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Chapter 6

Reclamation Plan

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6.0 General Overview

Approximately 250 acres will be disturbed during the life of the operation. Of this acreage, all but 30 acres will be reclaimed. The majority of the unreclaimed acreage will be in the Padre, Hamburg, Main and Basin pits. Both the Main and Hamburg pits will be backfilled to some degree, although not enough material will be available to return them to their original contours. Therefore, although the backfilled portions will be reclaimed, some highwalls will remain in both pits. Because new ore deposits are being mined radially outward from the central mine facilities, it is not possible to backfill the Padre or Basin Pits. These pits will remain totally unbackfilled, impounding water seasonally due to local runoff within the pits.

Interim reclamation will take place on dumps and leach pads as they are phased out of the mine operations. Table 6.0-1 provides a summary of the interim reclamation areas, and schedule. The areas to be reclaimed during operations are shown on Drawings GS-005 and GS-008. There will not be water available for use during interim reclamation. The majority of the reclamation will take place upon the completion of the operation. The reclamation treatments are shown of Drawing No. GS-011; post reclamation contours are shown on Drawing No. GS-012

Table 6.0-1 Interim Reclamation Schedule

Area	Acres	Topsoil Date	Reseed Date
Hamburg Pit (Peak)	6.5	Aug, 1990	Aug, 1990
Hamburg Pit	2.4	Nov, 1990	Nov, 1990
Hamburg Pit	18.5	Oct, 1992	Oct, 1992
Dump # 2	9.7	Aug, 1992	Oct, 1992

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6.1 Land Use

The current land use is predominantly as wildlife habitat. The area does not lend itself to grazing due to the sparse undercover vegetation and lack of grass. Recreational uses of the area include hunting and four-wheel drive recreation. Mining has been a prevalent use in the area on and off since the turn of the century, and a considerable amount of surface disturbance exists as a result of exploration activities in past years.

Mining claims had been located at Goldstrike by 1910, but the date of the first gold discovery is not known. A three-stamp amalgamation mill was erected in 1914, but very little gold was actually produced and the district soon sank into obscurity.

The first modern exploration project in the Goldstrike area began in 1975, and the following companies have conducted exploration efforts at the property:

1975-1976	Gold Resources, Inc.
1977-1978	Lustor Gold Mines, Inc.
1978-1979	Occidental Minerals
1979-1981	Houston International Minerals Company
1982-1985	Permian Exploration Account
1985-1986	Inspiration Gold, Inc.
1987	Tenneco Minerals Company

As a result of these activities, the area has experienced considerable prior surface disturbance. Most of this disturbance is associated with the construction of roads to access the over 300 exploration holes drilled at the site.

Post-reclamation land use will be essentially the same as its current use.

6.2 Demolition and Disposal

The buildings and process equipment are relatively portable, so that they can easily be removed upon completion of processing. The buildings and equipment will either be sold or shipped to a subsequent gold mining operation.

Prior to decommissioning, the solution ponds will be tested for cyanide content. If necessary, the residual cyanide will be neutralized by the addition of sodium hypochlorite. The ponds will then be allowed to evaporate to dryness and the liners will be shredded with a ripper on a dozer. Concrete foundations from the buildings and equipment will be placed in the pond basins and buried along with the shredded liners.

Prior to the ponds being allowed to evaporate to dryness, any residual cyanide left in the ponds will be neutralized to the same cyanide standard as the leach pads. The liquids

and solids in the pond bottoms will also be sampled and analyzed for any hazardous characteristics under the Federal and State hazardous waste regulations. If the wastes are found to be hazardous under these regulations, the wastes will be handled according to the requirements of the applicable State and Federal hazardous waste regulations.

The entire plant site will then be graded, as necessary, to achieve rounded contours, after which it will be topsoiled and seeded as described below.

6.3 Facilities Closure

After leaching has been completed, the leach pad will be flushed with water until the residual free cyanide level in the runoff is 5 ppm or less according to Utah Bureau of Water Pollution Control standards. Rinsing of the leach pads is planned to begin in 1992 for those pads that are no longer being leached. After rinsing has been completed, the leach pad will be allowed to drain (residual moisture content between 6 and 8 percent) before the leach material is regraded.

The BLM will want to maintain a road through the mine site to connect their Road No. 42529 with the County road along East Fork of Beaver Dam Wash. The road will mostly consist of the existing main access road through the site. After reclamation, a portion of the road will be constructed over the northern margin of Leach Pad # 2 as shown on Drawing GS-010. With the exception of this road, the remaining haul roads will be ripped, topsoiled, and drill seeded to a depth of ½-inch with the seed mix listed in Section 6.10. The area will be fertilized and mulched as specified in Sections 6.8 and 6.9. Prior to ripping, culverts will be removed and drainage channels will be reestablished across the road. The culverts will be salvaged if possible.

The sediment dam and fill dam in Quail Canyon will be left in place after reclamation. These dams will trap fresh water after precipitation events and will be beneficial to wildlife in the area. Dismantling the dams would be costly and is not justified. The ponds will encompass only 7.1 acres at maximum water levels, so the surface disturbance associated with these facilities is minimal.

