

affected by mining activities, additional steps will be taken to rectify the situation in consultation with state and federal regulatory agencies.

3.5.3.6 Surface Water Monitoring Plan

An ongoing hydrologic monitoring program will be conducted if in the event they are deemed necessary.

As required, water quality data collected from surface water monitoring stations will be submitted within 60 days of the end of each quarter, depending upon the speed of the laboratory analyses.

3.5.4 Preservation of Soil Resources

Co-op Mining Company is prepared to meet the requirements specified by 30 CFR 784.15. Backfilling, soil stabilization, compacting, grading and any other necessary operations will be performed when necessary with the best technology available, as approved by the regulatory agency. Section 3.6, Reclamation Plan, provides a detailed discussion

of the reclamation effort.

3.5.4.1 Projected Impacts of Mining
on Soil Resources

Since the Bear Canyon Mine is an underground mine at the site of an old works, the overall impact of mining on soils will be minor. The impacts of surface operations and mining facilities on soil resources consist of coverage of soil by facilities, disturbance of soils during construction activities, erosion created by removing vegetation, reduced forage growth due to nutrient degradation, reduced wildlife capacity and particulate emissions to the air. However, the abandoned mine had large accumulations of debris which has now been cleaned up, which to a large degree constitutes enhancement.

3.5.4.2 Control Measures to Mitigate
Impacts

The objective of the proposed backfilling,

soil stabilizing, compacting, contouring and grading process is to create a reclaimed surface that provides a variety of topographic features to enhance postmining land use.

Section 4.5.1, Postmining Land Use, and Section 3.6, Reclamation earthwork activities to be conducted. This section summarizes the steps to be taken in the backfill, soil stabilization, compaction, contouring and grading program.

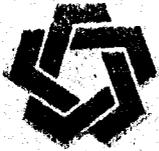
Topsoil Removal and Protection

Before any new construction or mining activity that will disturb the surface of native undisturbed areas, topsoil will be removed from the affected area after vegetation has been removed. The topsoil will be segregated from any other material removed and stockpiled separately in a stable site within the permit area protected from erosion, compaction, or contamination. The stockpile will be stabilized by seeding.

As soon as operations are concluded in each disturbed area, the removed topsoil will be redistributed on the site in the manner required. Methods and techniques are detailed in Section 3.6.4.4, Soil Redistribution and Stabilization. (See Appendix 3-D Approved topsoil handling plan)

Backfill, Compaction and Grading

To the maximum extent practicable, disturbed surface areas will be backfilled, compacted and graded according to the approved time schedule. The purpose of these operations is to return disturbed areas to approximate original makeup and contour. Wherever possible, backfilling will return the various soil horizons to their original site and make them compatible with surrounding areas. Compaction will help the returned soils remain in place. Grading will restore the contour to as near the original state as possible; however, because of local conditions, large-scale backfilling, compaction and grading will not be possible in many areas.



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dr. G. A. (Jim) Shirazi, Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801 533 5771

August 17, 1983

Mr. Wendell J. Owen
Co-op Mining Company
P. O. Box 1245
Huntington, Utah 84528

RE: Approval for Consolidation of
Topsoil Stockpiles
Bear Creek Canyon Mine
ACT/015/025, Folder Nos. 4 & 7
Emery County, Utah

Dear Mr. Owen:

Following is the approval of the proposed plan for consolidation of the several topsoil stockpiles located at Bear Canyon. The approval lists the deadlines for completing the work and a change in the recommended seed mix.

Please be aware that failure to meet these deadlines will subject Co-op to a violation for failure to operate in accordance with an approved plan.

Division approval is hereby granted to consolidate the topsoil piles in Bear Creek Canyon and provide accurate topsoil volume calculations by August 31, 1983 as proposed in Co-op Mining Company's June 24, 1983 submittal. Approval to implement protection measures of topsoil stockpiles is granted with the exception of utilizing the seed mix proposed. The use of the seed mix listed in Attachment 2-A is not recommended for topsoil pile protection as the shrubs included, given 20-40 years of growth, would in all likelihood cause problems in the topsoil redistribution process. It is suggested that Co-op utilize an appropriate seed mix for topsoil protection which does not contain shrubs.

Since fall seeding would produce the most optimal success in germination and establishment of a vegetative cover, seeding may occur as late as October 14, 1983.

