection. Fire extinguishers will also be present in buildings and on vehicles.

2.1.6 Reclamation and Closure Plan

2.1.6.1 Reclamation Goals

The long-term objective of the reclamation plan is to establish a post-operational environment compatible with the post-mining land use of the site. Specific goals of the reclamation plan are to:

- Create erosionally stable land forms for the tailings, waste rock dumps, and other disturbances;
- Divert ephemeral drainages around the tailings, waste rock dumps, and mine pit;
- Eliminate safety hazards by neutralizing the tailings impoundment and by fencing the mine pit's high wall;
- Grade disturbed areas and replant cacti; and
- Restore the land to long-term, multiple use.

2.1.6.2 Decommissioning

Concrete Foundations

Foundations of the buildings and crushers will either be removed and buried elsewhere on site, or will be buried in place. Facility areas will be recontoured to promote drainage.

Groundwater Wells

All groundwater wells, especially artesian wells, will be considered for use in range or wildlife projects by the BLM; all wells not needed for this purpose outside the pit will be plugged to meet Arizona's hole plugging standards, as regulated by Arizona Department of Water Resources.

Reclaim/Recycle Pond

The reclaim/recycle pond will be drained, and the solution will be detoxified and disposed of in conjunction with overall mine reclamation. Other techniques, including recycling, may be considered.

All solutions must be reduced to concentration of less than 0.2 mg/l weak acid dissociable (WAD) cyanide. Acceptable treatment or detoxification methods include, but are not limited to, natural degradation, dilution, oxidation, reverse osmosis, physical removal, or regeneration. Excess solutions present at closure may be disposed of by:

a. Reduction through evaporation;
b. Physical removal from the mine site to an approved site via Department of Transportation approved methods;
c. A combination of a. and b.; or
d. Other acceptable methods.

The reclaim/recycle pond sludge will be tested by the operator to determine if the sludge will require additional measures in order to meet applicable State, Federal, and local solid waste regulations.

Tailings Impoundment

Upon termination of the active use of tailings impoundments, representative samples of the material deposited in the impoundment must be collected and characterized. The tailings must be stabilized during the final closure of a facility so as to inhibit the migration of any contaminant that has the potential to degrade water.

Sampling of tailings solids may be necessary to evaluate residual cyanide and metal content and the potential for spiked releases. Capping with a low permeability material may be necessary if tailings are difficult to detoxify and represent a substantial environmental threat. All ponded solution in tailings impoundments will be removed during reclamation. The area will be reshaped so as not to collect and pond precipitation.

Equipment Disposal

All containers and barrels will be disposed of under applicable state regulations. The processing plant, vats, and tanks will be detoxified, dismantled, and removed from the site upon completion of mining operations. All mobile equipment will be removed from the site.

2.1.6.3 Final Contours and Slopes

Waste Rock Dump

The top surface of the dump will be built to slope gently (1% to 4%) from the dump crest to the hillside at the western edge. The backslope is designed to keep storm runoff from running over the dump crest and eroding the side slopes. The tip of the dump will be maintained with a fairly smooth surface for later application of coversoil. The side slopes will be constructed at the angle of repose (1.5:1), and no additional grading is proposed. The side slopes will naturally stabilize and may appear prominent for several years.

Tailings Impoundment
Tailings material will be resloped after detoxification, prior to placement of the waste rock cover. Grades will be sufficient to allow coversoil replacement, allow vegetation establishment, and to prevent erosion and exposure of cyanidated material. Detoxified material may be pushed off the liner to achieve the desired slope reduction.

Perforation of the liner material may be required after detoxification is completed to prevent solution build-up within the reclaimed impoundment. Diversion ditches will remain in place around the tailings impoundment after reclamation. These ditches have been designed to pass runoff from a 100-year, 24-hour storm event.

The post reclamation configuration of tailings impoundments will include a point adequate for representative monitoring of any leachate that may be generated and discharged to the environment. This collection point will be maintained during the post reclamation monitoring period.

Mine Pit
No final contouring is planned for the mine pit. Roads, slopes, benches and rims will be maintained during the life of the operation and will be in a stable condition when operations cease. The design slopes are 60^{0} to 70^{0} depending on rock type. The haul road and safety bench will be left intact.

Reclaim/Recycle Pond
After the pond is dry, the liner material may be folded, ripped, and buried (at least 5 feet below the surface) in the pond area in such a manner as not to impound post-reclamation water movement. The pond area may be backfilled and reshaped to conform with the surrounding topography and in a manner which will not collect surface water flow or precipitation.

Diversion Ditches
Ditches which will not be required after operations cease will be graded and contoured. The edges of the ditches will be rolled in and compacted. The contour or slope will match the surrounding area.

Roads
Roads which are to be reclaimed will be sloped and recontoured. These areas will then be ripped, and coversoil will be spread over the surfaces.

2.1.6.4 Coversoil Salvage and Replacement

Coversoil will be salvaged from all areas to be disturbed, except for portions of the pit already disturbed. The coversoil will be stockpiled in areas where wind and water erosion can be minimized. During operations, coversoil stockpiles around the plant may also provide visual and noise barriers. After operations cease, coversoil will be spread over the tailings impoundment, processing plant site, waste rock dumps, and roads constructed for the operation.

2.1.6.5 Cactus Salvage and Replacement

The Arizona Department of Agriculture and Horticulture protects certain cacti in Arizona. During the coversoil salvage operation, representative cacti will first be removed. The cacti will be transplanted to the coversoil stockpiles until mining operations cease. As the coversoil is spread over disturbed areas, the cacti will again be transplanted to the waste rock dumps and tailings impoundment.

2.1.6.6 Sediment Control

The diversion ditches, channels, retention ponds, and sediment traps will be left in place. The area will require several years to stabilize and regain erosion-reducing vegetation. Most of the diversion ditches should naturally revegetate, or they will be revegetated with native species during the operating life of the project. The ditches will be designed to have a gentle grade, which will minimize erosion in the ditch bottoms.

The sediment control ponds can be used for wildlife and cattle watering tanks, and should be beneficial to the area. The BLM will determine which structures should be maintained and which should be reclaimed prior to the closure of the project.

2.1.6.7 Groundwater Monitoring

NGMC has proposed to drill a groundwater monitoring well downgradient from the reclaim/recycle pond. This well will be in place prior to commencement of operations, and it will continue to be monitored after reclamation, until such time as the surety bond is released.

2.1.6.8 Reclamation Release Criteria

The reclamation bond shall be released when:

- A landform has been established to minimize wind and water erosion;
- Natural drainages have been reestablished;
- All safety hazards have been eliminated; and
- Native vegetation has been established on reclamation areas where applicable.

2.1.6.9 Surety Bond

The BLM surety bond amount has been calculated based on the reclamation plan presented in the proposed action. The surety bond estimate is presented in Appendix A.

2.2 Alternatives to the Proposed Action

Alternatives to the proposed action, or components of the project, which were considered include:

- No Action alternative; and
- Alternative tailings impoundment and processing plant.

Alternatives which were eliminated from consideration and from detailed analysis include:

- Underground mining;
- Backfilling the pit;
- Processing using a heap leach; and
- Waste rock disposal in Wash Draw.

Reasons for elimination of these alternatives are discussed in Section 2.2.3.

2.2.1 No Action Alternative

The No Action Alternative is required to be included in a discussion of alternatives by NEPA and the regulations enforcing it [40 CFR Part 1502.14(d)]. The No Action Alternative serves as the baseline for comparing and evaluating the environmental consequences of the proposed action and the various alternatives. The No Action Alternative would allow no further mineral development on the public lands in question.

The No Action Alternative conflicts with the General Mining Laws, the Federal Land Policy and Management Act (FLPMA) of 1976 and the regulations enforcing it (43 CFR 3800), and the Mining and Mineral Policy Act of 1970. In accordance with these laws and regulations, the claimant is granted rights to explore for, extract and process in a reasonable manner the mineral resource for which he holds claims. The BLM has the responsibility under FLPMA and under the regulations governing mining activities under the general mining laws on BLM-managed lands (43 CFR 3809) to ensure that:

- Appropriate state and federal laws such as the Endangered Species Act and the National Historic Preservation Act are complied with;

- Proposed operations do not cause unnecessary or undue degradation of federal lands; and

- Reclamation of disturbed areas is included in the proposed plan.

The BLM can disallow proposed mineral development activities only if they would violate applicable state and federal regulations and/or BLM standards. In such an instance, the BLM is then required to describe the changes in proposed activities needed to meet the requirements for development.

2.2.2 Alternative Tailings Impoundment and Processing Plant

An alternative tailings impoundment was evaluated in Section 16, T6N, R4W. Preliminary engineering and geotechnical studies were prepared to determine the impoundment size, height and configuration. The site in Section 16 has sufficient volume for the five million tons of tailings. (Figure 2-6, page 2-20)

Additional work was performed for groundwater hydrology, surface water diversion, surficial geology, and site characterization.

In order to utilize Section 16 for tailings, the processing plant site would be located to the north half of the northeast quarter of Section 21, T6N, R4W. The main haul road from the pit would be engineered to provide access to the new plant site.

2.2.3 Alternatives Eliminated from Consideration

This section discusses alternatives to the proposed action or portions of the project which were eliminated from further consideration and analysis in the environmental assessment. Eliminated alternatives include: underground mining; backfilling the pit; processing using a heap leach; and waste rock disposal in Wash Draw.

2.2.3.1 Underground Mining

The alternative of mining the deposit by underground methods has been eliminated from further consideration. The ore deposit outcrops on the surface and is a low grade deposit. In order to mine the deposit underground, a large portion of ore would be left on or near the surface to prevent subsidence. The structure of the rock is such that large underground excavations would likely collapse, making mining extremely unsafe. The overall project as evaluated for underground mining is economically and technically not feasible. A deposit of this type, because of its shape, surface exposure, and grade distribution, is only minable by the open pit method.

