

**PacifiCorp
Trail Mountain Mine**

Nowhere did monitoring identify subsidence greater than a few tenths of feet. PacifiCorp will use aerial photogrammetric survey methods and annual helicopter reconnaissance flights to monitor subsidence. Baseline photography was conducted August 6, 1993 including color infrared (See Chapter 12 for details on subsidence monitoring.)

3.4.8.4 SLIDES AND OTHER DAMAGE

At any time a slide occurs which may have a potential adverse effect on public property, health, safety or the environment, PacifiCorp shall notify the Division by the fastest available means and comply with remedial measures required by the Division.

3.4.9 WASTE DISPOSAL

PacifiCorp has contracted with local firms to handle and remove all non-coal wastes from the mine site. Non-coal wastes and materials that constitute a potential fire hazard are hauled by a licensed contractor to a state approved waste disposal area.

Waste oil is collected in drums in a designated storage area at the site. A licensed contractor will pick up this material on a regular basis and remove it for recycling purposes.

It should be noted that during a spoils survey, it was pointed out that there was no evidence of toxic materials at this mine site (Mr. George Cook, SCS). Prior to reclamation, all spoil material will be re-sampled in a comprehensive random method and retested in accordance to UDOGM guidelines for acid and/or toxic forming potential. Sampling will be conducted per Appendix 9-1, Attachment C.

Sediment pond waste is removed from the site and disposed of in the Cottonwood/Wilberg Waste Rock Site in accordance with the Division's "Sediment Pond

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Clean out Procedural Guidelines". The Division will be notified and procedures will be approved prior to the start of pond cleaning activities. Previous analyses of this material have shown it to be non-toxic and non-acid forming. The sediment material will be sampled and tested according to Division "Title V Coal, Program Policy for Disposal of Sediment Pond Waste".

Underground development waste is kept underground as allowed by MSHA regulations. In the event this material must be brought out of the mine, it will be hauled to the Cottonwood/Wilberg Waste Rock Site and disposed of in an approved manner.

There are no coal washing facilities at this mine site; therefore, there are no refuse or other permanent waste piles located at the Trail Mountain Mine. The waste rock temporary storage area is shown on Plate 3-1.

3.5 RECLAMATION PLAN

Reclamation of the Trail Mountain Mine site will be accomplished in an efficient and environmentally sound manner. This section addresses the reclamation plans for the site. Seven areas are addressed: contemporaneous reclamation, soil removal and storage, final abandonment, backfilling and grading, revegetation, reclamation schedule, and reclamation cost estimate.

3.5.1 CONTEMPORANEOUS RECLAMATION

The mine disturbs only a minimal area for surface facilities. Most of the disturbed area will be needed for operations during the life of the mine. Those areas not needed (outslopes, embankments, etc.) will be prepared, seeded with quick growing species and mulched to provide protection and cover to reduce erosion. (See following section,

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"Contemporaneous Reclamation Plan for Trail Mountain Mine" and Plate 3-9 for location of contemporaneous reclamation.)

CONTEMPORANEOUS RECLAMATION PLAN

FOR TRAIL MOUNTAIN MINE

PLANTING DATES

Seeding will normally occur in October or November of the year, depending on climatic conditions at that time. This will allow little chance of premature germination, increase the likelihood of hibernation (or inactivity) of most seed predators and will allow seed emergence in early spring when moisture conditions are most favorable.

PLANT SPECIES

Plant species used for temporary, contemporaneous reclamation with their respective justifications are listed below:

Agropyron dasystachyum --Thickspike Wheatgrass-- This grass species was chosen for its on-site adaptability of these climatic patterns, high salt tolerance, sod forming characteristics and rapid establishment capabilities.

Oryzopsis hymenoides--Indian Rice grass-- This grass species has excellent success on spoils establishment and has moderate salt tolerance qualities.

Astragalus cicer--Silklepod Milkvetch--This forb will be planted because it is sod forming, nitrogen fixing, has moderate salinity adaptation, has establishment qualities and for aesthetics values.

Melilotus officinalis--Yellow Sweetclover-- This species is an introduced forb that establishes readily on severe disturbed sites. It is also a nitrogen fixing plant that has high affinity for salt tolerance.

No shrub or tree species are included in the seed mix for contemporaneous reclamation.

SEEDING METHODS

Slopes less than 20% will be drill seeded, or seeded by hydro seeder or hand broadcast methods. Slopes greater than 20 % will be seeded by hydro seeder or hand broadcasting.

MULCH

Hydro seeded areas will be sprayed with a wood fiber mulch. Since this is temporary reclamation the application of mulch will be optional on areas of drill seeding or seeded by hand broadcasting.

FERTILIZATION

Contemporaneous reclaimed areas will be visually checked on a yearly basis to determine success. Qualitative observations of interim or contemporaneous revegetation will be submitted in the annual report. An appropriate fertilizer will be applied if it appears necessary to increase plant vigor or to obtain the desired cover.

FUTURE CONTEMPORANEOUS RECLAMATION

If additional areas are disturbed or, if current disturbed areas become idle, contemporaneous reclamation procedures (as described above) will be implemented pursuant to R645-301-352.

***Note: seeding rates of species will be in equal proportions totaling 52 PLS per square foot, with not more than 20 PLS per square foot of any one species.**

3.5.2 SOIL REMOVAL AND STORAGE

The Trail Mountain Mine site is an active site. The mine was operational before the 1979 State Act or the 1977 Federal Act. Having been constructed prior to the requirement to save and stockpile topsoil, the soils on the site were used in construction of the roads and pads.

A post-law borrow pit was utilized on site to obtain fill material for the 66" culvert for Cottonwood Creek. Topsoil was salvaged from the pit area, and is stockpiled in a protected area just northwest of the intake portal for the mine. The pile has been revegetated, and is further protected by installation of a silt fence around the bottom end.

No additional area is planned on being disturbed, therefore, it is unlikely that any topsoil will be encountered. However, if in the future, during upgrading operations or facility modifications, any salvageable topsoil is found, it will be tested in accordance with the "UDOGM Guidelines for Management of Topsoil and Overburden, Table 1", and if found satisfactory, will be saved and stockpiled in a location acceptable to the regulatory authority.

3.5.3 FINAL ABANDONMENT

Upon final abandonment of the mining operation, the mine portals and openings will be sealed, the structures removed, and the drainages restored. More detailed description of the procedures to be followed will be found in the following sections. Unmined recoverable coal reserves will be protected in accordance with 43 CFR 3482.1

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(c) (3) (IV). Prior to the abandonment of any part of the Trail Mountain Mine, **PacifiCorp will get approval from authorized officers of the BLM.**

3.5.3.1 SEALING OF MINE OPENINGS

A-PORTAL SEALING

Upon completion of mining activities, the portals will be sealed in accordance with State and Federal regulation. A typical drawing of portal sealing to be used is shown in Figure 3-7. Seals will be located at least 25' inside the portal entry. All loose material around the seal area will be removed for roof, rib and floor prior to installation. The mine entry seals will be made of solid concrete blocks to form a wall two blocks thick..