The water pipeline from the D.I. Ranch will be removed and salvaged if possible. Where the pipeline crosses East Fork Beaver Dam Wash the crossovers will be replaced with riprap. The Pipeline access road to the D.I. Ranch will be reclaimed.

The perimeter barbed-wire fence will remain in place until reclamation is completed and the surety bond has been released.

The two radio towers will be removed, as will the concrete slabs which support them. There is no road to the radio towers to reclaim.

6.4 Regrading

Leach Pads

The overall final shape of the leach pads will be a terraced pyramid configuration. The heaps will have a maximum height of 160 feet with overall slopes of 2:1. Although this would be consistent with the surrounding terrain, the outer slopes of the heaps will be regraded to 2.5:1 during reclamation.

The leach pad foundation will be constructed of waste rock at an overall slope of 2:1. Economics and terrain restrictions require that this slope be retained after reclamation. This will be consistent with the surrounding terrain, since there are many areas in the mine site where existing slopes exceed 1.5:1.

After the heaps have dried, they will be reclaimed as discussed in Sections 6.6 through 6.10

Waste Rock Piles

The waste rock piles will also have a terraced configuration, with 20 foot wide setbacks for every 70 feet of vertical rise. The overall slope will be 29 degrees, with maximum slopes of 33.7 degrees. Although the overall slope will be 1.8:1, it will be less steep than adjacent terrain near Hamburg peak, where the natural slope exceeds 1.5:1.

The waste rock piles will be reclaimed as discussed in Sections 6.6 through 6.10.

Pits

The final slopes of the pits will vary between 50 degrees and 56 degrees. Slope stability analysis has established that these slopes will be stable for the life of the operation, and for some time afterward. Long term stability cannot be determined until mining is well underway and all of the pit walls have been exposed. Previously identified slippage surfaces in the Padre Pit will be mined out as the pit is developed. Cutting back the pit walls to provide added safety factors would be uneconomical, create additional surface disturbance, and require additional surface drainage considerations. Safety berms or fences will be constructed adjacent to highwalls remaining after mining in the Padre and Basin Pits.

The Hamburg pit will be partially backfilled. Most of the acreage in the Hamburg pit will be reclaimed, but about 280 vertical feet of highwall will remain on the southwest side of the pit. The Hamburg pit will have the capacity to contain runoff from the small drainage area between it and the Quail Canyon dam. The Main pit will not impound any water because it will be backfilled to the point where surface runoff will drain away from the pit.

The Padre and Basin pits will be the last pits to be mined, and consequently will not be backfilled. These pits will not be mined below the static water level, however, because they will be topographically closed basins, they may impound water. Because of the mountain-top location, runoff into the pits will be minimal. Any water that does collect in the pit should evaporate quickly.

The Goldtown Pit will be completely backfilled with waste material removed from the Basin Pit. Any surface disturbance associated with this pit will be reclaimed with the surrounding contractors staging area.

6.5 Drainage and Sediment Control

Upon reclamation, all ditches will be left in place. Accordingly, they have been designed to pass the peak flow from the 100-year 24-hr storm event. The culvert and diversion along the main haul road, which drains a portion of the drainage area A and A', will be left in place and will be maintained by the BLM. Two other culverts adjacent to the crushing area and one culvert to the south of the pond area will be removed during regrading activities. Reclaimed roads will have water bars installed according to the following specifications:

Road Grade (percent)	Space (feet)
10 to 14	100 to 200
6 to 10	200 to 300
4 to 6	300 to 400
less than 4	as needed

Surface runoff from the reclaimed site will be no greater than runoff from the mine site during operation. In fact, runoff and sediment transport should decrease once vegetation has been established. All silt fences will be left to control potential storm silting events after reclamation.

The sediment dam will remain intact after reclamation is completed. This structure will be reclaimed using the same techniques as the rest of the mining site.

6.6 Topsoil Plan

Prior to mining, topsoil has been, and will be stripped from the proposed area of disturbance.

The present topsoil plan takes into account the actual salvageable topsoil materials available, the revegetation requirements for critical sites and the use of substitute soil materials to provide adequate rooting depth and water holding capacity. The key to revegetation success will depend on the water holding capacity of the planting medium in

this high evaporation zone. The water holding capacity will depend primarily upon the amount of fine-grained materials available in the planting medium.

It is proposed that additional fine-grained waste materials be stockpiled on site to use as fill in waste rock dumps and other sites where large materials with numerous voids will not provide adequate water storage capacity. The fine grained material will also be placed on slopes steeper than 2.5:1. The substitute waste material will fill the voids and provide a competent base for the topsoil materials. The red bed clay materials will be tested for suitability as fill material, and if free of restrictions will be stockpiled during the proposed waste dumping operations.

Proposed topsoil and fill depths for each revegetation site are shown on Drawing GS-011 and summarized below.