2.2.3.2 Backfilling the Pit

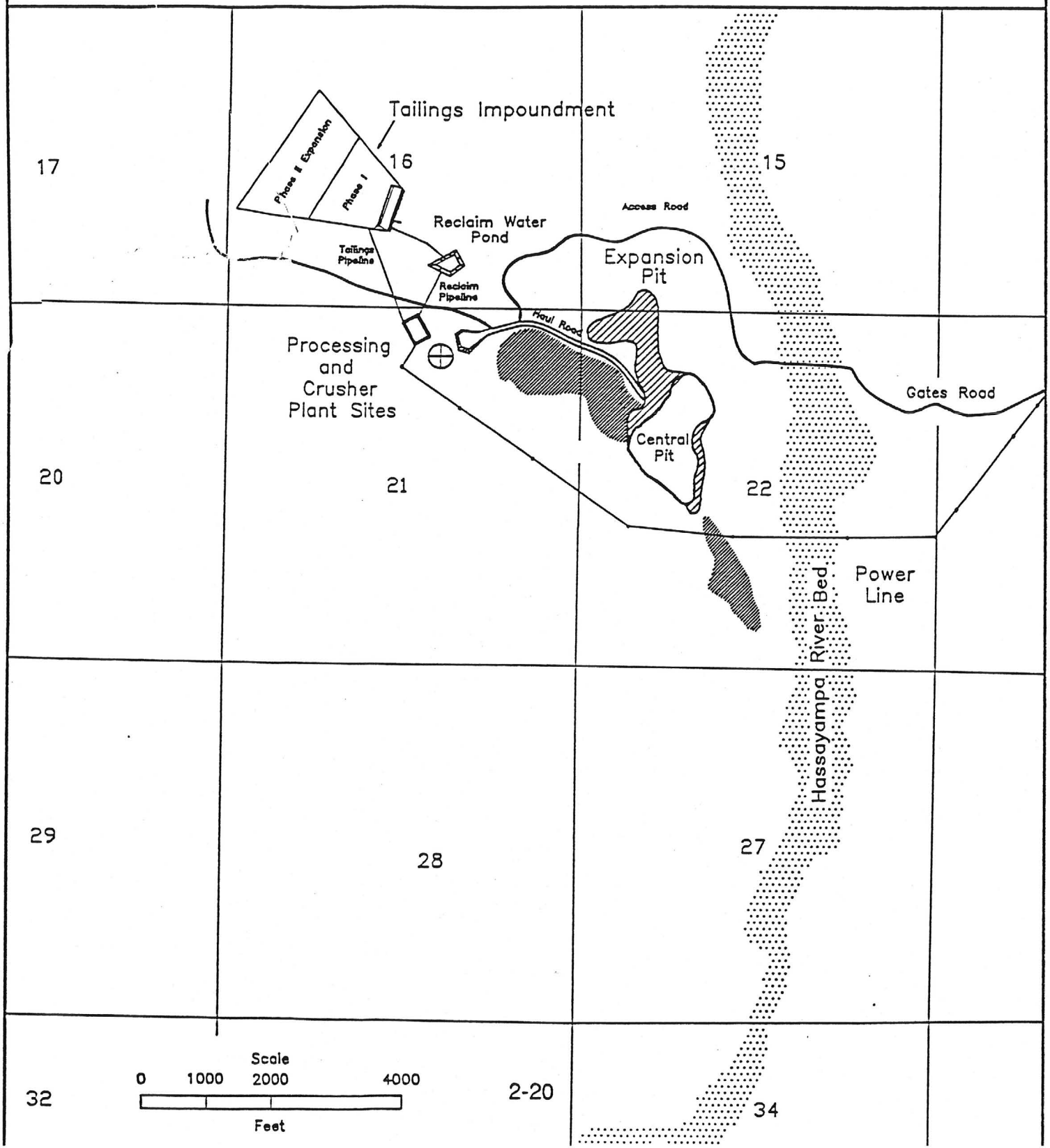
Backfilling of waste rock into the open pit during mine closure was evaluated and determined to be infeasible based upon economics and environmental issues. Approximately 10 million tons of waste rock would be removed from the pit. At an estimated cost of $1/ton, based on current loading and hauling costs, the cost of backfilling the pit with waste rock would be $10 million. Such increased project costs would raise the cutoff grade and render the project uneconomical.

Surface disturbance would be the same for backfilling as for the proposed action. Mine development precludes simultaneous backfilling of the open pit. After the waste rock would be replaced into the mine pit, the stockpile footprint would need to be reclaimed. Rehandling of waste rock to backfill the mine pit could result in:

Figure 2-6
ALTERNATIVE PLANT and TAILINGS SITES

Maricopa Co., Arizona, U.S.A.

Township 6 North, Range 4 West



- Increased water use for dust control;
- Lengthened project life and associated impacts to adjacent and off-site resources;
- Extended duration of particulate production; and/or
- Increased fuel use and associated emissions.

Backfilling of the pit was also eliminated from further consideration based on 43 CFR 3809.0-5(j), which states that reclamation may not be required where the retention of a stable highwall or other mine workings is needed to preserve evidence of mineralization for potential future development.

2.2.3.3 Processing Using a Heap Leach

The processing operation was evaluated using a heap leach recovery method. The heap leach has definite economic benefits over a mill, because of the lower capital costs to construct the heap leach. However, metallurgical tests indicate that the ore does not adequately release the gold in the heap leach process, making it economically inviable. The recovery would be less than 40%, compared with 90% to 95% in the mill. Therefore, the heap leach method was eliminated, due to unacceptably low recovery potential.

2.2.3.4 Waste Rock Disposal in Wash Draw

Disposal of waste rock in Wash Draw was eliminated from further consideration. Wash Draw is an east-west drainage in the project area; filling it would have a long-term impact on the drainage systems in the local area. The additional moisture in the drainage supports a shrub community typical of sonoran desert. Filling Wash Draw with waste rock would have increased impacts on visual aesthetics, surface drainage, and wildlife habitat. The Wash Draw alternative was also eliminated because it would block a major surface water drainage, and the surface water has been appropriated by other parties.

2.2.4 Comparison of Alternatives

In comparison to the proposed action, the alternative plant and tailings location would not substantially change the overall project. Generally, visibility would be greater from Highway 60, depth to groundwater would be shallower, and construction of the tailings impoundment would be more costly.

Comparative impacts to specific environmental resources are discussed in Chapter 4.

The intent of the "No Action" alternative is to illustrate the environmental consequences if the proposed or alternative actions do not occur, thereby providing a "benchmark" for comparison.

3.0 Affected Environment

Information summarized in this chapter was obtained from local, state and federal agencies; the applicant's documents; and Technical Reports (TRs) prepared by the applicant's consultants. Where appropriate, the TRs are referenced and attached as appendices to this Environmental Assessment. TRs were prepared to support baseline descriptions and impact analyses. The following reports are attached:

Appendix A	-	Surety Bond Estimate
Appendix B	-	Water Resource Associates' Hydrology Report
Appendix C	-	Water Resource Associates' Biological Assessment
Appendix D	-	Western Economic Analysis Center's Socioeconomic Report
Appendix E	-	Westech Laboratories' Metals Analysis

3.1 Air Resources

3.1.1 Climate

Arizona's climate is diverse due to changes in latitude, elevation, and surface conditions. The project area's climate reflects this diversity (Table 3-1). Temperature extremes in summer commonly reach 115°F and above, winters are mild, and freezing periods are infrequent and of short duration. Average annual temperatures are 65°F to 70°F. Approximately 11 inches of rain falls annually. Prevailing winds are from the east. Average wind speed is highest (7 mph) in the summer. Dry, dusty winds with gusts as high as 75 mph can occur during any season. [Arizona State Univ., 1981]

3.1.2 Air Quality

The Arizona Department of Environmental Quality (DEQ) was contacted to determine the air quality characteristics of the area. Since portions of Maricopa County are classified as "non-attainment" for Total Suspended Particulate (TSP), the air quality permit program has been delegated to the Bureau of Air Pollution Control, Maricopa County Health Department. "Non-attainment" for TSP means that the National Ambient Air Quality Standards for the amount of allowable particulate (dust) in the air has been exceeded.

The project area, although it is in Maricopa County, is outside of the non-attainment area associated with the Greater Phoenix area. New Source Performance Standards for precious metal milling operations allow for up to 100 tons per year of particulate.

A general dispersion calculation was performed for the proposed operations, and without any type of air pollution controls, the crushing plant would produce 58 tons per

year of particulate. Using a water spray to control dust (assuming 70% efficiency) would reduce the controlled emissions to approximately 18.0 tons per year of particulate.

Monitoring for any other pollutants has not been conducted in the general vicinity of the project. However, due to the lack of industrial sources in the area, it can be reasonably assumed that ambient concentrations of regulated pollutants are low.

Table 3-1
MEAN MONTHLY TEMPERATURES AND PRECIPITATION - WICKENBURG, AZ

MONTH	TEMPERATURE (^{0}F)	PRECIPITATION (inches)
January	47.5	1.09
February	51.0	1.06
March	54.9	1.36
April	62.5	.46
May	70.6	.22
June	80.4	.20
July	87.4	1.27
August	84.8	1.96
September	78.4	1.11
October	67.3	.62
November	55.3	.73
December	48.4	1.12
ANNUAL	65.7	11.20

NOTE: Data Period 1942 - 1980
SOURCE: Final Report - Arizona Climate Inventory - Volume 1, Laboratory of Climatology, Arizona State University, December 1981.

3.2 Geology and Mineral Resources

3.2.1 Regional Geology

The Newsboy Gold deposit is located in the central Basin and Range Province of Arizona. The province is dominated by the structurally complex northwest trending faults which were a major factor in the development of mineral deposits within central Arizona.

Newsboy is one of several gold deposits that occur within a broad mineral belt that sweeps across the southwest half of Arizona. The largest and most productive of the deposits in the immediate area of Newsboy are the Vulture Mine, Congress Mine and the Yarnell deposit.

The Vulture Gold Mine is one of Arizona's most famous and largest historical gold producers. Located approximately 10 miles west of Newsboy, the Vulture produced over 350,000 ounces of gold and 264,000 ounces of silver.

At Congress, approximately 15 miles north of Wickenburg, the historical Congress Mine had recently been re-opened at a production rate of 500 tons per day by Malarctic Hygrade. The Congress Mine has produced approximately 390,000 ounces of gold and 350,000 ounces of silver from shallow dipping structures cutting Precambrian granites.

The Yarnell deposit, another historical gold producer, has produced in excess of 10,000 ounces of gold. Yarnell has a drill-indicated insitu resource of approximately 8 million tons at a grade of 0.04 ounces per ton of gold.

3.2.2 Project Area Geology

Both historical and modern mining activities within the project area has focused on the gold and silver-bearing, low-angle, epithermal vein system which formed a more or less flat-lying, tabular ore horizon at the fault contact between volcanic and Precambrian rocks. High angle, normal faults down-dropped the ore body to the east in a steplike fashion. Ore-grade mineralization is also associated with these high-angle structures.

The lowermost geologic unit within the project is a Precambrian basement complex of steeply dipping, foliated metamorphic rocks consisting of green mafic schist and gneiss. Attitudes are nearly east-west and dip 40^0 to 70^0 to the north.

Overlying the Precambrian basement in low-angle fault contact is a structurally complex, faulted section of Tertiary volcanic rocks. The volcanic rocks form the low, rugged relief and elongated ridges of the project area. These Tertiary-age volcanic rocks consist of densely welded, thyolitic tuffs and flows, volcanoclastic units, and dark-colored mafic flows.

The major brecciated fault contact between the basement rocks and the overlying, brittle volcanic section is the locus of gold and silver-bearing epithermal mineralization. Gold deposition was accompanied by intense oxidizing hydrothermal activity which has altered the volcanic rocks to various assemblages of quartz, alunite, and kaolinite. Mineralization is restricted to the volcanic units as veins of white to light green banded quartz, very low in sulfide minerals. Black calcite veining is extensive throughout the deposit associated with the quartz mineralization; however, the calcite is a later phase and can be seen to cross-cut the very low-angle fault system.

Northwest-trending, high-angle faulting related to the Basin and Range tectonics has progressively down-dropped the ore body to the east. The most notable of these high-angle faults is the Wash fault. Erosion along this fault now exposes the ore body in a narrow wash which marks the western boundary of the ore body.

Historic mining activity in the immediate area of the deposit is concentrated along or near the high-angle structures, particularly the Wash fault. The Wash fault has extensive workings excavated along it, including shafts, adits and a small open pit, where approximately 11,000 tons was shipped as smelter flux, containing 0.07 ounces per ton of gold.