Since this mine produces no acid-forming or toxic-forming materials, backfilling required to cover such materials will be unnecessary. (See Laboratory test Appendix 3E)

Physical and Chemical Soil Stabilization

Soils will be stabilized by physical and chemical methods before planting. This may include placement of crushed heavy material at the toe of roadfill slopes, for example. Other approved and proven methods will be employed as necessary. Chemical stabilization may include the addition of neutralizing chemicals to soils shown to be excessively acidic or basic. Nutrients and soil amendments will be added in the amounts indicated by soil tests to assure that the surface soil layer can sustain the approved postmining land use.

Biological Soil Stabilization

Returned soils will be stabilized bio-

logically by revegetation of disturbed areas. This stabilization effect will be accomplished by the holding capacity of the root systems of the new vegetative cover, particularly small shrubs and trees. This aspect of soil stabilization will begin as soon as topsoil is redistributed. Section 3.6.5, Revegetation Plan, provides specific detail on this aspect of the reclamation plant.

3.5.5 Protection of Vegetative Resources

Co-op Mining Company has maintained a commitment to reclaim the unused disturbed areas to the extent of the cover of the natural vegetation on the mine plan area. Chapter 9, Vegetative Resources, provides a preliminary report on the vegetative resources of the area.

3.5.5.1 Projected Impacts of Mining on Vegetative Resources

Since the Bear Canyon Mine is an under-

ground mine, the overall impact on surface vegetation is minor. The effects of surface operations on vegetative resources consist of removal of vegetation from new construction areas, on-site erosion and reduction of desirable plant species, which will reduce forage production and wildlife capacity.

3.5.5.2 Mitigating Measures to be
Employed to Reduce Impacts
on Vegetative Resources

All disturbed areas will be planted and revegetated during the first appropriate season following grading and redistribution of topsoil. This program will include any necessary addition of remedial treatments to the soil. A suitable, permanent and diverse vegetative cover selected on the basis of appropriate land management agency requirements will be established on all reclaimed areas. The schedule of the program is presented in

Section 3.6.6 What follows is an outline of the major aspects of the revegetation plan. The specific measures involved will be addressed on a site specific basis.

Seeding and Planting

All plants used to revegetate the disturbed areas will be native or compatible species selected specifically for the vegetative community, as detailed in Section 9.3.2. The choice of dominant species will be determined by suitability for post-mine land use. Seed types will include wheatgrass, salina wildrye, sagebrush, pinyon and juniper. Wherever possible, seed will be drilled or disced into the ground. In steep slope areas, where such techniques are difficult or impossible, hydro-seedings or cyclone spreader seeding will be done.

Native shrubs will be used for shrub re-planting. These will be potted seedlings, if available. Bare-root trees will be

used to some extent.

Mulching and Moisture Retention

As required, all regraded and retopsoiled areas will be mulched or otherwise treated to promote germination of seeds and to retain moisture. Various moisture-retention products are available.

Maintenance

Should such procedures prove necessary to the success of the revegetation plan, protection of replanted areas from animals may be carried out. Such procedures, however, are unlikely to be needed because the species to be selected should not require continuous or considerable maintenance beyond replanting.

3.5.5.3 Monitoring Procedures

All revegetated areas will be monitored closely for at least 5 years after revegetation. Any maintenance indicated by the results of these inspections will be

carried out promptly.

Vegetation will be measured yearly on all revegetated plots for at least the first 5 years. If success is achieved, further measurements will be made at 5-year intervals. Any area not achieving success will be re-evaluated and revegetated again in light of the most recent findings.

3.5.6 Protection of Fish and Wildlife

Wildlife is present in the mine plan permit area. Due to the size of the total disturbance impacts on the various mammal, amphibian and reptile species should be minimal. In addition, Co-op Mining Company is committed to mitigating as much as possible the adverse effects of all new construction and maintaining the natural abundance and diversity of the area.

3.5.6.1 Projected Impacts of Mining on Fish and Wildlife

Mammals

The Bear Canyon Mine plan area is inhabited by 84 species of mammals, of which 25 species are considered of high interest and 14 of these are protected by state or federal law (see Table 10-1).