B-DRILL HOLE SEALING

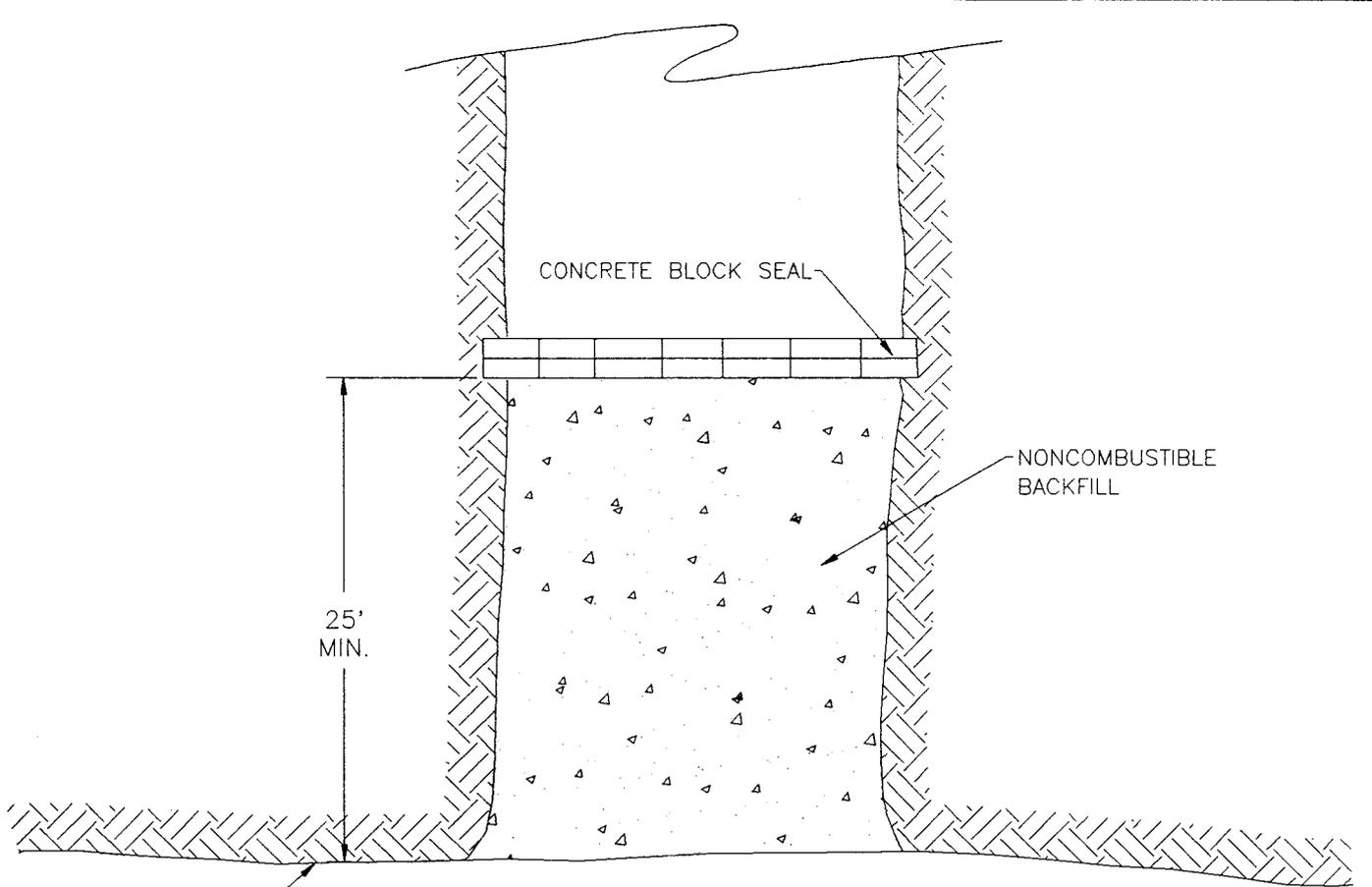
Exploration drill holes will be sealed to BLM specifications which entails sealing each hole from total depth to the surface with cement. See (Figure 3-8).

3.5.3.2 REMOVAL OF SURFACE STRUCTURES

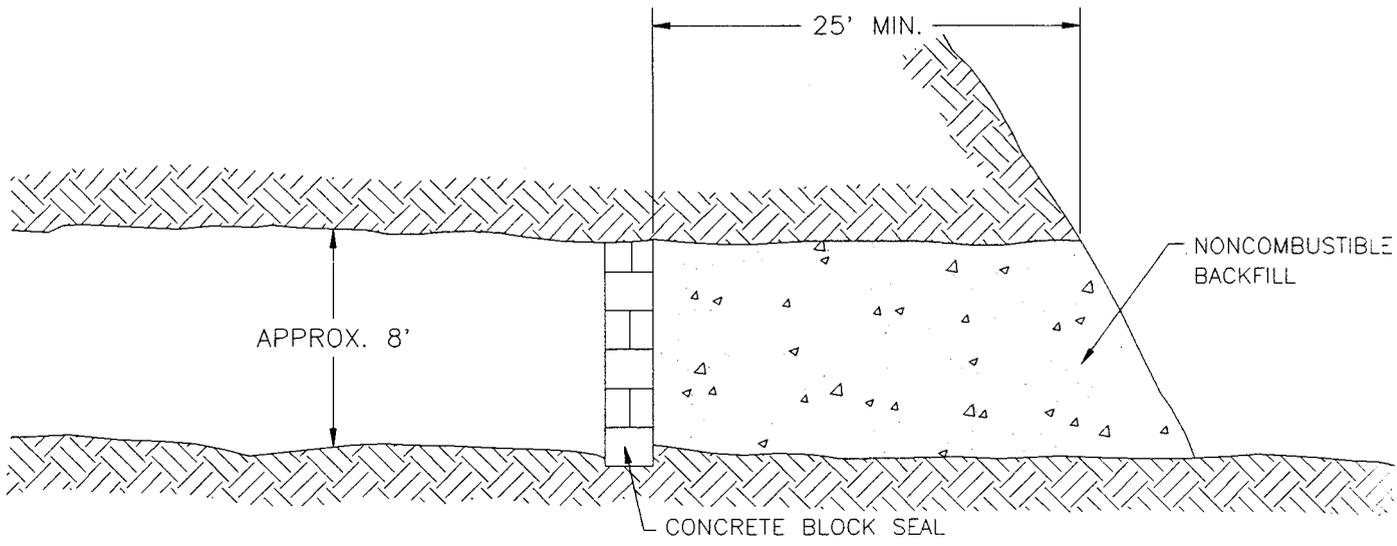
Upon completion of mining activities, all surface structures, will be removed, with the exception of portions of the culverts and the sediment pond as described in the following section. Salvageable materials will be hauled off-site to a temporary storage area for re-use or sale. Non-salvageable items will be removed to an approved land fill (i.e. - Emery County Dump). Concrete will be broken up by dozer or other equipment and either placed against the highwall prior to backfilling or hauled to an approved landfill.