3.2.3 Mineral Resources

Over a four year period, between 1987 and 1990, a total of 114 test holes totaling 25,251 feet of drilling were completed on the Newsboy property. With the exception of the 1990 metallurgical core program, all holes were reverse circulation. These holes were drilled to intersect the more or less flat-lying, brecciated fault contact between the Tertiary volcanics and the underlying Precambrian basement.

The Newsboy deposit contains a measured and inferred resource of 5.8 million tons of 0.04 ounces per ton of gold and 0.7 ounces per ton of silver.

Prior to conducting ore reserve calculations, a thorough verification of the data base was performed. All assay entries were checked against the original assay sheets to insure that gold and silver assays were correctly entered. In addition, all collar elevations and survey coordinates were checked against the survey data, together with field checks by a licensed surveyor.

3.3 Water Resources

Groundwater resource information has been obtained from the State of Arizona, Department of Water Resources Report - Groundwater Conditions in the Hassayampa Sub-Basin of the Phoenix Active Management Area, by M.R. Long, June 1983. Additional information was obtained from Sanger and Appel, 1980; the U.S. Bureau of Reclamation, 1977; and Water Resource Associates, 1992.

3.3.1 Regional Groundwater Conditions

The Hassayampa sub-basin of the Phoenix Active Management Area, located about 50 miles west of Phoenix, includes approximately 1,200 square miles in west-central Arizona. The sub-basin includes the Hassayampa Plain of the Hassayampa River as described by Sanger and Appel, 1980. The sub-basin is an alluvial plain bounded on the north by the Vulture and Wickenburg Mountains, on the east by the White Tank Mountains, on the south by the Buckeye Hills and Gila Bend Mountains, and on the west by the Belmont and Big Horn Mountains and the Palo Verde Hills.

The Hassayampa sub-basin is drained by the Hassayampa River, Jackrabbit Wash, and Centennial Wash. The Hassayampa River enters the sub-basin from the north and continues about 40 miles south to its confluence with the Gila River east of Arlington. Jackrabbit Wash originates in the area on the west, north of the Belmont Mountains, and continues southeast across the Hassayampa Plain to its confluence with the Hassayampa River. Centennial Wash enters the southwest portion of the lower Hassayampa area through Mullens Cut, and continues southeast to the Gila River. All three streams are ephemeral, flowing only after heavy rains.

Because of the ephemeral nature of the streams, the only dependable source of water for most of the sub-basin is groundwater. A small amount of surface water is delivered to the Arlington Valley by the Arlington Canal Company via 22 miles of unlined canal system that runs from near the confluence of the Hassayampa and Gila Rivers south and west to a point immediately north of Gillespie Dam. The surface water delivered to the area is flood water and agricultural irrigation tailwater from the Buckeye area and is used to supplement the groundwater supply in Arlington Valley. The amount of surface water available varies yearly, and delivery records do not exist. However, it is estimated that less than 5,400 acre-feet of surface water is delivered yearly [University of Arizona, 1978, p.149].

In the Hassayampa Plain, groundwater is used primarily for livestock watering and domestic supply. In 1982, no land was irrigated in this area, and total pumpage was estimated to be less than 500 acre-feet.

Groundwater in the Hassayampa Plain occurs predominantly in the basin-fill sediments, locally in thin alluvium in stream channels that drain the mountains surrounding the area, and in the fractured and weathered volcanic, granitic, metamorphic and sedimentary rocks that comprise the mountains. The main water-bearing unit in the area consists of the basin-fill sediments. These deposits are comprised of gravel, sand, silt, and clay [Sanger and Appel, 1980], and range from a few tens of feet thick near the mountains, to more than 800 feet thick near the center of the Hassayampa Plain. Groundwater in the basin-fill sediments occurs under unconfined, or water-table conditions. In the spring of 1982, the depth to water in the basin-fill sediments ranged from 77 feet below land surface near Jackrabbit Wash in the northwestern part of the plain, to 659 feet below land surface in the north-

central part. The sediments will yield a few tens to several hundreds of gallons per minute of water to properly constructed wells [Sanger and Appel, 1980].

The chemical quality of groundwater in the Hassayampa Plain is generally suitable for most uses. Specific conductance values for water samples collected from wells in the area range from 200 to 2450 microhms per centimeter at 25°C, and dissolved-solids concentrations estimated from the specific conductance values ranged from 120 to 1470 milligrams per liter (mg/L). Two of the 22 samples analyzed exceeded the maximum contaminant level for dissolved solids. [Long, 1983]

Fluoride concentrations in the groundwater samples collected in the Hassayampa Plain area ranged from 0.2 to 3.0 mg/L. Seven of the 22 samples analyzed exceeded the maximum acceptable fluoride concentration of 1.4 mg/L.

3.3.2 Project Area Groundwater Conditions

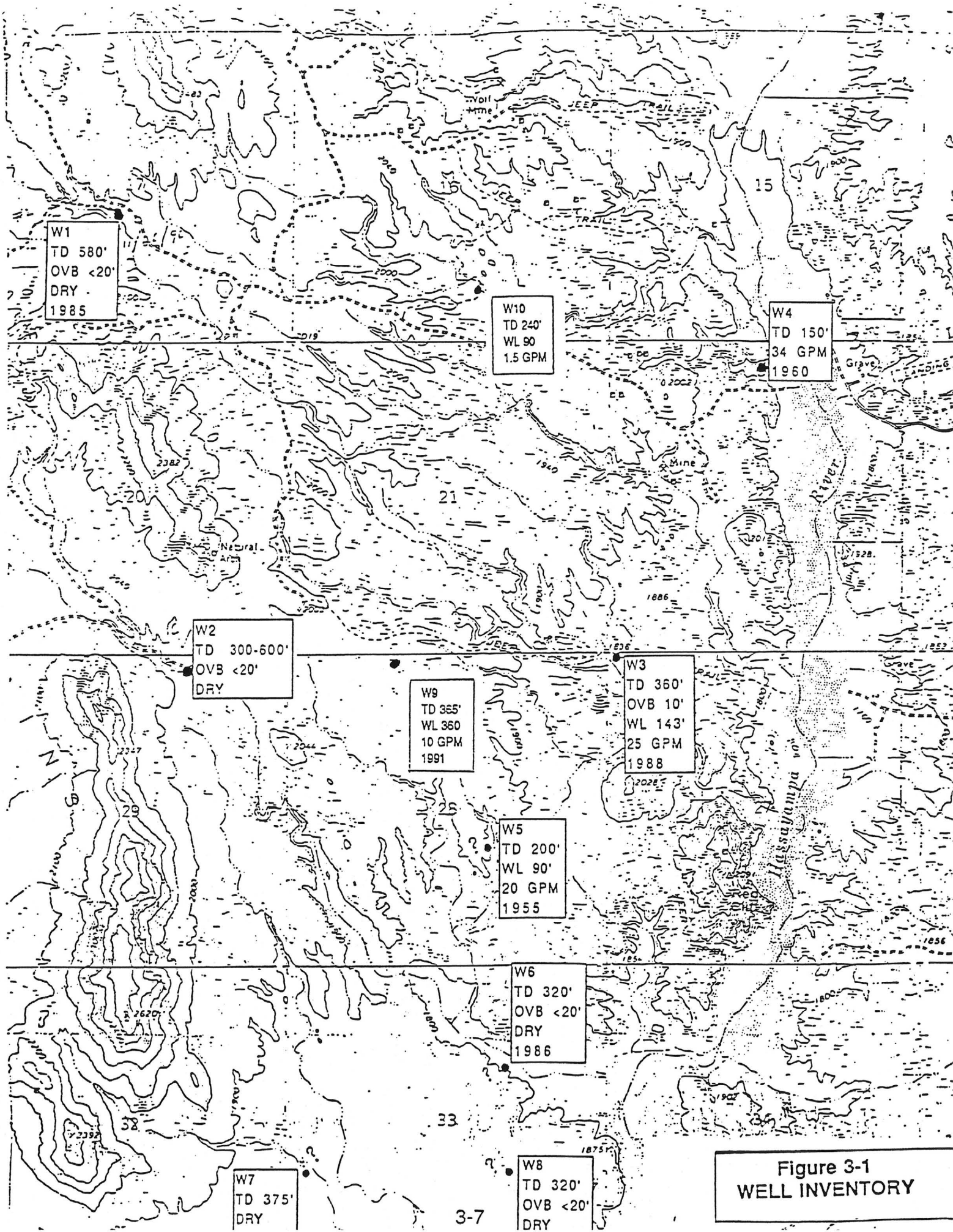
Information on groundwater in the project area has been developed from data generated by drilling activities and hydrogeological studies conducted by Water Resource Associates. Additional data has been obtained from the Arizona Department of Water Resources, U.S. Geological Survey, U.S. Bureau of Reclamation, U.S. Corps of Engineers, and the University of Arizona.

Water Resource Associates supervised the completion of a drill hole, RDH 28-1, in the tailings impoundment area [Appendix B]. This hole was drilled to determine what lithologies were present, vadose properties, and the depth to saturation. In summary, the drill hole RDH 28-1 was completed to a depth of 365 feet and encountered two (2) principal rock types: Quaternary alluvium composed of sand and gravels, from 0 to 160 feet; and Tertiary volcanic and volcanoclastic rocks, from 160 to 360 feet. Precambrian schists were intersected from 360 to 365 feet. Groundwater was first encountered at a depth of 360 feet, or an elevation of 1600 feet AMSL. [WRA, 1992]

Studies conducted by Sanger and Appel (1980) and U.S. Bureau of Reclamation specialists (1977) concluded that the basement complex is of little significance as a source of groundwater. These workers concluded that bedrock bounds most alluvial basins and is an effective barrier to groundwater movement between alluvial basins. In areas where bedrock is highly fractured, it can be a groundwater reservoir. Water wells in these formations generally yield ten gallons or less per minute in the project area.

Water well data in the immediate project area has been compiled from records of the Arizona Department of Water Resources. The locations of the individual wells, along with pertinent data, are shown in Figure 3-1 (page 3-7).

Water quality data and groundwater depths have been collected from Sanger and Appel (1980). This data suggests that water quality in the general project area is within secondary drinking water standards. Major elevations range from 1,936 above


W1
TD 580'
OVB <20'
DRY
1985
W10
TD 240'
WL 90
1.5 GPM
W4
TD 150'
34 GPM
1960
W2
TD 300-600'
OVB <20'
DRY
W9
TD 365'
WL 360
10 GPM
1991
W3
TD 360'
OVB 10'
WL 143'
25 GPM
1988
W5
TD 200'
WL 90'
20 GPM
1955
W6
TD 320'
OVB <20'
DRY
1986
W7
TD 375'
DRY
W8
TD 320'
OVB <20'
DRY
Figure 3-1
WELL INVENTORY

sea level in the extreme northern portion of T6N, R4W, down to 1,366 feet above sea level in the southern portion of T6N, R4W, respectively.

3.3.3 Regional Surface Water

The Hassayampa River is the major surface water source flowing north to south through the region. The Hassayampa has surface flow to approximately 3 miles upstream of the project area. Adjacent to the project, the Hassayampa is ephemeral, with the majority of the flow being subterranean.

3.3.4 Project Area Surface Water

The Newsboy site is on alluvial slopes of the east face of the Vulture Mountains. Numerous large draws originate in the higher elevations of the Vultures, drain to the east and south across the alluvial fans, and empty into the Hassayampa. There are two large, unnamed drainages located 1 mile and 1½ miles north of the mine. Both drain from the west to the east.