Elk that are thought by the Utah Division of Wildlife Resources (UDWR) to be stable and productive use portions of the mine plan area at various times of the year for such necessary activities as wintering and feeding. This use, however, is marginal and not crucial. The minimal disturbance caused by planned surface facilities will have no significant impact on the herd.

Mule deer utilize the whole permit area, taking advantage of various habitat at different times of the year. Browse in the wintering range within the permit area is in good shape and should facili-

Mammals

The Bear Canyon Mine plan area is inhabited by 53 species of mammals, of which 19 species are considered of high interest and 14 of these are protected by state or federal law (see Table 10-1).

Elk that are thought by the Utah Division of Wildlife Resources (UDWR) to be stable and productive use portions of the mine plan area at various times of the year for such necessary activities as wintering and feeding. This use, however, is marginal and not crucial. The minimal disturbance caused by planned surface facilities will have no significant impact on the herd.

Mule deer utilize the whole permit area, taking advantage of various habitat at different times of the year. Browse in the wintering range within the permit area is in good shape and should facili-

tate over-wintering of the herd. Projected impact from proposed surface operations is expected to be minimal. The range of cougars in the permit area is determined by the migration patterns of mule deer and by human disturbance. Since the cougar population is low and since their range is far greater than the areas of proposed construction, mining activities will have little impact on the species.

Black bear may inhabit the permit area but the area is small compared to the overall habitat area. Black bears are not numerous, nor are they likely to be disturbed during the most sensitive times of their annual cycle. Impact will be minor at most.

Cottontail rabbits are likely to be affected only by subsidence, which will be limited to relatively small areas thus causing little negative impact. Disturbance to vegetation resulting in

seral succession will actually improve the reproduction potential of the rabbits.

Impact on snowshoe hares will be minor since the species's habitat in conifer-aspen stands is limited in the permit area.

Furbearers using underground burrows may be affected by subsidence within limited portions of the permit area. However, such effects will be temporary and the species are widespread and adaptable to human activity. Long-term impact will be minimal.

Mining activity will have little effect on the habitat of small mammals. Subsidence damage to burrows could increase mortality and reduce reproductive success temporarily, but the effect would be temporary because of the continued survival of the breeding population in

contiguous areas and to the high densities of these species.

Birds

The list of bird species found in the mine permit area are listed in Tables 10-10 and 10-11.

Only two species found in the mine permit area are on the endangered species list: the bald eagle and the peregrine falcon. The bald eagle is a winter resident only and the peregrine falcon is not known to nest within the permit area.

Potential impact on bird species would be limited to the proposed new construction areas. Impacts, however, should be minor since the areas involved are small and since equivalent habitat is readily available close by. (See Raptor Survey UDWR - Appendix 10-A

Amphibians

The three amphibians occurring in the permit area (see Table 10-4) occupy similar habitats throughout the region and are unlikely to be affected in any major way by planned activities.

Reptiles

Reptiles found in the permit area are located in many other similar habitats and their populations will not be seriously impacted by planned activities. UDWR personnel will be notified if any denning sites are discovered during mining or construction.

Aquatic Wildlife

Since there are no perennial streams in the surface operation areas, little impact to aquatic wildlife is expected. Huntington Creek, the closest perennial stream to the permit boundary, is located a considerable distance from the surface operation, 1.5 miles. This high quality fishery is protected through Co-Op's Sediment Control Structures (see Chapter 7).

3.5.6.2 Mitigating Measures to be Employed
To Protect Fish and Wildlife

To minimize habitat disturbance and loss, surface activity at the breakout and the ventilation shaft will be minimal. The proposed site is located at the mine portal at Trail Canyon, so no new disturbance will result. Construction will be scheduled to minimize conflict with deer and elk use periods.

The disturbed areas will be reseeded within the next growing season and the resulting seral succession will actually benefit deer and elk. Habitat loss due to construction is limited to the size of the disturbed area and will be small. All water in the permit area is ephemeral channels. Any water sources necessary to wildlife will be protected or an alternative source will be provided.

Structures that pose a barrier or hazard will be provided with passageways, buffers, fences, or other necessary protection, as

determined by consultation with UDWR.

The applicant will inform employees of the vulnerability of local wildlife and will admonish them to avoid all harassment or unnecessary activity. In addition the training film offered by the UDWR "Coal Mining and Wildlife" will be shown annually to all employees.