Topsoil storage sites	0" topsoil
Ripped roadbeds	6" topsoil
Flat surfaces (dump tops, leach pad tops, backfilled pits)	6" topsoil
Regraded slopes < 2.5:1	8" topsoil
Regraded slopes > 2.5:1 and slopes with blocky material	8" topsoil + 6" fill

Topsoil is a scarce commodity in the area. The present soil survey indicates that about 193,000 cubic yards of topsoil should be available for stockpiling. All available topsoil will be salvaged, except where slope or rocky terrain make it impossible. In addition to stockpiling topsoil, Tenneco will stockpile approximately 10,000 cubic yards of the fill material to be used on steep and/or rocky slopes. This stockpile will be located in the north corner of the Hamburg Pit after it is backfilled. Where terrain allows, topsoil will be placed by 32-yard belly dump scrapers. The side slopes of the leach pad foundation, the heap leach, and the waste rock piles will be too steep to accommodate the use of scrapers. Here topsoil will be pushed and distributed over the sideslopes with dozers. The benches on the leach pad and waste rock piles will be widened as necessary to accommodate dozers and scrapers. Total topsoiling of this area can be achieved.

All topsoil stockpiles will be revegetated according to the methods discussed below.

6.7 Seedbed Preparation

All compacted surfaces will be ripped to a depth of 12 inches with rippers spaced 24 inches apart prior to topsoiling. After placement, the topsoil will be ripped to a depth of 6 inches with rippers spaced 18 inches apart to relieve compaction and bind topsoil to underlying materials.

6.8 Fertilization

A diammonium phosphate dry pellet fertilizer will be applied at a base rate of 200 lbs/acre unless analysis of the topsoil indicates a different rate is required.

6.9 Mulching

Hay will be blown onto the topsoiled sites at the rate of 2 tons per acre. The seed drill or raking will cover the mulch and anchor it in the root zone. On slopes steeper than 2.5:1 erosion matting will be stapled to the slopes to hold the mulch, fertilizer and seed in place on the slope.

6.10 Seeding and Planting

After topsoiling, the disturbed acreage will be seeded with the following seed mix:

Seed	lbs/acre pure live seed
Bitterbrush	4
Serviceberry	1
Cliffrose	2
Indian ricegrass	2
Crested wheatgrass	4
Thickspike wheatgrass	2
Russian wildrye	2
Eaton penstemon	1
Yellow sweetclover	2
	20 lbs/acre

Seeding will take place in the fall after October first.

Tenneco has agreed with the BLM to regrade leach pad slopes to 2.5:1, which will allow for equipment operation. A seed drill set at ¼- to ½-inch planting depth operating on the contour would be used to create contour furrows on the slope, a proven soil surface

1st Year

March - June	biweekly
July - October	monthly

2nd Year

March - June	monthly
July - October	bimonthly

3rd Year

April - September	bimonthly
October - reclamation release	

Impounded waters and sediments would be sampled during the reclamation monitoring period to check on contamination.

Chapter 7

Requests for Variances

7.0 Variance Request from Rule R613-004-111-9

Five potential impounding areas will exist after reclamation; the area upstream of the sediment dam, the area upstream of the Quail Canyon dam, the Padre Pit, the Basin Pit, and a portion of the Hamburg Pit. A variance is requested from rule R613-004-111-9 to allow these areas to impound water. The Padre and Basin pits will be mined at the end of the mine life, and consequently will not be backfilled. In addition, due to Padre Pit's mountaintop location, runoff to the pit will be minimal. Because there will not be any sulfide ore mined from either of the pits, there should not be any potential for acid generation in the water.

The dams are designed to contain the runoff from the 100-year 24-hr storm event. In addition, they have been designed with spillways that will pass the runoff from the 100-year 24-hr storm event. Tenneco proposes to leave these structures in place after reclamation. Dismantling either of these containment structures would be costly and not justified. Any water that does collect in the pits or behind the dams will either evaporate or will be utilized by wildlife. These sites would be topsoiled and revegetated by the same techniques as the remainder of the mine site.

A portion of East Hamburg Pit will only be backfilled to within five feet of the surrounding terrain. This impounding area will be topsoiled and revegetated by the same techniques as the remainder of the mine site. Should any water collect in this impounding area it would be beneficial to vegetation and wildlife.

7.1 Variance Request from Rule R613-004-111-6

Where possible, the final reclaimed slopes at the mine site will be no greater than 2:1. However, there is one area in which topographic constraints require that the slope be left at 1.5:1. This area is located on the southwest side of Hamburg Peak. Regrading the area to 2:1 slopes will not be possible because the final configuration would obstruct the Arsenic Gulch drainage. The area was topsoiled and seeded in August, 1990 with a seed mix approved by the DOGM. Because regrading this slope would disturb additional acreage and would be costly, a variance from Rule R613-004-111-6 is requested.

7.2 Variance Request from Rule R613-004-111-7

Tenneco will be leaving some highwalls in the Main, Padre, Basin, and Hamburg Pits. The slopes of these highwalls will be between 50° and 56°. Slope stability analysis (Appendix F) shows that these slopes will be stable for the life of the operation, and for sometime afterward. Long term stability cannot be determined until the pit walls have been exposed. However, cutting back the walls to 45° would be uneconomical, create additional disturbance, and require additional surface drainage considerations. Therefore, Tenneco requests a variance from Rule R613-004-111-7 for these highwalls.