The drainage which separates the mine from the processing plant is Wash Draw. The size of the drainage area for Wash Draw is approximately 2 square miles.

The next drainage (unnamed) to the south separates the plant site from the tailings impoundment. The size of this drainage area is approximately 1 square mile.

The unnamed drainage area south of the tailings impoundment is the largest drainage in the area. This drainage is several square miles in size, and none of the proposed project activities will cross this drainage.

All of the drainages are ephemeral, and runoff is associated with major thunderstorm events. No seeps or springs were identified in the project area which would contribute to year-round flow.

3.4 Soils

The project area has eight different types of soils, as described by the Soil Conservation Service in the Soil Survey of Aguila-Carefree Area, Parts of Maricopa and Pinal Counties, Arizona, 1986. These eight soils are listed below.

UNIT #	UNIT NAME	SLOPE	DESCRIPTION
13	Carefree - Beardsley	0-3%	cobbly clay - cobbly clay loam
32	Dixaleta - Rock Outcrop	25-65%	sandy loam - rock outcrop
43	Eba-Pinaleno	20-40%	very gravelly loam - very gravelly clay loam
52	Gachado - Lomitas - Rock Outcrop	7-55%	very gravelly loam - very gravelly sandy loam - rock outcrop
64	Gran - Wickenburg - Rock Outcrop	10-65%	very gravelly sandy loam - gravelly sandy loam - rock outcrop
70	Gunsight - Rillito	1-25%	very gravelly loam - gravelly loam
74	Luke - Cipriano	1-8%	very gravelly sandy clay loam- very gravelly loam
94	Nickel - Cave	8-30%	gravelly sandy loam - gravelly loam

3.5 Vegetation

The project site is located in the Arizona upland region of the Sonoran desert and has two major ecological subdivisions — Upland Sonoran Desert Unit and Hassayampa Riparian Edge. [WRA, 1992]

3.5.1 Upland Sonoran Desert Unit

The Upland Sonoran Desert Unit consists of sparsely vegetated areas which are devoid of standing water. It encompasses most of the project study area. Vegetation in the Upland Sonoran Desert is noted for its uniformity and relative similarity throughout its range [Shreve and Wiggins, 1964]. The vegetation type found in this area, as well as all Arizona Upland Sonoran Desert, is typified by the saguaro cactus (Cereus giganteus) [Jaeger, 1957; Brown and Lowe, 1973].

Dominant vegetation types found on the project study area include:

- Catclaw acacia (Acacia gregg)
- Creosote bush (Larrea tridentata)
- Jojoba (Simmondsia chinesis)
- Bursage (Ambrosia dumosa), and
- Cholla (Opuntia sp.)

A list of the flora found in this area is presented in Appendix C. The species found on this area agree, in general, with those described by Jaeger (1964), Lowe and Brown (1973), and Brown (1982), as typical of this Division.

3.5.2 Hassayampa Riparian Edge

The second major ecological area occupied by this site occurs on the far eastern edge of the area. It consists of a very narrow band at the western edge of the Hassayampa River. This area encompasses less than 10% of the study area, and is well removed from the proposed mining activity.

Vegetation unique to this riparian edge include:

- Mesquite (Prosopis juliflora)
- Four-wing saltbush (Atriplex canescens)
- Crucifixion thorn (Holacantha enmoryi)
- Datura (Datura sp.)
- Devil's claw (Proboscidia sp.)
- Desert broom (Baccaris sarothroides)
- Seep willow (Baccaris ghetinos), and
- Burrow brush (Hymenoclea salsola)

All of the above-listed flora is typical of those species found in riparian "dry" drainages in the Sonoran Desert Division [Brown, 1982; Lowe, 1967]. A complete list of the flora found in this area is presented in Appendix C.

3.5.3 Threatened and Endangered Plants

A literature review was conducted to determine the potential presence of threatened and/or endangered plant species in the general area. The U.S. Fish and Wildlife Service was also contacted. No threatened and/or endangered plants were identified. A Category 2 species, the Hohokam agave, was identified as possibly occurring in the vicinity of the subject property [U.S. Fish and Wildlife Service, 1992].

The project study area (of approximately 1,000 acres) was surveyed for threatened and endangered plants, and category species, to determine if any were present. No threatened and/or endangered plants, or category plants, were observed.

3.5.4 State Protected Plants

The Arizona Native Plant Law (ARS Chapter 7) effective 9/21/91 defines and lists protected groups of plants in five categories:

1. Highly Safeguarded native plants are those whose prospects of survival are in jeopardy and are afforded exclusive protection.

2. Salvage Restricted native plants are those species not in jeopardy but subject to a high potential for damage by theft or vandalism.

3. Export Restricted native plants include those species not included as highly safeguarded, but which would be subject to depletion if their export from the state were permitted.

4. Salvage Assessed native plants include species not included in the above categories, but which have sufficient value if salvaged to support the cost of tags and seals.

5. Harvest Restricted native plants are those not in the safeguarded category, but which are subject to excessive harvesting or overcutting.

Plant species listed in the Arizona Native Plant Law which are known to occur on proposed disturbance sites must be salvaged. This activity will be coordinated with the BLM and the Arizona Department of Agriculture and Horticulture.

3.5.5 Wetlands

The study area is characterized by numerous dry washes, draining east and south to the Hassayampa River. There are no wetlands on the project site.

3.6 Wildlife

General wildlife surveys were performed on the project area from August through November, 1991 and April-May, 1992 by Water Resource Associates (WRA). The WRA Biological Report is presented in Appendix C.

3.6.1 Wildlife Species

Wildlife present on the project area are typical of the site's acreage and habitat types present on the east slope of the Vulture Mountains. The local wildlife community has been adversely and beneficially impacted by past mining activities. Adverse impacts include habitat losses to roads and other mine-related facilities, totaling 15 acres. Recreationist use of the roads through the area probably results in minor, short-term,

seasonal displacement of some wildlife species, such as mule deer. Beneficial effects of mining include limited bat use of tunnels (and possibly shafts), and lizard use of microhabitats under mine facility debris (boards, barrels, etc.). Many of the wildlife species inhabiting the project area and surrounding habitats are nocturnal.

The Side-blotched lizard and Western whiptail were common, and represented the most conspicuous reptiles on-site, associated with all plant communities. Snakes observed in the project study area include the Kingsnake, Black-tailed rattlesnake, and the Arizona Black rattlesnake. Other rattlesnakes are likely to be present.

The lack of any permanent water restricts amphibian presence. There are no fish or fish habitats present on-site or downstream on the Hassayampa.

Local avifauna abundance on-site is characteristic of the site's two habitats present. Trees within the Upland Sonoran Desert Unit provide a structural diversity supporting such species as bushtit, mourning dove, curve-billed thrasher, common flicker, Gila woodpecker, phainopepla, verdin, black and Say's phoebe.

Species with larger home ranges overlapping both plant communities include the common raven, American kestrel, red-tailed hawk, common nighthawk, turkey vulture, and horned owl. Surveys of cliffs and large outcrops in and adjacent to the project area did not locate any raptor nests. The project area is not located within a major waterfowl flyway, and there is no waterfowl or shorebird use of the project area.

A variety of bats probably hunt on the project area and may seasonally roost in natural rock outcrops and the historic mine workings. All adits examined contained some evidence of present or former bat use.

Mammals in the area include javelina, mule deer, coyote, jackrabbit, desert cottontail, kangaroo rat, Arizona pocket mouse, rock pocket mouse, and antelope squirrels.

3.6.2 Threatened and Endangered Species

No threatened or endangered species as listed by Arizona Game and Fish Department (AG&FD) (Guideline by U.S. Fish and Wildlife Service) were encountered on the proposed site [AG&FD, 1988; Rick Gerhard, Pers. Comm., 1991]. The site would not be classified as "Critical Habitat" as defined by the U.S. Fish and Wildlife Service [USFWS, 1990]. No threatened or endangered plant species were found. [WRA, 1992]

Approximately 1,000 acres, including the mine site, were part of the biological study. The emphasis during this entire study focused on the location of threatened and endangered species. As discussed, there was no evidence of either. Literature review collaborated these findings of no known previous record of threatened or endangered plant or animal species in this area. This area is not unique to the Arizona Upland Division of the Sonoran Desert.

3.6.3 Candidate Species for Threatened and Endangered Species Status

Desert Tortoise

The Sonoran Desert Tortoise (Gopherus agassizi) was sighted and scat was found in two separate areas in the study area. The first was in the SE¼ of Section 15, and the second was in the SW¼ of Section 21. Both sitings were outside the areas of proposed surface disturbance.

In July 1991, the U.S. Fish and Wildlife Service determined that the Sonoran Desert Tortoise would not be classified as a threatened or endangered species [Rick Gerhard: Pers. Comm]. However, due to the limited nature of the populations and habitats, the Sonoran Desert Tortoise is particularly vulnerable to human activities [Sprague, et al., 1988]. BLM has drafted a "Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona" [BLM, 1990]. This management document allows for mining and mineral processing activities in close proximity to Desert Tortoise habitats if proper mitigation procedures are implemented.

The Sonoran Desert Tortoise habitat in the general vicinity of the study area is classified as interim Category II - "Land Compensation." A more detailed discussion of mitigation is presented in Section 4.6.4 of this document.

Chuckwalla

Chuckwalla (Sauromalus obesus) has been recently added to the Candidate species list. Literature search indicates the possibility of its occurrence within the study area, but no field observations have been made by any field workers. Chuckwallas usually occur in areas where there are large boulders or other rocky outcrops. This type of habitat allows them to maneuver into crevices as a defense mechanism [Stebbins, 1985]. The study area has no boulder area and only limited rocky outcrops. It is unlikely that they occur within the study area. [WRA, 1992]

Yavapai Arizona Pocket Mouse

Two general areas were sampled using small mammal traps -- the mine site in Section 22, and a control area in Section 21, which will not be disturbed as part of the proposed mining operations. Trapping resulted in the capture of six Yavapai Arizona Pocket Mice (Perognathus amplus amplus). This quantity constituted 35 percent of the mammals captured. This pocket mouse, including its various subspecies, seems to have a distribution across the site, as well as common distributions in portions of the Sonoran Desert.

3.7 Land Use Considerations

3.7.1 Land Use and Land Use Plans

Present land use of the project site includes mineral exploration, grazing, and wildlife habitat. The land use of the surrounding area also includes recreation and grazing.

The most recent land use plan developed for this area by the BLM is the Lower Gila North Management Framework Plan (MFP) - March, 1983. This MFP provides management guidance for those areas in Lower Gila covered by the plan.

3.7.2 Recreation

Public lands provide the setting for a wide variety of recreation opportunities in the Wickenburg area. Though most opportunities are for dispersed activities, developed recreation sites are also present. The major recreation area near the project site is Lake Pleasant.

Recreation activities on the project area currently include hunting, target shooting, hiking, horseback riding, rock hounding, and off-highway vehicle driving, but these are limited by available resources.

3.7.3 Wilderness and Congressional Designation

The Arizona Desert Wilderness Act was signed in November, 1990. None of Arizona's wilderness areas will be affected by the project. The nearest wilderness area, Hassayampa River Canyon, is approximately 16 miles from the project area.

3.7.4 Grazing

Two grazing allotments currently overlap the project area.