Any discovered wildlife impact not described here will be mitigated by Co-op Mining Company with methods agreed upon by UDWR.

Since no impacts are expected to the ephemeral waters of mine area in the near future, no special mitigation plan concerning Bear Creek is presented here.

3.5.6.3 Monitoring Procedures

Bear Creek does not warrant a biological or habitat monitoring effort in the area of the mine lands.

3.5.7 Protection of Air Quality

Co-op Mining Company will use the best mining technology available to maintain maximum utilization and conservation of coal while preserving environmental integrity. The operator will employ the best management practices for fugitive dust control. The National Ambient Air Quality Standard (NAAQS) will be well maintained.

3.5.7.1 Projected Impacts of Mining Operation on Air Quality

Particulates are the only pollutant which might impact air quality at the mine area. Increase in concentrations of other pollutants such as sulfur dioxide, nitrogen oxide, carbon monoxide and photochemical oxidants would be negligible. The main source of total suspended particulates (TSP) would be coal particles, which would settle out within short distances (1 mile or less) downwind. The mining operation would not be a "major source" under the Prevention of Significant

Deterioration (PSD) regulations because total annual controlled emissions of particulate matter are expected to be less than 250 ton/year.

The level of estimated impacts can be put in perspective by comparing the calculated pollutant ground-level concentration with the NAAQS established for protection of human health and welfare.

The worst case analysis of impacts (Aero-Vironment, 1977) shows that the total ground-level concentration including an average background of 20 Hg/m^3 would be well under the federal secondary standard of 150 Hg/m^3 .

During typical meteorological conditions, impacts in the region would be lower than quantities derived from the worst case analysis resulting from increased dispersion during the 24-hour period. The increased dispersion would be brought on by more normal wind speeds and more meander in the wind direction than considered in the worst case analysis.

The annual TSP concentrations (including background) would be 25 Hg/m^3 , which is less than the NAAQS of 60 Hg/m^3 . The greatest impact would be near Huntington Canyon and it would be caused by human activity.

The impacts of TSP concentrations from one sub-air basin to adjoining ones would be low because of mixing and fallout over the distances involved.

3.5.7.2 Mitigating Measures to be
Employed to Control Air
Pollutants

The main source of air pollutants would be dust from autos and trucks traveling on unpaved roads and from coal loading sites. Unpaved roads used in conjunction with the mining activities will be treated with water and/or non-toxic chemical dust suppressants.

Vehicular traffic will be restricted to authorized personnel and maximum vehicle speed will be limited to 20 miles per hour.

The speed restriction signs will be posted along the roads.

3.5.7.3 Air Quality Monitoring Plan

The mining operation would not be a "major" source" under the PSD regulations because total annual controlled emissions of particulate matter are expected to be less and 250 ton/year. Therefore, the requirement for air quality monitoring is not anticipated. (See Chapter 11, U. Health Approval letter).

3.5.8 Subsidence Control Plan

Co-op Mining Company will use the room and pillar method of mining. This method is outlined in detail in Section 3.4.1

Maximum extraction could result in surface subsidence over a long term. Subsidence will depend on the amount of cover over the coal seam, the amount of coal removed under the methods of mining and the stratigraphy of the formations above the coal seams. Partial extraction leaving the pillars in place

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will reduce or eliminate subsidence, but is less desirable from a standpoint of maximum economic resource recovery.

There are no known anticipated effects from subsidence due to the amount of overburden and the strata above the coal seam. Surface fractures on the permit area have been minimal.

Necessary support pillars will be left in place to assure entries for the continuation of mining as per mine plan.

Barrier pillars will be left to protect the escarpments from mass failures. Rock formations are all sedimentary. They are composed of stratified layers of friable sandstone and soft silt and clay shales. The jointed, weathered nature of the rock, combined with the interlayering of the sandstone and shale contribute to frequent rockfalls and minor slope failures along the steep escarpment slopes.

Subsidence will have no effect on the surface facilities since no such structures are located over mined-out areas.

3.5.8.1 Projected Impacts of Subsidence

The surface of the area to be mined that might be impacted by subsidence is used primarily for cattle grazing and wildlife habitat. No known aquifer exists above the immediate coal zone. Buildings, conveyors, etc. for the mining operation are all located East of the coal field. In general the area is rugged with limited access and not readily accessible to the public. Subsidence is not expected to be significant at the depths involved in the new areas.