3.5.3.3 DISPOSITION OF DAMS, PONDS AND DIVERSIONS

Due to the close proximity of the mine site to a perennial stream, it is proposed to leave the sediment pond in place to treat reclaimed area runoff until



PLAN VIEW



ELEVATION VIEW

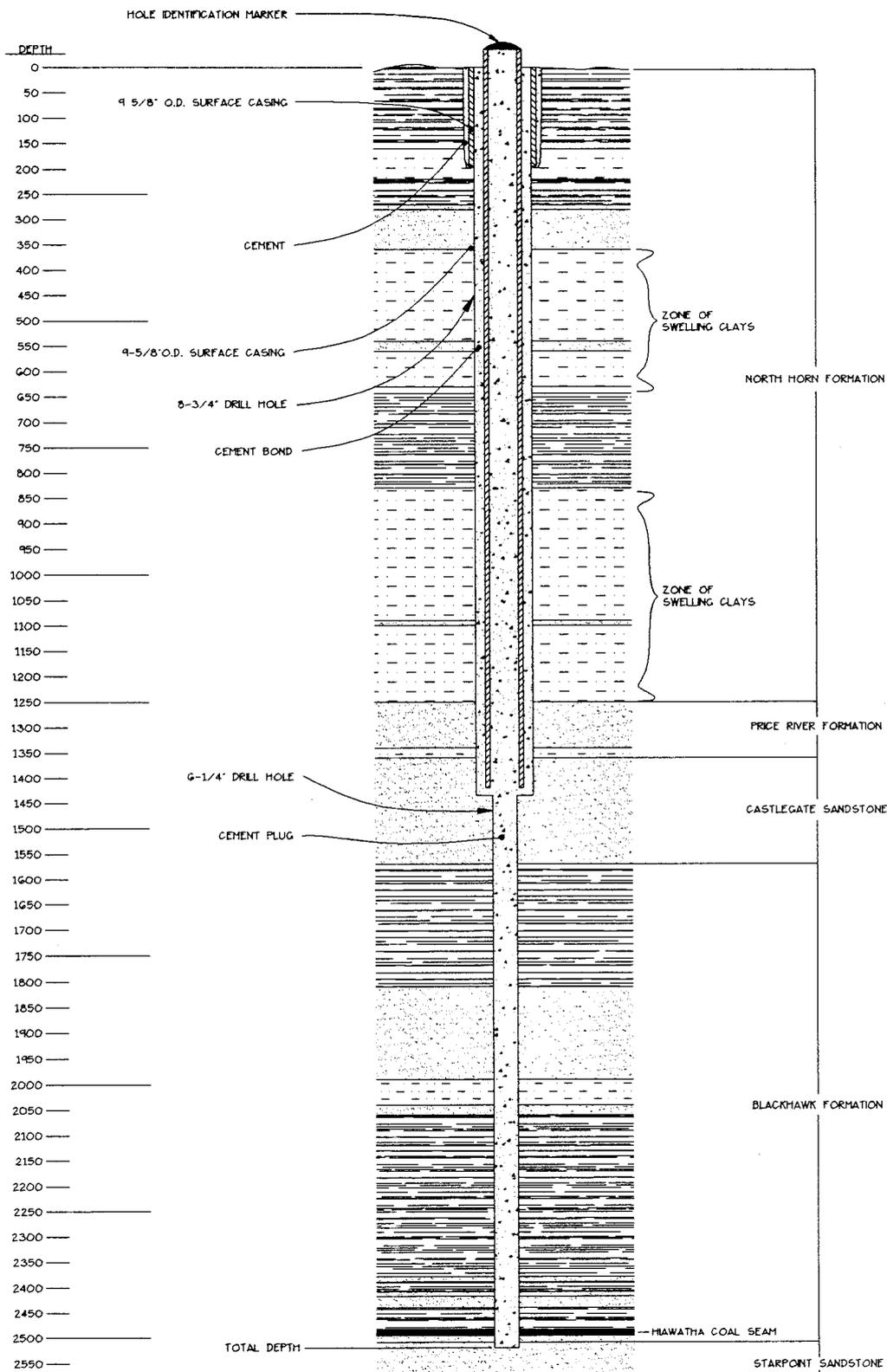
CAD FILE NAME/DISK#: PORSEAL

ENERGY WEST **3-58**
 MINING COMPANY **10/21/94**
 HUNTINGTON, UTAH 84528

*TRAIL MOUNTAIN MINE
 TYPICAL PORTAL SEAL*

DRAWN BY:	P.K.B.	FIGURE 3-7
SCALE:	NONE	
DATE:	OCT. 14, 1994	
		DRAWING #:
		SHEET <u>1</u> OF <u>1</u>
		REV. <u> </u>

TYPICAL CROSS SECTION
TRAIL MOUNTAIN DRILL HOLE SEALING



1"=100'
NONE
SCALE

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10/21/94

FIGURE 3-8

LEGEND

	SANDSTONE		COAL
	MUDSTONE		CEMENT
	INTERBEDS		

NO FILE NAME/NO. REVISION	
ENERGY WEST MINING COMPANY	
TRAIL MOUNTAIN MINE TYPICAL CROSS SECTION DRILL HOLE SEALING	
DATE BY: P. BOYLEY	TMS1502A
SCALE: AS NOTED	SHEET 2
DATE: OCT. 13, 1994	SHEET 1 OF 1

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revegetation standards are reached. To direct the runoff, a 40' length of 48" cmp will be left in place at the point where the restored side canyon drainage meets the restored main channel, as shown on Plate 3-5. The reclaimed area will be bermed along the restored side canyon drainage meets the restored main channel, as shown on Plate 3-12. The reclaimed area will be bermed along the restored banks of the channels, to direct runoff to the sediment pond. Approximately 300' of 66" culvert (with the 96" to 66" transition and trash rack) will be left in place beneath the pond to convey the undisturbed Cottonwood Canyon drainage. All other diversions and culverts will be removed during this Phase I of final reclamation. Once revegetation standards are reached, the sediment ponds and all remaining culvert sections will also be removed, and the remaining disturbed area will be reseeded. Additional sediment controls, such as straw bales, silt fences, berms, etc., will be placed as needed to ensure protection for the stream during this final phase of reclamation (Phase II).