3.7.5 Wild Burros

There are limited numbers of wild burros near the project area.

3.7.6 Areas of Critical Environmental Concern (ACECs)

There are no ACECs within 35 miles of the project area.

3.8 Cultural Resources

3.8.1 Survey

A BLM Class III Cultural Resource Survey was conducted by WRA Engineering and Testing Laboratories, and Louis Berger and Associates, Inc. The survey was submitted to the BLM for review on April 10, 1992. The survey covers approximately 1,000 acres in Sections 15, 16, 17, 20, 21, 22, 27, 28 and 29, T6N, R4W, which encompasses the proposed project disturbance of 260 acres.

WRA consulted with the BLM and reviewed files for existing information before commencing the on-site surveys. The WRA survey identified two prehistoric sites and 16 historic sites within the 1,000 acres. No paleontological deposits nor culturally sensitive areas were discovered within the proposed project area. Two of the largest historic sites are directly related to major historic mining activities; the old stamp mill site of Seymour III, and the historic pumping plant known as Seymour Station.

3.8.2 Recommendations

The final mitigation plan will be approved by the BLM and the Arizona State Historic Preservation Officer before any of the sites can be disturbed.

3.9 Aesthetics

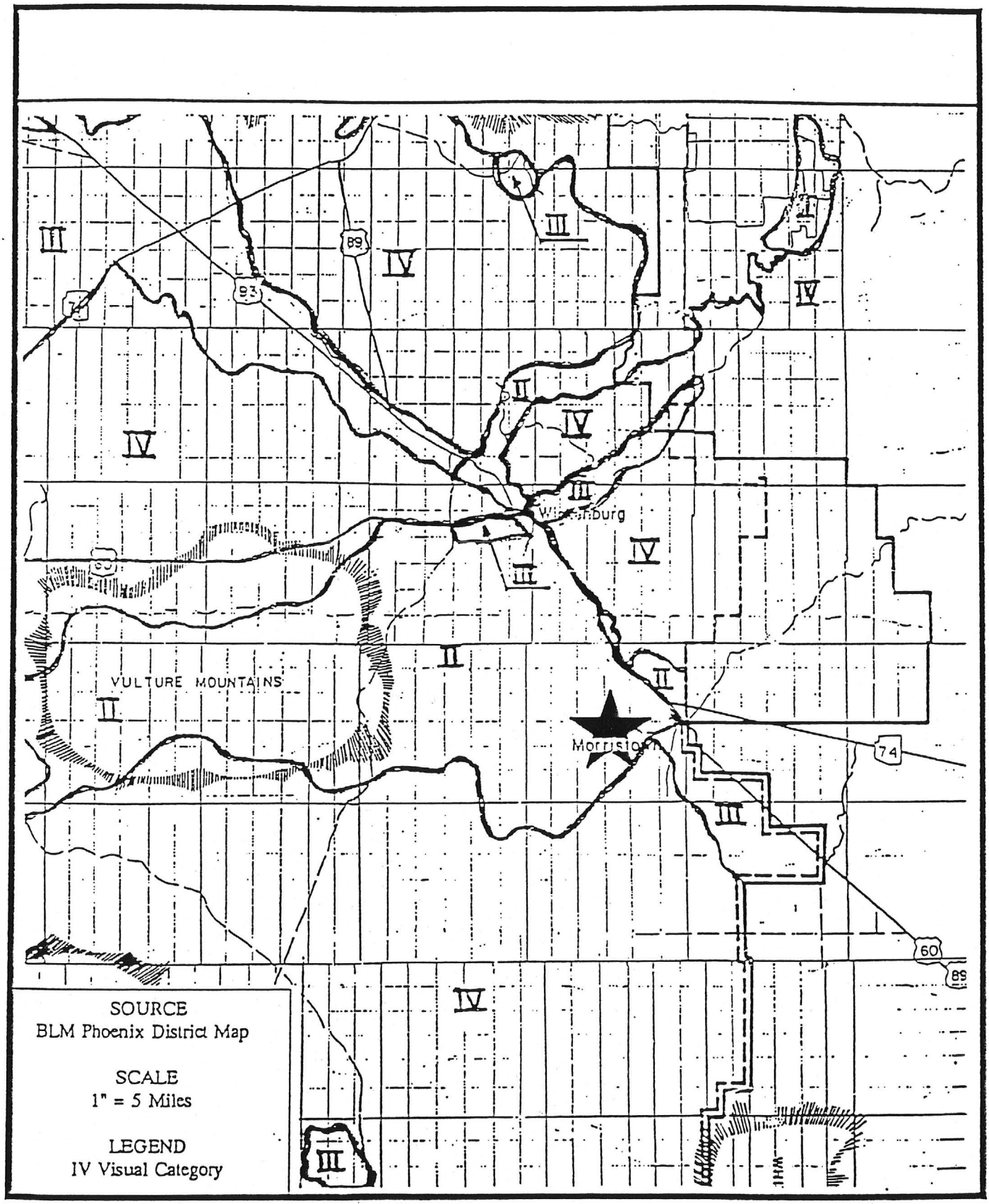
3.9.1 Visual Resource

The visual resources occurring in the area have been defined by the BLM using guidelines in the Visual Resource Inventory Manual (BLM Manual Handbook 8410-1, 1986) under the BLM's Visual Resource Management (VRM) system. Based on the visual inventory, lands were placed into different visual resource inventory classes, each representing the relative value of the visual resources, and different management objectives. (Figure 3-2, page 3-16)

The study area is located in the Sonoran Desert section of the Basin and Range physiographic province. The landscape consists of small mountain ranges separated by broken and rolling desert plains. The Hassayampa provides visual interest with additional topography and a variety of vegetation. Seasonally distinctive features occur during times of water flow.

The study area is identified as VRM Class II Landscape. Visual sensitivity is high, primarily due to the Wickenburg Highway Scenic Corridor Plan (U.S. Highway 93). The visual distance zone is foreground-middleground. Distinctive features of the landscape, including the Hassayampa and the Vulture Mountains, provide "A" and "B" scenic quality levels. The existing visual condition of the project area is moderately

Figure 3-2
VISUAL RESOURCE
INVENTORY



disturbed with a network of roads, drill pads, and other ground disturbances scattered throughout the site.

3.9.2 Noise

A description of the environment potentially affected by noise emissions from the proposed project includes:

- identification of noise-sensitive receptors and existing noise sources in the vicinity;
- characterization of terrain features which may affect noise transmission; and
- determination of existing noise levels.

The proposed Newsboy project is located on the west side of the Hassayampa River in a remote, relatively unpopulated area. Four residences are located within ¾ mile of the mine and processing plant, representing the closest, sensitive receptors. Principal sources of continuous noise in the area will be the mining operation, and to a lesser extent, the processing operation. Blasting will be on a once-per-day schedule between the hours of 8 am and 5 pm.

The existing noise sources are traffic on the highways, the Atchison, Topeka and Santa Fe Railroad, and to a lesser extent, wind, insects and birds. Additional but less frequent noise results from jet fly-overs from Luke Air Force Base.

Terrain in the project area is complex and will act as a shield for noise from mining activities. The four closest residences will be shielded by a hill in the foreground from most of the mining and processing noise. There may also be locations where noise is focused and intensified by terrain. Vehicular traffic on the access road may create more noise during shift changes than occurs during the ongoing operation.

Based on EPA literature, site visits, and previous experience with mining projects in remote areas, it is estimated that current, existing noise levels range from 40 to 65 decibels, A-weighted (dBA) in most of the project area, except in close proximity to high activity areas. Decibels are weighted to achieve close approximation to the human hearing spectrum. The lower end of the range (40 dBA) represents noise levels one would experience in a small, rural community. Quieter parts of the project area would be at or below this level much of the night time. The upper end of the range (65 dBA) represents background noise levels during normal daytime activities.

Table 3-2 - Relative Scale of Various Noise Sources and Effect on People, provides relative information on typical noise levels and the point at which most people are affected by increased noise.

Table 3-2
RELATIVE SCALE OF VARIOUS NOISE SOURCES AND EFFECT ON PEOPLE

PUBLIC REACTION	RELATIVE LOUDNESS	Noise Level (dBA)	COMMON INDOOR NOISE LEVELS	COMMON OUTDOOR NOISE LEVELS
		110	Rock Band	Jet Flyover at 1,000 feet
Local Committee Activity with Influential or Legal Action		100	Inside Subway Train (New York)	Gasoline Lawn Mower at 3 feet
Letters of Protest	4 times as loud	90	Food Blender at 3 feet	Diesel Truck at 50 feet
Complaints Likely	Twice as loud	80	Garbage Disposal at 3 feet. Shouting at 3 feet	Noisy Urban Daytime
Complaints Possible	Reference	70	Vacuum Cleaner at 10 feet	Gasoline Lawn Mower at 100 feet
		65	Normal Speech at 3 feet	Commercial Area; Heavy Traffic at 300'
Complaints Rare	½ as loud	60	Large Business Office	
Acceptance	¼ as loud	50	Dishwasher Next Room	Quiet Urban Daytime
		40	Small Theatre, Large Conference Room (Background) Library	Quiet Urban Nighttime
		30	Bedroom at night; Concert Hall (Background)	Quiet Rural Nighttime
		20	Broadcast and Recording Studio	
		10	Threshold of Hearing	
		0		

3.10 Socioeconomics

Socioeconomics information has been obtained from The Socioeconomic Impact of the Newsboy Gold Mine, Morristown, Arizona, prepared by George F. Leaming, Ph.D., Western Economic Analysis Center (WEAC), 1992. The complete report can be reviewed in Appendix D.

3.10.1 Existing Socioeconomic Environment

The local economy of the Wickenburg-Morristown area is based largely on seasonal (winter) tourism, retirement, and livestock raising. The locale had a population of about 5,000 in 1990 and has been growing steadily for the past two decades. Unemployment in the Wickenburg labor market in 1991 averaged only 2.6% of the labor force, with the total number of persons employed (including seasonal farm workers and those who are self-employed) at about 1,565. The Wickenburg economic area, defined as the area within the Wickenburg and Morristown school districts, has a generally well developed public and private infrastructure with a modest amount of unused capacity in most sectors and a demonstrated ability to add moderate amounts of capacity when required to do so by area growth. The local economy is heavily influenced by the proximity of the much larger Greater Phoenix economy.

3.11 Transportation

Existing major transportation corridors are available near the project area. State Highway 93 is about 3 miles east of the project. The Atchison, Topeka and Santa Fe Railroad is approximately 2½ miles east of the project area.

Major transportation access is also available from U.S. Interstate 17 via Arizona Highway 74 to the intersection with Arizona Highway 93, just north of Morristown.

The Draft - Wickenburg Highway Scenic Corridor Plan, January 1991, outlines goals to protect the scenic quality of Arizona Highway 93 between Wickenburg and Phoenix. The project area is west of the proposed corridor.

4.0 Environmental Consequences

The environmental consequences of the proposed action and reasonable alternatives will be discussed by resource, using the following assumptions:

1. The proposed action and/or alternatives will be fully funded and staffed;
2. Existing federal, state and local environmental standards are adequate for protection of the environment;
3. Short-term impacts are 5 years or less, and long term impacts involve more than 5 years;
4. Impacts will be direct, unless otherwise stated;
5. Mitigation measures will be real, committed, and enforceable;
6. The time frame for the project is 5 years; and
7. Adverse or beneficial impacts which are identified as "low" and "medium" are not considered significant impacts. "High" impacts are considered as significant impacts.