3.5.8.2 Control Measures to Mitigate Impacts

The impact of the observed subsidence will be evaluated and used as a guide in determining the need for control of subsidence and for mitigation. The need for subsidence control and for a specific mitigating measure will need to be site specific. The surface water supply will need to be protected or mitigating measures utilized if adverse impacts occur.

Subsidence control can be accomplished by several methods as needed, such as:

- 1) Not pulling pillars in selected sensitive areas (i.e. near out-crops).
- 2) Uniform extraction to minimize impacts.

Mitigating measures are limited in this relatively inaccessible area. Damage to any surface structures including fences and roads can be repaired. The mitigation of flow reductions or drying up of a water source must be site specific. Flow from springs can be diverted or conveyed over a crack that might disrupt flow. Water can be supplied to the area if a critical need exists.

3.5.8.3 Subsidence Monitoring

A base map has been prepared showing contours and surface features that might be impacted by subsidence, such as surface structures and springs (Plate 3-3). The extent of



1



2



3

mining is shown on Plate 3-4 and the area where pillars will be removed is indicated.

This base map will be updated annually. Co-Op will notify adjacent property owners concerning subsidence potential prior to approaching their boundaries. Co-Op will conduct an annual survey to identify all evidence of subsidence. As annual field survey will be made to identify observable subsidence.

When subsidence is observed to adversely impact a surface structure or resource, the extent of the impact will be evaluated.

As pillars are pulled under the western portion of the mine plan area, impacts will be anticipated and hazards assessed on a site-specific basis. An overburden of approximately 1,000 feet or more in the western portion of the mine plan area should minimize surface impacts.

Sandstone formations overlaying the Blackhawk coal bed should better distribute stresses and reduce the tendency for surface cracks and subsidence at the surface.

3.5.9 Waste Disposal Plans (Spoils, Coal Processing Wastes, Mine Development Wastes, Non-Coal Wastes, Removal, Handling and Storage

Co-op does not anticipate the handling of development waste rock in its mining operation although a contingency plan has been developed if the need were to become critical in the effort to maximize coal removal. It is for the above purpose that Co-op has designated a waste rock storage site in Trail Canyon. This area was used historically in this capacity and has the necessary hydrolic safeguards presently implemented. The waste would be handled in the same manner as coal and truck hauled to this area. This area would be addressed as a permit modification or New Permit Application.

UMC 817.89 DISPOSAL OF NON-COAL WASTE

The Co-op is presently undertaking a massive clean-up operation wherein large quantities of scrap have already been removed from the permit area. Once the operation is complete (September 1, 1983) the balance of the salvageable equipment will be stored in the designated area.

A plan for this type of storage yard was discussed with a number of the technical staff in July of 1983 and will be generated and submitted to the division for their review prior to implementation.

In the interim, the equipment which is not scrapped out will be temporarily stored on the disturbed sites in both Bear and Trail Canyon. These sites will be situated in such a manner to insure that whatever runoff results from the area will pass through designated sediment facilities. The non-coal waste (other than rock refuse) generated in the operation of the mine will be placed in metal dumpsters which are strategically located on the property. A local trash collector is contracted to replace these bins when they are approximately 80% full.

3.5.9.1 Projected Impacts of Disposal Areas and Methods on the Environment

Not Applicable

3.6 RECLAMATION PLAN

Co-op Mining Company, upon completion of mining on this permit area, will reclaim all disturbed surface areas as diligently and rapidly as possible, to restore the property to a variety of alternative uses.

The postmining land uses could be grazing, recreation, wildlife and mineral. Portals will be closed and concrete foundations will be buried with fill material.

Where physically possible, disturbed areas will be scarified, sloped, topsoiled and seeded or planted before the next growing season. The site will be revegetated with a mixture of grasses, forbs, brush and trees as agreed upon with the appropriate land management agencies. Reclaimed areas will be maintained until stable up to five years. Seed will be planted with the best techniques available at that time. (Seed List Attached under 3-F)

Proposed access roads, to the mine portals, will be reclaimed and revegetated. This will accomplish a dual purpose of controlling runoff and revegetating the hillsides with vegetation comparable to existing growth.