3.5.4 BACKFILLING AND GRADING PLAN

The surface of this area was originally disturbed in the 1940's by a previous owner. The surface is all privately owned. Since no major effort was made at that time to save or store any topsoil or other material, restoration to approximately original contour is highly impractical. However, it is the intent of PacifiCorp to restore the area to a topography acceptable to the Division and compatible with the post-mining land use, using such materials that are available at the site.

In general, the backfilling and regrading will proceed as follows:

- a) After sealing of the portals and removal of all structures, a backhoe will be brought to the upper (portal road) terrace.

- b) The backhoe will begin by reaching down over the fill bank and retrieving as much material as can be reached. This material will be placed on the terrace.**
- c) A Cat will work with the backhoe where possible, taking the retrieved material and spreading and compacting it from the cut outward to reach a configuration as shown on Plate 3-5, Post-Mining Topography.**
- d) The mine yard will then be re-sloped to drain as shown. A rock-lined natural drainage will be restored in the main and side channels as previously described.**
- e) The reclaimed area will be left in a roughened condition by placement of material with the backhoe and subsequent ripping and/or tracking with the dozer. This will promote moisture retention on the site to enhance vegetation.**
- f) Available topsoil, from the storage pile, will be redistributed to a depth of 6", starting at the north end of the storage area, and continuing down as far as material is available.**
- g) Upon final shaping and preparation of an area, it will be reseeded as per the plan.**
- h) Soil sampling of the regraded surface will be conducted as per the program described in Appendix 9-1, Attachment C.**

3.5.4.1 CONTOURING

Plate 3-5 shows the post mining contours of the Trail Mountain Mine. Upon abandonment, the post mining land use will not require extensive backfilling or returning the land to the original contours, however, all areas which are compacted through the reclamation activities or during mining will be "deep-ripped" utilizing a dozer ripper to a depth of 12" to 24" prior to seeding.

The drainage channels will be graded to reestablish the streams, following removal of the bypass culverts. Attempts will be made to restore the channels to the pre-mining slopes and conditions.

3.5.4.2 REMOVAL OR REDUCTION OF HIGHWALLS

Highwalls will be reclaimed as is practicable for the site and for the post mining land use. A static factor of a least 1.3 will be developed in the reclaimed highwall.

It should be noted that highwalls, by definition, are only those cut areas associated with portals. Other cut areas exist on this site; however, these are primarily road or pad cuts and do not fit the definition of a highwall. Portions of these areas may be retained as terraces to enhance the stability of road backfills.

3.5.4.3 EROSION CONTROL

Measures for erosion control will be implemented on a case by case basis. Some methods which might be used are: mulching, straw dikes, water bars, silt fence, and limiting access to the area.

The berms along the reclaimed channels will be checked for erosion in the flow paths. If signs of erosion are evident, erosion controls such as loose rock check dams or silt fences will be installed along at intervals of 500' or less as necessary to control the erosion. Rills or gullies deeper than nine inches in regraded areas will be filled, graded or otherwise stabilized and reseeded as per the plan. This will be accomplished by hand, using adjacent or eroded material whenever possible. If larger gullies develop, a backhoe may be used in addition to hand work. Existing material that has been found satisfactory as a growth media through testing from the site will be used to accomplish this task.

3.5.5 REVEGETATION PLAN

The disturbed areas of the Trail Mountain mine will be revegetated the first normal period for favorable planting conditions after final site preparation. A suitable, diverse seed mix will be used to revegetate the disturbed area. Timing of the revegetation

within the mine reclamation schedule is shown in Section 3.5.6, Schedule of Reclamation.

Proposed seed mixes for the revegetation are listed in Appendix 9-1 of the MRP.

The method of revegetation will be largely determined by the results of the revegetation test plots. Those test plot methods that yield the best results will be used on the full scale reclamation of the mine site.

3.5.5.1 SOIL PREPARATION

With special handling, the disturbed land fill should provide a suitable seed bed for revegetation. Soil sampling will be conducted per Appendix 9-1, Attachment C. Special handling will include removal of contaminated material and large coarse rock fragments (greater than 18 inches). The large rock fragments will be used as rip-rap in channel restoration, buried with the fill, or randomly placed on the reclaimed surface. The mine coal pad areas will be removed and all coal/refuse associated with the pads will be hauled to the Cottonwood Waste Rock Site for disposal.

Contaminated soil material which contains greater than 50 percent coal fines, will be disposed of at the Cottonwood Waste Rock Site. Soil contaminated with oil and grease will be disposed of at an approved site. This will be determined by visual inspection, and any material with visible oil or grease contamination will be removed. The volume of such material cannot be accurately estimated; however, it will likely be less than two percent of total volume. Material with less than 50 percent coal fines will be buried against the cut banks and covered with a minimum of four feet of incombustible material. There are no acid-or toxic-forming materials known to exist at this site. Any of these materials discovered will be disposed of on-site and covered with 4' of material or removed to the Cottonwood Waste Rock Site. Salt contamination may also be a problem in soils used for reclamation.

3.5.5.1 SOIL PREPARATION PLAN (continued)

If visible salty areas or analyzed salty areas are found, the soils will be buried along the cut banks or other available sites to a minimum depth of 48".

Non-coal waste will be separated from the soils, loaded into trucks and hauled to an approved landfill for final disposal. All pad areas will be ripped for 12 to 24 inches to loosen the fill profile using the rippers on the dozer, and pulverized if a cloddy surface exists. Once backfilled and graded, the surface will be scarified with the teeth on the backhoe, or using the tracks of the dozer to create "pockets" for water retention and root penetration. Soil samples will be taken to identify the need for replenishment of various soil nutrients, as described in Appendix 9-1, Attachment C.

3.5.5.2 SEEDING AND TRANSPLANTING

Information from the test plots has been utilized together with proven reclamation results in order to arrive at the best treatment and seeding methods. After regrading and top soiling, the disturbed area will be mulched, fertilized and seeded. The steeper areas will be hydroseeded, and areas flat enough to safely allow operation of a drill seeder will be drill seeded. Regraded areas will not be smooth, but will have numerous depressions that will hold moisture and provide a micro-climate for vegetation establishment.

Riparian Community - During reclamation, the culverts will be removed, and the stream channels will be restored. The main channel will be rip-rapped with a 1.4 foot median rock size at least 4 feet above the stream. The flatter, reclaimed area is expected to be 60-70 feet west of the stream bank, and 20-40 feet east to where the public road will remain. Most of this area will consist of a slope of 5-10 degrees; therefore, drill-seeding will be used.

The riparian seed mix (see Table A9-3, Appendix 9-1) will be used approximately 20-40 feet on each side of the rip-rap, leaving a total floodplain area of 50-60 feet.

Grassland - Shrub Community - The seed mix for the grassland - shrub community will be used on the entire mine site, with the exception of the riparian area described above. See Table A9-1, Appendix 9-1 for seed mix and application rates. Portions of the grassland - shrub community area may be flat enough to safely utilize a drill-seeder; however, the majority of this area will be on the steeper slopes and will thus be hydro-seeded.