After each resource is discussed, impacts and mitigation are specifically addressed. Cumulative impacts and potential, significant adverse impacts are also considered.

4.1 Air Resources

4.1.1 Proposed Action

Impacts to air quality would be localized and short-term. Drilling, blasting, loading and hauling would continue through the life of the project and would be fairly constant for the movement of ore and waste rock. The majority of the Total Suspended Particulate (TSP) emissions would be from ore handling and vehicular travel on unpaved roads.

The crushing plant would be the major stationary source for TSP emissions. The grinding circuits in the processing plant will be wet, and will therefore not be a source of particulate emissions.

Portions of Maricopa County around the greater Phoenix area are listed as "non-attainment" for TSP and PM-10. However, the project site is located in an area of the county which is considered "attainment" for TSP and PM-10 [Bureau of Air Pollution Control, Maricopa County Health Department]. Attainment areas allow for additional development when the proposed source will emit less than 100 tons per year of particulate. The estimated emissions from the crushing plant are approximately 18 tons per year.

As outlined in Section 2, the applicant has proposed the use of water spray and/or bag-houses on the crushing plant to control dust. Additionally, chemical dust suppression and/or water will be used on the haul roads and access road to minimize fugitive dust.

The tailings impoundment has the potential to be a source of fugitive dust. The applicant will evaluate the tailings' depositional character to determine if dust is a problem. If the tailings maintain moisture, dust should not be a problem.

A representative from the Bureau of Air Pollution Control of the Maricopa County Health Department stated that an air quality permit would be issued for a project of this size. Projects which are expected to emit less than 100 tons/year of PM-10 particulate can obtain a permit without the extensive New Source Review.

4.1.2 No Action Alternative

Under the No Action alternative, the project would not be operated. There would be no additional dust introduced to the environment from the proposed operation.

4.1.3 Alternative Plant and Tailings Location

The alternative plant location is in the north half of the northeast quarter of Section 21. The alternative tailings impoundment would be in the west half of Section 16. The potential to emit dust would be the same as the proposed action.

4.1.4 Mitigation

The applicant has proposed a mitigation program for dust from the crusher and fugitive dust from the mining operation. An additional mitigation program will be developed for the tailings impoundment if fugitive dust is a problem. The mitigation program would include water spray, chemical suppression, or rock cover. At this time, it is not known if dust from the tailings will be a problem.

4.1.5 Impacts

A total of 260 acres will be impacted by surface disturbance activities. These disturbed areas will be a source of fugitive dust. Particulate will also be generated by the blasting, hauling, and crushing operations. The mitigation program will include water sprays, filters, and/or baghouses to minimize dust. The haul roads and access road will be treated with a chemical dust suppressant approved by the BLM. Water spray may be used in conjunction with the chemical. The dust suppression chemicals being considered are magnesium chloride, calcium chloride, and lignosite.

The Bureau of Air Pollution Control of the Maricopa County Health Department will issue an Air Quality Permit if the applicant can demonstrate that the air emissions from the project will meet air quality standards.

No cumulative or significant adverse impacts have been identified for the air quality resource. Impacts will be medium and short term.

4.2 Geology and Mineral Resources

4.2.1 Proposed Action

The proposed action will remove approximately 15 million tons of material (5 million tons of ore and 10 million tons of waste rock). The ore will be processed and pumped, as tailings, to the permanent impoundment. Approximately 27,000 ounces of gold will be removed each year, for a total of 135,000 ounces of gold over the five year life.

Waste rock will be left in the three permanent dumps. The open pit will be left in a stable condition, but the pit will not be backfilled.

4.2.2 No Action Alternative

Under the no action alternative, the ore deposit would not be mined, and gold would not be recovered.

4.2.3 Alternative Plant and Tailings Location

The alternative plant and tailings location would not affect the geology or mineral resources.

4.2.4 Mitigation

No mitigation is stipulated for geology and mineral resources.

4.2.5 Impacts

Approximately 10 million tons of waste rock will be removed from the pit and placed in three waste rock dumps. A potential of 5 million tons of ore could be removed, processed, and placed in the tailings impoundment. The final pit will be about 58 acres in size, with a highwall on the east side, and haul road access from the west.

The pit will not be backfilled, thereby leaving the mineralized exposure for potential future development. The highwall side of the pit will be fenced and posted.

No cumulative or significant adverse impacts have been identified.

4.3 Water Resources

4.3.1 Surface Water

There are no perennial streams on or near the project area. The drainages which traverse the project area are ephemeral, and only flow during major precipitation events.

The Hassayampa River, which is approximately 1/4 mile east of the pit area, flows intermittently. Flow is typically associated with spring snow melt in the mountains north of the project area, near Prescott.

4.3.1.1 Proposed Action

Potential surface water impacts would result from sedimentation as a result of runoff from the waste rock dumps. Geochemical analysis indicates that the leachate produced in the dumps will not contain heavy metals in excess of allowable drinking water standards. The dumps will not be a source of acid drainage, because of the oxide nature of waste rock and mineralized material. The laboratory analysis of the waste rock and tailings is presented in Appendix E.

Diversion ditches will be constructed around areas of disturbance to channel runoff. The major diversion ditches are above the tailings impoundment. The ditches are designed for the 100-year, 24-hour storm event. The drainage area above the tailings is approximately 55 acres. The tailings area below the diversion ditches is designed to capture the runoff and contain it in with the tailings or release it to the reclaim/recycle pond just below the tailings impoundment.

The reclaim/recycle pond is designed to contain process fluid plus a 100-year, 24-hour storm event. There is also a shut-off valve on the reclaim pipeline from the tailings to the reclaim/recycle pond.

The tailings impoundment can also contain the 100-year, 24-hour storm event. The tailings impoundment and reclaim/recycle pond have synthetic liners, leak detection, and monitoring wells. These redundant systems are designed to minimize a leak of cyanide solution to surface water.

Since there is no surface water near the project area and after analyzing the safeguards, leak detection and monitoring, there will be medium, short-term impacts to surface water. The project is designed for the 100-year, 24-hour storm event and is a zero surface discharge facility.

4.3.1.2 No Action Alternative

Under the No Action alternative, there would be no impact to surface water.

4.3.1.3 Alternative Plant and Tailings Location

The alternative plant site and tailings location would be designed and constructed with the same safety precautions as the proposed action. Diversion ditches would channel the 100-year, 24-hour storm event away from the plant and tailings.

4.3.1.4 Mitigation

The mitigation program outlined in the proposed action will reduce impacts to surface water. The diversion ditches will route runoff away from disturbed areas. All of the facilities are designed to retain the 100-year, 24-hour storm event. No additional mitigation is stipulated.

4.3.1.5 Impacts

The proposed project will disturb 260 acres. Diversion ditches will route runoff away from disturbed sites. All precipitation captured inside the disturbed areas will be retained in the process or will be routed to sedimentation ponds where the runoff will seep into the ground.

No cumulative or significant adverse impacts have been identified. The project will have a medium, short-term impact on surface water.

4.3.2 Groundwater

4.3.2.1 Proposed Action

The tailings impoundment and reclaim/recycle pond are designed and constructed to prevent a discharge to the groundwater. Compacted clay foundations, 40 mil HDPE synthetic liners, and leak detection systems provide the best available demonstrated control technology (BADCT) for protection of groundwater. Potential impacts to groundwater quality, as a result of the proposed facilities, have been eliminated or reduced to a minimum. This is achieved using double liners and leak detection between the two liners. Site characterization indicates that one liner would be sufficient; however, as an added precaution, the proposed design utilizes two liners for the reclaim/recycle pond.

Depth to groundwater in the tailings and reclaim/recycle pond area is 360 feet, with approximately 200 feet of volcanics above the water table. A monitor well is proposed downgradient from the pond, and it will establish a Point of Compliance for the overall tailings facility.

Exploration drilling in the pit area did not encounter significant groundwater at the projected bottom of the pit. Because of the nature of the tertiary volcanic rock in the pit, no significant groundwater should be encountered.

The plant facility will require, on the average, 100 gpm for process water. The water will be supplied by several new wells drilled in Sections 15, 22 and 27. There are existing wells in Sections 15 and 27 which provide data on the existing groundwater hydrology of the area. The area is open to development of groundwater, and several Type II groundwater permits are also available for sale or lease.

4.3.2.2 No Action Alternative

Under the No Action alternative, there would be no impact to groundwater quality or quantity.

4.3.2.3 Alternative Plant and Tailings Location

The alternative plant and tailings location would be designed and constructed similar to the proposed action.

Hydrologic drilling in the alternative tailings location in Section 16 indicated that groundwater was encountered at 90 feet. Although the facility is designed for zero discharge, and the potential for reaching the groundwater is minimal, this alternative has a more shallow groundwater encounter than the proposed action.

4.3.2.4 Mitigation

No additional mitigation is stipulated beyond the precautionary measures described in the proposed action.

4.3.2.5 Impacts

The system is designed to meet the BLM Cyanide Management Plan and Arizona Department of Environmental Quality's BADCT standards. Groundwater is available in the project area to be developed for a beneficial use, either through adjudication or purchase.

No cumulative or significant adverse impacts have been identified. The project would have a low, short-term impact on groundwater quantity.

4.4 Soils

4.4.1 Proposed Action

Surface disturbance associated with the mine, waste rock dumps, plant site, roads, and tailings impoundment would impact approximately 260 acres. An estimated 15 acres have already been affected by earlier exploration and mining activities. The proposed action will disturb an additional 245 acres.

Coversoil will be removed and stockpiled for later use in reclamation. An estimated 3 to 6 inches of coversoil will be salvaged. Coversoil will be spread over the overburden dump (63 acres), tailings impoundment (101 acres), plant site (10 acres), and other minor disturbances, for a total of approximately 190 acres receiving coversoil after final regrading. However, available coversoil may actually be less than estimated, thereby causing some disturbances to remain uncovered.

4.4.2 No Action Alternative

The No Action alternative would cause no further disturbance to soil resources beyond that which has been impacted by previous exploration and mining activities.

4.4.3 Alternative Plant and Tailings Location

The alternative plant site would impact 10 acres of soil which has not been previously disturbed. The tailings impoundment would impact approximately 100 acres of soil, which would be the same as the proposed action.

4.4.4 Mitigation

The mitigation in the proposed action consists of salvage of available coversoil for later use in the reclamation program. No other mitigation is stipulated.

4.4.5 Impacts

The project will disturb approximately 260 acres, of which approximately 15 acres have been previously disturbed. Coversoil will be removed from the pit, tailings, and plant areas. There are no plans to remove coversoil from the two smaller waste rock dump areas, but salvage will be attempted from the larger (third) waste rock dump area.

No cumulative or significant adverse impacts have been identified. Impacts to coversoil would be low and long-term.

4.5 Vegetation

4.5.1 Proposed Action

The proposed action will affect approximately 260 acres, at least 15 of which have been previously disturbed. Selected vegetation which is protected by the Arizona Native Plant Law (ARS Chapter 7) will be removed before surface disturbance activities commence. The plants will be transported to the coversoil stockpiles for later transplanting to the waste rock dumps, plant site, and tailings impoundment areas. Vegetation not transplanted will be salvaged with the coversoil and placed in the coversoil stockpiles, thereby providing additional organic material as well as native seed in the stockpiles.