Containerized Stock - Following the seeding and mulching containerized woody plant species will be planted at a rate of 90 individuals/acre (or 2% of the undisturbed density in equal proportions). Wherever possible, this stock will be spatially arranged in clumps to maximize cover for wildlife. It is recommended (R645-301-358) that "edge effect" be optimized in support of resident wildlife species. Significant stands of coniferous plant cover (Pinion-Juniper and Douglas Fir) exist throughout the permit area. These stands occur well within the limits of maximum distances required to optimize edge effect. A diagram illustrating the general spatial arrangement of the grassland - shrub community is included in Appendix 9-1, along with the description of the containerized stock proposed for both grassland-shrub and riparian areas.

One proposed option is that fresh-cut willow shoots be used on the riparian area in lieu of containerized stock. These shoots would be cut from local sources along Cottonwood Creek and placed on 3' centers on each side of the reclaimed channels.

3.5.5.2.1 SEED MIX AND RATE/ACRE

Two seed mixes are proposed for reclamation of the two vegetative communities that existed on the disturbed site. The first seed mix is for the riparian community, the second is for the grassland-shrub community. Lists of the species for both seed mixes can be found in Appendix 9-1.

3.5.5.3 MANAGEMENT

The reclaimed area will be protected from livestock grazing until bond release by fencing. The proposed fence is shown on Figure 3-9, and is not intended to preclude wildlife access. The revegetated area will be observed on a yearly basis. If heavy use occurs by wildlife, rodents, etc. other protection measures may be considered.

3.5.5.4 VEGETATIVE MONITORING

Vegetation monitoring for permanent reclamation will be conducted as indicated in Table 3-2.

Revegetation success at the Mine will be based on comparison with the approved reference areas. Ground cover, woody plant density, and shall be considered equal to their respective reference area counterparts, when there is 90 percent success at 90% statistical confidence.

3.5.6 SCHEDULE OF RECLAMATION

3.5.6.1 DETAILED TIMETABLE FOR COMPLETION OF EACH MAJOR STEP IN RECLAMATION (See Table 3-3).

3.5.6.2 RECLAMATION MONITORING

Monitoring of the success of reclamation will encompass subsidence, revegetation and water quality and quantity monitoring.

Mine Reclamation
Fencing Typical
Scale 1"-2' 11/30/89 D.G.

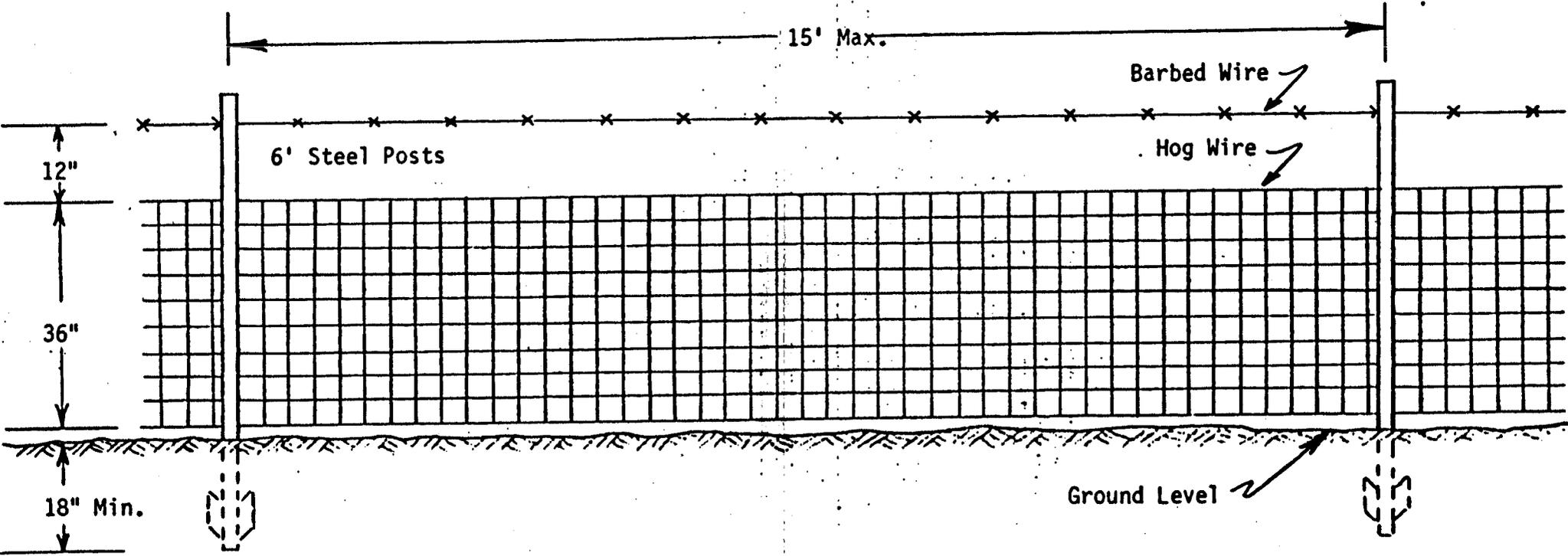


FIGURE 3-9

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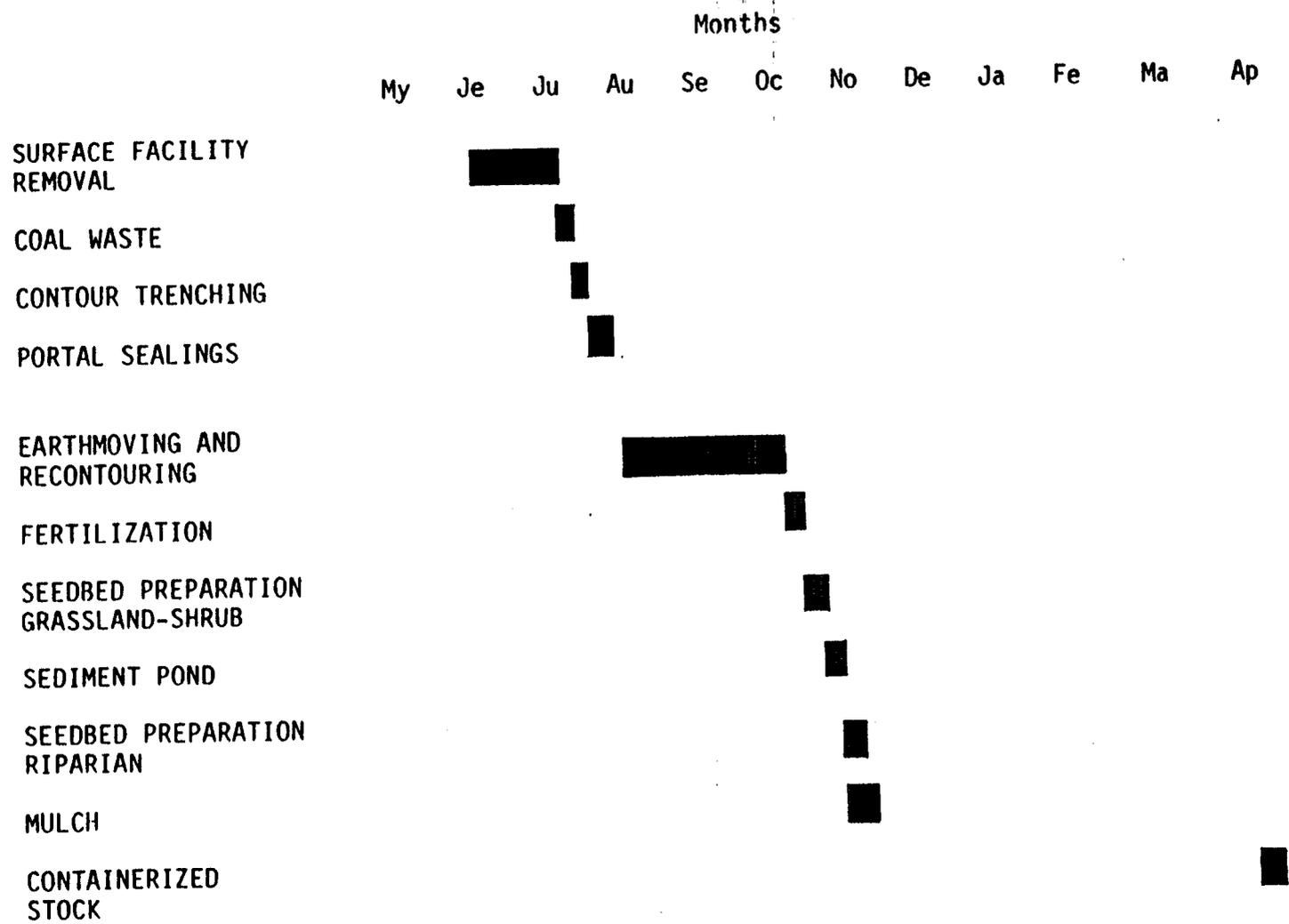
Table 3-2

TRAIL MOUNTAIN MINE FINAL RECLAMATION MONITORING

TEN YEAR RESPONSIBILITY PERIOD		1st YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR	6th YEAR	7th YEAR	8th YEAR	9th YEAR	10th YEAR
QUALITATIVE OBSERVATIONS											
	SPRING SITE VISIT		█	█	█	█	█	█	█	█	█
	FALL SITE VISIT		█	█	█	█	█	█	█	█	█
QUANTITATIVE OBSERVATIONS											
	COVER		█	█		█				█	█
	FREQUENCY		█	█		█				█	█
	WOODY PLANT DENSITY		█	█		█				█	█
	PRODUCTIVITY									█	█

Table 3-3 Typical Reclamation schedule for the Trail Mountain Mine. Categorical correspond to the "Revegetation Plan" (see text) and the "Bonding Estimate" (see Table

RECLAMATION TIMETABLE



Note: Months are shown for reference only. Actual start and finish date may vary however, revegetation will take place in the fall.

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- **Annual surveys will be conducted to determine surface deformation due to subsidence and possible movement of surface subsidence monuments.**
- **Water Quality and quantity monitoring will continue until reclamation has been accomplished as approved by the regulatory authority.**
- **All seeded areas will be inventoried to determine success of seeding.**

3.5.7 COST ESTIMATE FOR RECLAMATION

The 1979 Act "Regulation of Coal Mining and Reclamation Operations" requires the operator of a coal mine to file with the Utah Division of Oil, Gas and Mining (DOG M) a bond in the amount equal to the estimated cost of completing the work described in the operator's reclamation plan. The bond is to ensure the State of Utah that in the event of the operator being financially unable to reclaim the disturbed areas, such areas can and will be restored by the DOGM at no cost to state residents.

The strata characteristics above the coal seam, the slow and uniform rate of subsidence will not affect the surface terrain to such an extent that reclamation will be necessary. As such, a reclamation bond is not required for the surface lands over the underground workings.

An estimate of the cost of reclamation of the Trail Mountain Mine site is shown on the following pages, in Table 3-4. This table reflects the required bond increase from all additions. Supporting cost calculations for each major reclamation step is also presented. The amount of the bond posted for this operation is broken down on the final page in Table 3-5.

Earthwork estimates for final reclamation are summarized in the Mass Balance Table 3-6. The quantities are taken from cross-sectional areas shown on Plate 3-6. Cross section locations are shown on Plates 3-1 and 3-5. Estimates indicate a cut volume of 38,579 cubic yards and a required fill volume of 39,719 cubic yards for final mine site reclamation.

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**SURETY BOND ESTIMATE
TABLE 3-4**

<u>ITEM</u>	<u>AMOUNT LABOR MAN/SHIFT^{1,8}</u>	<u>COST/MAN SHIFT</u>	<u>LABOR COST</u>	<u>EQUIPMENT³ REQUIREMENTS</u>	<u>MATERIAL⁴ EQUIPMENT SHIFT/COST⁵</u>	<u>MATERIALS EQUIPMENT TOTAL COST</u>	<u>TOTAL LABOR MATERIALS EQUIPMENT¹¹</u>
SURFACE FACILITY REMOVAL							
Substation	1/3	160	480	Truck	3/250 ⁽¹³⁾	750	1230
and	1/3	160	480	Crane	3/381	1143	1623
Powerline	2/3	120	720	None			720
Office/Shop	1/10	160	1600	Truck	10/250	2500	4100
/Bathhouse	1/10	160	1600	Backhoe/Loader	10/225	2250	3850
	2/5	120	1200	None			1200
Water and	1/4	160	640	Truck	4/250	1000	1640
Fuel System	1/4	160	640	Backhoe/Loader	2/225	450	1090
	1/4	120	480	None			480
Sewer System	1/1	120	120	Pump and Plug	1/100	100	220
Generator	1/1	160	160	Truck	1/250	250	410
House	1/1	160	160	Backhoe/Loader	1/225	225	385
	1/1	120	120	None			120
Storage	1/3	160	480	Truck	3/250	750	1230
Building	1/3	160	480	Backhoe/Loader	3/225	675	1155
	2/3	120	720	None			720

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**SURETY BOND ESTIMATE
TABLE 3-4**