No mechanical reseeding has been proposed or recommended by BLM because of the lack of precipitation. However, when the coversoil is respread, the native seed will have an excellent opportunity to reestablish. Transplanted vegetation should quickly mitigate impacts to large, cleared areas, and will assist in creating a natural appearance to the disturbed sites.

4.5.2 No Action Alternative

Under the No Action alternative, no new surface disturbance would be allowed. Natural revegetation of existing disturbed areas would continue.

4.5.3 Alternative Plant and Tailings Location

Impacts to vegetation, transplanting, and final reclamation would be the same for this alternative as the proposed action. The disturbance and reclamation of the alternative tailings site in Section 16 would be visible from the highway.

4.5.4 Mitigation

The reclamation plan in the proposed action is adequate for long-term protection of vegetation. No additional mitigation is stipulated.

4.5.5 Impacts

Vegetation on the 260 acres is sparse. Selected protected plants will be removed and placed in the coversoil stockpiles until they are transplanted to their permanent locations. No threatened or endangered plant species were identified on the 1,000 acres surveyed [WRA, 1992].

Native seed will be salvaged with the coversoil. When the coversoil is spread, the native seed may naturally revegetate the disturbed areas. Salvaged plants will be

transplanted to the coversoil areas in the plant and tailings sites. Some may also be placed on the waste rock dumps.

No cumulative or significant adverse impacts have been identified for vegetation. Impacts from the project would be low and long-term.

4.6 Wildlife

4.6.1 Proposed Action

Impacts to wildlife from the proposed action would consist of habitat loss as a direct result of removal of vegetation cover (245 acres) and wildlife avoidance of areas with increased human presence and activity. The habitat loss and displacement would be for the duration of active operations and reclamation. Habitat loss would result in displacement and/or loss of individual small mammals, reptiles, songbirds, and game species that utilize the area.

Three species of special concern are the Sonoran Desert Tortoise, the chuckwalla, and the Yavapai Arizona pocket mouse. These are all Candidate 2 species, which are under study for possible inclusion as threatened/endangered species.

Field studies were performed to look for the desert tortoise and chuckwalla during August 1991 and May 1992. No sign of chuckwalla was observed while surveys were performed. No signs of tortoise (burrows or scat) have been found on any of the area proposed for surface disturbance. Specifically, surveys were made of the tailings area in Section 28 and the mine and waste rock dumps in Sections 21 and 22. These specific disturbance areas were part of the 1,000 acres investigated.

A desert tortoise was sighted, and scat was found, in the SE¼ of Section 15. Tortoise scat was also observed in the SW¼ of Section 21. Both areas are outside of the proposed project disturbances.

Conditions and/or activities which affect the desert tortoise include direct loss of habitat (through surface disturbance), indirect mortality from vehicles, and loss from hunting.

Live mammal trap lines were set out in the mine area and waste rock dump areas. Yavapai Arizona pocket mice were captured. As a control, live traps were also used in Section 21, an area which will not be disturbed. The Yavapai Arizona pocket mouse was also captured in this area, leaving the impression that in several areas of property controlled by NGMC, this Candidate 2 species is quite abundant.

4.6.2 No Action Alternative

The No Action alternative would reduce the habitat loss for wildlife, including the three Candidate species. However, impacts from vehicles and hunting would continue.

4.6.3 Alternative Plant and Tailings Location

Impacts to wildlife would be similar for this alternative as compared with the proposed action.

4.6.4 Mitigation

BLM has developed two management programs for the desert tortoise:

- Desert Tortoise Habitat Management on the Public Lands: A Rangewide Plan, 1988; and
- Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona, 1990.

The 1990 Strategy document will be used for this mitigation plan.

The BLM has rated the general project area as "Interim Category 2 Habitat" for desert tortoise. One method of mitigation is compensation. The following describes the method for calculating compensation, as well as the formula from the 1990 Strategy document.

> Compensation values must be calculated when compensation is used to mitigate impacts of actions on public lands. The Arizona Interagency Desert Tortoise Team (AIDTT) recommends that the compensation formula developed in California be adopted in Arizona. Since that formula (presented below) has proven itself in numerous compensation actions, it will be used as a guide by all BLM offices in Arizona to arrive at compensation rates when compensation must be used to offset unavoidable impacts found in the NEPA process and/or Section 7 consultation process. The area to be disturbed (in acres) is multiplied by the factor derived through use of the formula to determine the amount of compensation required for a given project. The resulting figure represents the number of acres of tortoise habitat that would have to be acquired or improved to compensate for the habitat loss that occurs as a result of proposed actions. As indicated above, compensation can sometimes take the form of cash to fund needed studies or research. When this method is used, the cash will be at least the equivalent of the fair market value of the acres of land derived through use of the compensation formula. The formula is considered interim and may be amended with experience, and to gain consistency with other BLM States.

DESCRIPTION OF FORMULA
AND FACTORS TO BE USED TO COMPUTE COMPENSATION RATE

$$\text{MULTIPLYING FACTOR} = \frac{(L + S + A + G) \times C}{T \times E}$$

CODE	FACTOR	VALUE
L	Land disturbed or lost: a. Tortoise habitat will be disturbed, lost to conservation management, or population density is expected to drop to zero or nearly zero in the future. b. No disturbance or loss; no compensation required.	 1 0
S	Project size (actual area to be disturbed or lost): a. Less than 2 acres b. Between 2 and 160 acres c. Greater than 160 acres	 0.5 1 2
A	Effect on adjacent lands: a. No effect b. Adjacent or other lands will receive additional direct or indirect impacts which will reduce tortoise densities. Impacts will be assigned value of 1 (low), 2 (medium), or 3 (high)	 0 1 - 3
G	Growth inducing: a. No growth or conflict including effects b. Growth inducing or conflict effects	 0 1
C	Habitat Category: a. Lands are in Category I tortoise habitat b. Lands are in Category II tortoise habitat c. Lands are in Category III tortoise habitat. (This zero has the effect of negating compensation in Category III habitat.)	 2 1.7 0
T	Term: a. Long term (longer than 10 years) b. Medium term (2 to 10 years) c. Short term (less than 2 years)	 1 2 3
E	Existing disturbance: a. Little or none b. Some c. Extensive	 1 2 3

Using the formula and factors, a multiplying factor of 2 was obtained, as follows:

$$\text{Multiplying factor} = \frac{(L + S + A + G) \times C}{T \times E}$$

$$\text{Multiplying factor} = \frac{(1 + 2 + 1 + 0) \times 2}{2 \times 2}$$

$$\text{Multiplying factor} = 2$$

The land compensation calculation is 260 acres times 2, or 520 acres. In order to compensate for any potential habitat loss to the desert tortoise caused by operations, NGMC will designate a 520 acre area not to be affected. The areas designated for "no additional disturbance" are located on the east side of the Hassayampa River, on lands included in NGMC's mining claims.

4.6.5 Impacts

Approximately 1,000 acres were surveyed as part of the biological assessment. The major emphasis was to identify threatened, endangered, or candidate species. No threatened or endangered species were identified in the literature or found during the survey.

Three candidate species were identified as potentially occurring on the project site, and several more were identified which might occur in the general area. The data indicate the following listed and candidate species may occur in the vicinity of the subject project [WRA, 1992]:

ENDANGERED SPECIES:	
- Desert pupfish	Cyprinodon macularius
CATEGORY 1 SPECIES:	
- Southwestern willow flycatcher	Empidonax traillii extimus
CATEGORY 2 SPECIES:	
- Arizona toad	Bufo microscaphus microscaphus
- Arizona skink	Eumeces gilberti arizonensis
- Chuckwalla	Sauromalus obesus
- Sonoran desert tortoise	Gopherus agassizii
- Spotted bat	Euderma maculatum
- California leaf-nosed bat	Macrotus californicus
- Yavapai Arizona pocket mouse	Perognathus amplus amplus

The desert pupfish may be found at the Hassayampa River Preserve, located approximately 5 miles north of the project area. The southwestern willow flycatcher was not observed, and its habitat is outside of the project area.

Of the Category 2 species, the following were not observed during the WRA surveys:

- Arizona Toad
- Arizona skink
- Chuckwalla
- Spotted bat
- California leaf-nosed bat.

The Sonoran desert tortoise and the Yavapai Arizona pocket mouse were observed on the project area. The mitigation program for the desert tortoise, as outlined in Section 4.6.4, should reduce potential adverse impacts to this species.

As indicated in the WRA report in Appendix C, the pocket mouse has been found in several areas and appears to be common in the general area.

No cumulative or significant adverse impacts have been identified. Impacts to wildlife will be low and long-term.

4.7 Land Use

4.7.1 Proposed Action

The proposed project area is located on public lands open to mineral development. The development of minerals meets the requirements of the MFP for the area. The project will not interfere with the recreation potential of the general area, although the 260 acres will be posted, and access will be restricted for public health and safety.

There are no wilderness or ACECs which would be impacted.

Cattle grazing can continue in the area, although portions of the project will be fenced to exclude cattle. The project will have no significant impact on wild burros.

4.7.2 No Action Alternative

Under the No Action alternative, there would be no change to the existing land use.

4.7.3 Alternative Plant and Tailings Location

This alternative would have the same impacts as the proposed action.

4.7.4 Mitigation

No mitigation is stipulated.

4.7.5 Impacts

No cumulative or significant adverse impacts were identified. Impacts would be low and long-term.

4.8 Cultural Resources

4.8.1 Proposed Action

The cultural resource survey identified two prehistoric sites and 16 historic sites. The proposed project will impact three sites. The first site has an old section of pipe used to pump water from the Hassayampa to the Vulture Mine; the other two sites consist of old shafts and trash scatters.

4.8.2 No Action Alternative

Under the No Action alternative, these three sites would not be impacted.

4.8.3 Alternative Plant and Tailings Location

If the alternative plant and tailings location were to be selected, two additional sites would be impacted in the Section 16 tailings area. Both are old mine areas. The "pipe" site (described above) would not be impacted as part of the Section 28 tailings.

4.8.4 Mitigation

A mitigation program will be developed in a cooperative effort among the BLM, the Arizona State Historic Preservation Office, and NGMC.

4.8.5 Impacts

No cumulative or significant adverse impacts have been identified. Impacts would be low and short-term.

4.9 Aesthetics

4.9.1 Proposed Action

Visual

The assessment of visual impacts will be based upon the visual contrast rating system methodology described in the BLM VRM Visual Contrast Rating Handbook (BLM Manual Handbook, Section 8431-1). Effects to visual resources will be assessed for the construction, operation, and closure of the proposed mine. Relative value of the visual environment was established by BLM Visual Resource Management Classes. Impacts would occur if visual contrasts are identified for landscape modification affecting the following:

- The quality of any scenic resources;
- Scenic resources having rare or unique value;

- Views from, or the visual setting of, designated or planned parks, wilderness, natural areas, or other visually sensitive land use;
- Views from, or the visual setting of, travel routes; and
- Views from, or the visual setting of, established, designated, or planned recreational, educational, preservational, or scientific facility, use area, activity, and viewpoint or vista.

The extent to which the proposed mine project would affect the visual quality is dependent upon the amount of visual contrast created between the new facilities, and the existing landscape elements (form, line, color and texture) and features (land and water surface, vegetation, and structures). The project's visual contrast was assessed in this manner to determine the severity of potential impacts and to guide the development of mitigation measures to enable the VRM objectives would be met.