<u>ITEM</u>	<u>AMOUNT LABOR MAN/SHIFT^{1,8}</u>	<u>COST/MAN SHIFT</u>	<u>LABOR COST</u>	<u>EQUIPMENT³ REQUIREMENTS</u>	<u>MATERIAL⁴ EQUIPMENT SHIFT/COST⁵</u>	<u>MATERIALS EQUIPMENT TOTAL COST</u>	<u>TOTAL LABOR MATERIALS EQUIPMENT¹¹</u>
Bin	1/15	160	2400	Truck	15/250	3750	6150
	1/15	160	2400	Crane	15/381	5715	8115
	2/15	120	3600	None			3600
Chute	1/3	160	480	Truck	3/250	750	1230
	1/3	160	480	Crane	3/381	1143	1623
	1/3	120	360	None	-	-	360
Main Fan	1/7	160	1120	Truck	7/250	1750	2870
	1/4	160	640	Crane	4/381	1524	2164
	1/2	160	320	Backhoe/Loader	2/250	500	820
Scale and Scale House	1/2	160	320	Truck	2/250	500	820
	1/2	160	320	Backhoe/loader	2/225	450	770
	2/2	120	480	None	-	-	480
Storage Shed	3/1	160	480	Backhoe/loader	1/250	250	730
Loading Dock	1/1	160	160	Backhoe/loader	1/250	250	410
Pump House/ Water Tank	1/1	160	160	Truck	1/250	250	410
	1/1	160	160	Crane	1/381	381	541
	3/1	120	360	None	-	-	360

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SURETY BOND ESTIMATE
TABLE 3-4

<u>ITEM</u>	<u>AMOUNT LABOR MAN/SHIFT^{1,8}</u>	<u>COST/MAN SHIFT</u>	<u>LABOR COST</u>	<u>EQUIPMENT³ REQUIREMENTS</u>	<u>MATERIAL⁴ EQUIPMENT SHIFT/COST⁵</u>	<u>MATERIALS EQUIPMENT TOTAL COST</u>	<u>TOTAL LABOR MATERIALS EQUIPMENT¹¹</u>
ROM							
Transfer							
Operator	2/2	127	508	25 ton crane	2/297	594	
				truck/trailer	2/267	534	
Laborer	2/3	123	738	2 yd.hyd.	.5/424	212	
				Excav.	.5/293	147	
Foreman	1/3	137	411	2.5 yd loader	1/227	227	
				16 tn dump	3/40	120	3491
				truck			
				torch, gas &			
				air			
Tipple							
Elec.							
Facility							
Operator	3/2	127	762	25 ton crane	.75/297	223	
				truck/trailer	.75/267	200	
Laborer	1/2	123	246	2 yd.hyd.	1/424	424	
				excav.	1/293	293	
Foreman	1/2	137	274	2.5 yd. loader	1/227	227	
				16 tn dump	2/40	80	2729
				truck			
				torch, gas &			
				air			

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**SURETY BOND ESTIMATE
TABLE 3-4**

<u>ITEM</u>	<u>AMOUNT LABOR MAN/SHIFT^{1,8}</u>	<u>COST/MAN SHIFT</u>	<u>LABOR COST</u>	<u>EQUIPMENT³ REQUIREMENTS</u>	<u>MATERIAL⁴ EQUIPMENT SHIFT/COST⁵</u>	<u>MATERIALS EQUIPMENT TOTAL COST</u>	<u>TOTAL LABOR MATERIALS EQUIPMENT¹¹</u>
ROM Overland Tube Conveyor (Tube Removal)							
Operator	2/2	127	508	80 ton crane	1.5/864	1296	4865
				25 ton crane	2/297	594	
Laborer	3/2	123	738	utility truck	2/70	140	
				tractor/flatbed	2/260	520	
Foreman	1/2	137	274				
(Supports & Footers)							
Operator	3/.5	127	190	245 hyd. excavator	.5/567	283	
Laborer	1/.5	123	61	10 yd dump truck	1/226 .5/70	226 35	
				utility truck			
Conveyor Structure	1/5	160	800	Truck	5/250	1250	2050
	1/5	160	800	Crane	5/381	1905	2705
	1/5	120	600	None	-	-	600
Loading Dock	1/.5	160	80	Truck	.5/250	125	205
	1/.5	160	80	Loader	.5/225	113	193
Coal Pile	1/.5	160	80	Jeffrey	.5/500	250	330
	1/.5	160	80	Dozer	.5/703	352	432

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**SURETY BOND ESTIMATE
TABLE 3-4**

<u>ITEM</u>	<u>AMOUNT LABOR MAN/SHIFT^{1,8}</u>	<u>COST/MAN SHIFT</u>	<u>LABOR COST</u>	<u>EQUIPMENT³ REQUIREMENTS</u>	<u>MATERIAL⁴ EQUIPMENT SHIFT/COST⁵</u>	<u>MATERIALS EQUIPMENT TOTAL COST</u>	<u>TOTAL LABOR MATERIALS EQUIPMENT¹¹</u>
Sediment Pond	1/2	160	320	Jeffrey	2/500	1000	1320
	1/2	160	320	Loader	2/225	450	770
Seal Portals	3/10	120	3600	Concrete Block	5/1000	5000	8600
Explosive Magazine	1/2	120	240	Concrete Block	2/500	1000	1240
Culverts	1/20	160	3200	Truck	20/250	5000	8200
	1/20	160	3200	Crane	20/381	7620	10820
	2/20	120	4800	None	-	-	4800
Trash Removal	1/2	120	240	Truck	1/250	250	<u>490</u>
						SUBTOTAL	\$105,466
Earth Moving and Recontouring (10,12)	1/25(14,17)	160	4000	Dozer	25/703	17575	21575
	1/62(15)	160	9920	988 Loader	62/971	60202	70122
	1/15(16)	160	2400	Track Excavator	15/954	14310	<u>16710</u>
						SUBTOTAL	\$108,407
Riprap(19)	1/12	160	1920	Truck	12/250	3000	4920
	1/12	160	1920	Backhoe/loader	12/225	2700	4620
	1/12	120	1440	None	-	-	<u>1440</u>
						Subtotal	\$10,980

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**SURETY BOND ESTIMATE
TABLE 3-4**

<u>ITEM</u>	<u>AMOUNT LABOR MAN/SHIFT^{1,8}</u>	<u>COST/MAN SHIFT</u>	<u>LABOR COST</u>	<u>EQUIPMENT³ REQUIREMENTS</u>	<u>MATERIAL⁴ EQUIPMENT SHIFT/COST⁵</u>	<u>MATERIALS EQUIPMENT TOTAL COST</u>	<u>TOTAL LABOR MATERIALS EQUIPMENT¹¹</u>
REVEGETATION							
Fertilization	1/4	160	640	Dozer Spreader Fertilizer	4/703 4/55 10.0*/@30 acre	2812 220 300	3452 220 300
Seedbed Preparation ^C(Grassland- Shrub)	1/4	160	640	Dozer Spreader Seed Land Imprinter	4/703 2/55 7.0*/@388 acre 2/200	2812 110 2716 400	3452 110 2716 400
Seedbed Preparation (Riparian)	1/3	160	480	Dozer Spreader Fertilizer Disk Harrow Seed	3/703 1/55 1/55 1/55 1/55 3*/@236 acre	2109 55 55 55 55 708	2589 55 55 55 55 708
Contour Trenching	1/5	160	800	Dozer	5/703	3515	4315
Mulch	10/21	120	25200	Erosion Mat	10.0*/1100 acre	11000	36200

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**SURETY BOND ESTIMATE
TABLE 3-4**

<u>ITEM</u>	<u>AMOUNT LABOR MAN/SHIFT^{1,8}</u>	<u>COST/MAN SHIFT</u>	<u>LABOR COST</u>	<u>EQUIPMENT³ REQUIREMENTS</u>	<u>MATERIAL⁴ EQUIPMENT SHIFT/COST⁵</u>	<u>MATERIALS EQUIPMENT TOTAL COST</u>	<u>TOTAL LABOR MATERIALS EQUIPMENT¹¹</u>
Containerized	2/3	120	720	Plant Materials	--	694	<u>1414</u>
						SUBTOTAL	56,096
MICELLANEOUS							
Handtools	N/A (7)	N/A	N/A	Cutting Torch, etc	2000	2000	2000
Soil Analyses (Pregrade)	N/A (18)	N/A	N/A	Handtools, Backhoe	600	600	600
Soil Analyses (Postgrade)	N/A	N/A	N/A	Handtools, Bags	920	920	920
Supervision (8)	1/122	200	24400	N/A	N/A	N/A	24400
Mobilization	N/A	N/A	N/A	Misc. Equipment	2000	2000	2000
Monitoring, Maintenance	1/10 yr	200	40000	See Handtools	1000	1000	<u>41000</u>
SUBTOTAL							\$70920
TOTAL							\$313,818

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REFERENCE FOR BOND ESTIMATE TABLE

1. Based on 8 hour shifts, overhead included.
2. Cost estimates form: Means 1984 Cost Construction Data. 1983. 42nd Annual Edition. Robert Snow Means Company, Inc., 100 Construction Plaza, Kingston, MA 02364.
3. For description fo the quipment listed, refer to Table 1.
4. For a description of plant materials, refer to text.
5. Cost estimates from: Rental Rate Blue Book Construction Equipment. 1983. Dataquest Inc., San Jose, Calif. Equipment rates include operation and maintenance costs.
6. Daily charge based on weekly rental rate of all equipment except dump, dozer and front loader (which were based on monthly rates). All rates include operation and maintenance costs.
7. N/A designates "non-applicable". Labor costs for these items were included in previous crew charges.
8. Estimate based on 4-man working crew and 8-hour shifts. Laborer = \$15/hr., Equip Operator +\$20/hr.
9. Farm implements prices based on Swains John Deere Farm Equipment, Salt Lake City, UT.
10. For cut and fill quantities, calculation and cross-sections, refer to text.
11. Cost estimates assume no salvageable value of surface structures and facilities.
12. Earthmoving and recontouring estimates also include material haulage.
13. Example: $3/280 = 3$ shifts @ \$250/shift.

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- 14.* Number of shifts based on 12,000 yds' to be moved at production rate of 98 yds/hr determined from maximum production rate of 410 yds/hr, corrected by .42 for 30% working slope, corrected by .75 for average operator efficiency, corrected by .83 for 50 min. hour, corrected by .90 for moderately hard to drift material.
- 15.* Number of shifts based on 24,000 yds' to be moved at production rate of 2,000 yds'/shift (6 hrs. production, 2 hrs. move time/shift) determined from maximum production rate of 420 yds/hr with 2 cycles/min. corrected for 50 min. hour, assuming average operator efficiency and medium digging difficulty.
- *Production rates above are somewhat conservative to allow for estimated 10 to 15 percent swell factor and occasional large rock.
17. Estimates include backfilling portal entrances.
18. Labor and equipment costs for soil sampling are included under "Monitoring and Maintenance". Equipment used for soil sampling may also be necessary for rills and gullies and other maintenance procedures, therefore equipment will be available.
19. Additional riprapping costs were included in Item "Culverts".

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**TABLE 3-5
RECLAMATION COST BREAKDOWN FOR RECLAMATION BOND**

1.	Surface Facility Removal	\$105,466
2.	Earth Moving and Recontouring	108,407
3.	Rip-Rap	10,980
4.	Revegetation	56,096
5.	Miscellaneous*	<u>70,920</u>
	SUBTOTAL (1984 Dollars)	\$351,869
	+10% Contingency	<u>35,187</u>
	SUBTOTAL	\$387,056
	+5.1% Reclamation Management	<u>9,740</u>
	TOTAL	\$406,796
	Add an inflation factor of 6.78 percent over 5 year Permit Term	<u>157,921</u>
	SUBTOTAL	\$564,717

<u>YEAR</u>	<u>ESCALATION FACTOR***</u>	<u>ESCALATED TOTAL</u>	<u>YEAR</u>	<u>ESCALATION FACTOR</u>	<u>ESCALATED TOTAL</u>
1989	--	\$564,717	1990	0.77%	\$569,065
1991	1.27%	\$576,292	1992	2.21%	\$589,028
1993	2.54%	\$603,989	1994	2.01%	\$616,130
1995	2.01%	\$628,514	1996	2.01%	\$641,147
1997	2.01%	\$654,034	1998	2.01%	\$667,180
1999	2.01%	\$680,591			

TOTAL SURETY ESTIMATE (1999 Dollars)	\$680,591
**1993 Exploration Drilling	<u>144,266</u>
SUGGESTED SURETY ESTIMATE	\$824,857

*Miscellaneous costs include all monitoring and maintenance related costs for successful reclamation establishments.

**Total includes +10% Contingency = 12,622 and +4.3 Reclamation Management = 5,427. Original Cost 1994 Dollars = 126,217.

***Escalation Factors taken from Means©

TABLE 3-6
MASS BALANCE

STATION	CUT VOLUME CU. YDS.	FILL VOLUME CU. YDS.	ACC. CUT VOLUME CU. YDS.	ACC. FILL VOLUME CU. YDS.
0+00	0	0	0	0
2+00	1,556	1,467	1,556	1,467
4+00	3,778	3,022	5,334	4,489
6+00	4,889	4,519	10,223	9,008
8+00	6,222	6,148	16,445	15,156
10+00	5,511	5,482	21,956	20,638
12+00	4,341	3,259	26,297	23,897
14+00	3,719	3,170	30,016	27,067
16+00	2,533	3,926	32,549	30,993
18+00	3,185	3,511	35,734	34,504
20+00	2,415	2,400	38,149	36,904
22+00	430	1,200	38,579	38,104
24+00	0	1,274	38,579	39,378
25+00	0	341	38,579	39,719
TOTALS	38,579	39,719	38,579	39,719

NOTES: (1) Refer to Plates 3-1 and 3-5 for cross sections (2) Refer to Plate 3-6 for cross section