The VRM class for the project area is II. Changes to the basic elements by the mining activities should not be evident. Visual contrasts may be seen, but should not attract visual attention.

Two key observation points (KOPs) were identified for the study area. The first is located along U.S. Highway 93, just north of Morristown at the crossing at Little San Domingo Wash. The view distance is 2.6 miles east of the project site. This view point is representative of viewers driving or walking along the highway. The visual contrast of the project, as viewed from this KOP, was rated as moderate. The removal of vegetation would create weak form and line contrast, and moderate color and texture contrasts. The lowering of the two small hills would create weak form, line, and texture contrast, and moderate color contrasts.

The second KOP was designated at the base of Gates Road near the crossing of the Hassayampa River. The view distance is approximately 0.5 miles east of the project site. The KOP would cause moderate texture and color contrasts. Form and line contrasts would be weak. The project would reduce (or "top off") two hills, creating a flattened hilltop at skyline. The landform modification would create moderate to strong contrasts in landform; moderate contrast to color and texture; and weak contrast in "line."

The most effective mitigation technique to reduce visual contrast will be to strategically locate facilities out of sight; minimize ground disturbance; and repeat the basic landscape elements of form, line, texture and color in the mining facility and activities.

Noise

Sound is normally reduced by 6 dBAs every time the distance from the sound is doubled. Reflection from structures, topography, and atmospheric layers can increase or decrease the sound level, depending on whether sound waves are directed toward or away from the receptor point. Vegetation and other sound-absorbing materials will tend to reduce both direct and reflected sound waves. Wind direction and velocity can also affect the sound intensity at a receptor point. Table 4-1 presents typical sound levels for mine and plant equipment.

Table 4-1
TYPICAL SOUND LEVELS FOR MINE AND PLANT EQUIPMENT

EQUIPMENT / OPERATION	DISTANCE (ft)	SOUND LEVEL (dBA)
Haul truck, loaded	30	80
Haul truck, unloaded	30	77
Water truck, 10-12 mph	30	75
Crawler tractor	100	72
Wheel loaders (2 working together)	55	71
Screens	*	95-105
Blowers, crushers, feeders, chutes	*	90-105
Motors, gear drives, hoppers, pumps	*	85-95
Belt conveyors	*	75-85
Primary blasting	1,000	70-120

* At operator's position, assume 30 feet.
SOURCE: M&EC and manufacturers' data.

The approximate distances from the proposed project facilities to the nearest residences are as follows:

Pit	2,000 feet
Crushing Plant	4,500 feet
Waste Dumping Point (closest)	4,000 feet
Tailings	8,000 feet

The sound of the operation at the nearest residence should not exceed 65 dBA. This is typical of daytime noise levels. The sand and gravel in the Hassayampa riverbed should effectively dissipate and muffle the shock from blasting.

4.9.2 No Action Alternative

Under the No Action alternative, there would be no aesthetic impacts to the area.

4.9.3 Alternative Plant and Tailings Location

The alternative plant site would be visible from the highway at the Key Observation Points. The most obvious visual change would be from light-colored tailings which would be very visible on the slope of Section 16. The noise levels would be comparable to the proposed action.

4.9.4 Mitigation

No additional mitigation is stipulated.

4.9.5 Impacts

The project facilities have been designed to minimize visual impacts from the highway. Noise levels will be shielded by topography. Blasting will occur between 8:00 am and 5:00 pm.

A dust suppression program has been outlined, and an air quality permit with restrictions will be issued by Maricopa County.

No cumulative or significant adverse impacts have been identified. The aesthetics impacts would be low and long-term.

4.10 Socioeconomics

4.10.1 Proposed Action

The Newsboy Gold Mine would contribute 40 jobs and personal income of $1,200,000 annually directly to the economy of the Wickenburg-Morristown area during its possible 5 years of full production. This would directly reduce the area's unemployment rate to about 2%, and would result in the addition of about 30 new households and 75 new residents to the community. The mine also would provide $130,000 each year directly to local businesses in purchases of products and services, and $127,000 each year in local government revenues. Most of the latter would go directly to the Morristown School District. The accumulated direct and indirect impact on the local economy would exceed $2.2 million per year.

Business firms elsewhere in the state, most of them in the Greater Phoenix area, would receive income of $3,870,000 each year from purchases by the mine. State

and local governments throughout Arizona would receive a total of $616,000 each year. The total direct impact on the Arizona economy would amount to $5,816,000 annually.

4.10.2 No Action Alternative

The No Action alternative would prevent 40 new jobs with corresponding increases in annual income and tax revenues.

4.10.3 Alternative Plant and Tailings Location

Alternative siting for the plant and tailings would not alter the socioeconomic effects of the project.

4.10.4 Mitigation

No mitigation is stipulated.

4.10.5 Impacts

The socioeconomic study indicates that there may not be a large labor pool available in the Wickenburg-Morristown area to supply the project needs. As many as 30 new employees and their families may move into the area. With the close proximity of Phoenix and the closure of the Congress Mine, potential employees may commute rather than move to the area.

The annual payroll of $1.2 million would stimulate the local economy.

No cumulative or significant adverse impacts have been identified. Impacts would be medium and short-term.

4.11 Transportation

4.11.1 Proposed Action

Construction materials and operational supplies will be purchased in Wickenburg or Phoenix and hauled to the site using existing roads and highways. Although the railroad is adjacent to the property, it is not likely that a stop would be scheduled to deliver small amounts of material at the Castle Hot Springs siding.

4.11.2 No Action Alternative

The No Action alternative would produce no additional truck traffic on State Highway 93.

4.11.3 Alternative Plant and Tailings Location

Selection of this alternative would have the same effect on transportation as the proposed action.

4.11.4 Mitigation

Mitigation will include a joint maintenance program with the County.

4.11.5 Impacts

No cumulative or significant adverse impacts to transportation were identified. Impacts to transportation will be low and short-term.

4.12 Unavoidable Adverse Effects

Implementation of the proposed action will produce unavoidable adverse effects on the environment. However, the mitigation program in the proposed action, in combination with additional mitigation measures stipulated by BLM, will reduce the adverse impacts to acceptable levels.

The following critical elements were considered in the review of environmental impacts. Because of their importance, they are listed separately.

CRITICAL ELEMENT AFFECTED?	YES	NO	CRITICAL ELEMENT AFFECTED?	YES	NO
Air Quality	√		T & E Species		√
Areas of Critical Environmental Concern		√	Wastes, Hazardous/Solid		√
Cultural Resources	√		Water Quality	√	
Farmlands, Prime/Unique		√	Wetlands/ Riparian Zones		√
Floodplains		√	Wild & Scenic Rivers		√
National American Religious Concerns		√	Wilderness		√

Implementation of the proposed action would cause some adverse effects during the life of the project which cannot be avoided. The intensity of these unavoidable effects will be lessened by mitigation measures. In this discussion, short term is defined as the life of the project (5 years); long term is defined as beyond the proposed life of the project. Adverse effects which cannot be entirely mitigated include short-term and long-term alteration of landforms.

Local air quality will be affected over the short term by particulates created by mining and processing operations. However, such impact would be minor, and resulting air quality would not violate Arizona or federal air quality standards.

The cultural resource survey identified 18 historic and prehistoric sites in the project area. A mitigation program has been developed and will be implemented before surface disturbance from the project is approved. All cultural sites identified in areas to be disturbed will be documented and removed or destroyed.

Short term consumption of groundwater by the operation should not significantly affect any current groundwater users. Project components are designed to minimize impacts to surface and groundwater quality. A monitoring well will be developed downgradient from the tailings impoundment and reclaim/recycle pond. A monitoring program will also be implemented to evaluate the effectiveness of the components in the leak detection systems.

Increased soil erosion from wind and water would occur over the short term at the project site. The proposed erosion control program will minimize this erosion to acceptable levels; however, erosion cannot be completely eliminated.

For the short term, impacts to vegetation cannot be mitigated. The length of time that these impacts remain unmitigated will depend on the specific component location, the length of the mining operation, and the time necessary to re-establish vegetation. This time period would extend from initial disturbance through the successful establishment of a self-sustaining vegetation community. Vegetation will be disturbed or removed from approximately 245 acres. Revegetation will be implemented on approximately 190 acres.

Wildlife communities will be affected in both the short and long term. Site development will displace wildlife, particularly mule deer, onto adjacent habitats in the short term. Following closure and revegetation, wildlife would be expected to return to the site.

There will be a long term alteration of viewshed along Highway 60 caused by the introduction by the project of contrasting colors, lines, and landforms. Over time, these introduced elements will become less noticeable. The operation will require nighttime lighting, but shields will be installed to reduce this short-term impact.

Increased traffic in and around Morristown, including industrial trucks, will have a short term impact on traffic safety and the human environment.

5.0 Persons and Agencies Consulted

5.1 Contacts

The following agencies were consulted as part of the preparation of this Environmental Assessment.

Federal Agencies

Department of Agriculture - Soil Conservation Service
Department of the Interior - Fish and Wildlife Service
Environmental Protection Agency
U.S. Army Corps of Engineers

Arizona State Agencies

Arizona Commission of Agriculture and Horticulture
Arizona Department of Environmental Quality
Arizona Game and Fish Department
Arizona Mine Inspector's Office
Arizona State Land Department
Arizona Water Resources Department

Local Agencies (Maricopa County)

Bureau of Air Pollution Control
Flood Control District
Planning and Zoning

5.2 Preparers

The following individuals were involved in the preparation and/or review of this Environmental Assessment.

Bureau of Land Management - Lower Gila Resource Area, Phoenix District Office

The interdisciplinary team members for the Newsboy Gold Mine Project Environmental Assessment are identified below.

Area Manager	- John Christensen B.S., Forest Management Utah State University 17 years of BLM experience
Surface Protection Specialist	- Hank Molz B.S., Forest Management Northern Arizona University 22 years of BLM experience
Supervisory Wildlife Biologist	- Tim Goodman M.S., Range Management, New Mexico State B.S., Wildlife Ecology, University of Arizona 7 years of BLM experience
Wildlife Biologist	- Lori Young B.S., Wildlife Biology Arizona State University 1 year of BLM experience
Archaeologist	- Connie Stone Ph.D., Anthropology Arizona State University 6 years of BLM experience
Archaeologist	- Jane Pike B.A., Anthropology University of Kentucky 6 years of BLM experience
Geologist	- Mark Schwab B.A., Geological Sciences University of California, Santa Barbara 3 years of BLM experience

Third Party Contractor

FLETCHER ASSOCIATES

Gary Fletcher	B.S. Agricultural Engineering University of Wyoming 19 years of environmental experience

Contributing Consultants

WATER RESOURCE ASSOCIATES, INC.	-	Archaeology - Geology - Hydrology - Biological Assessment
WESTERN RESOURCE DEVELOPMENT	-	Ecology
WESTERN ECONOMIC ANALYSIS CENTER	-	Socioeconomics
ROBERT SCOTT CONSULTING	-	Aesthetics
TRC ENVIRONMENTAL CONSULTANTS	-	Air Quality
LYNTEK	-	Geotechnical and Processing

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APPENDIX A

SURETY BOND ESTMATE

APPENDIX B

WATER RESOURCE ASSOCIATES' HYDROLOGY REPORT