The initial step in the reclamation plan is to seal all large-diameter openings by backfilling these openings with non-combustible material. The seals

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The initial step in the reclamation plan is to seal all large-diameter openings by backfilling these openings with non-combustible material. The seals

will be designed such that mine drainage, if any, will not enter surface water bodies. For a more detailed description of the sealing of openings, see Section 3.6.3.1, Sealing of Mine Openings, Drill Holes, Wells, etc.

The next step in reclamation would be the removal of all surface structures, equipment and road blacktop. Once this has been accomplished, all solid waste generated in the abandonment operation will be collected and removed from the reclaiming areas. Additional information concerning this aspect of the reclamation plan is present in Section 3.6.3.2, Removal of Surface Structures.

Backfilling of the subterranean portion of the silos, holes and depressions will be the next reclamation activity. Once the backfilling is completed, the disturbed areas will be graded and recontoured. A detailed description of this reclamation phase is found in Section 3.6.4, Backfilling and Grading.

Reclamation Timetable

A suitably permanent and diverse vegetative cover

to benefit wildlife will be established on all affected areas of land.

Land reclamation will take place as soon as possible after surface disturbance. All cut and fill slopes resulting from construction of access roads and railroads will be stabilized and revegetated at the first seasonal opportunity. Areas occupied by support facilities such as roads, office buildings, shops, coal handling structures and conveyors will not be reclaimed until conclusion of the mining operations. Demolition and removal of structures should commence in March, April, 2033. Portal seals and grading should commence in June and be completed by September, 2033. Drill and hydroseeding and stream enhancement work should be completed by October 30th. The area should be monitored during July, 2034, and again during July, 2035. At this point shrub and tree density, as a result of planting, can be determined. When the vegetation standard is achieved, the sediment control structures will be removed.

3.6.1 Contemporaneous Reclamation

Interim reclamation (during operations) will occur in areas that are no longer needed or that

require short-term stabilization. These areas will be seeded and mulched. Other areas may be reclaimed at different times during the operation as specific activities are concluded.

(Appendix 3 - C). This same procedure will apply to any area which becomes available during the life of the mine, and will be implemented upon the first available favorable season.

3.6.2 Soil Removal and Storage

To prevent suitable topsoil from being wasted or contaminated by spoil or other waste materials topsoil will be removed from any new construction areas as a separate operation. The topsoil will be stockpiled and protected from wind and water erosion and contamination which might lessen its capability to support vegetation. The following subsections deal specifically with the various phases of the topsoil and subsoil handling plan. There is approximately 2,600 cu. yds. of topsoil on site in Bear Canyon. The balance of 2,500 cu. yds. has been optioned from RACO Company and is presently being tested to insure its compatibility. If this material is satisfactory, it will be purchased stockpiled and revegetated at its present location (adjacent to CV Spur - Carbon County, Utah. (See Appendix 3-D)

require short-term stabilization. These areas will be seeded and mulched. Other areas may be reclaimed at different times during the operation as specific activities are concluded. (Appendix 3 - C)

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Topsoil Removal

At the start of any construction phase, topsoil has been collected from the area where useable soil existed. Existing vegetation has been removed and the topsoil collected prior to excavation or other surface disturbance operations within the affected areas.

The depth of topsoil removal in each case depends on the amount of A and B horizon material as defined in OSM Regulation 30 CFR 783.21 and 783.22.

The topsoil removed in these areas consists of A horizon quality material and B horizon quality material. The C horizon material was not removed since it is not sufficiently capable of supporting diverse vegetation. Chapter 8 presents additional soil information.

The equipment used for topsoil removal consisted of bulldozers, front-end loaders and dump trucks. The use of bulldozers require pushing of the topsoil to a collection point for loading into

dump trucks or other means of transportation to the designated stockpile. Adequate supervisory personnel were present at the time of topsoil removal to instruct the equipment operators in the proper techniques of topsoil removal and to ensure that required horizons were removed and stored.

Topsoil Stockpile

During any stockpiling operation, unnecessary compaction was prevented by limiting the equipment traffic over the stockpile.

Plans involving topsoil storage can be labeled as "short term" or "long term" depending on completion of activities in each area and the reclamation schedule presented in Section 3.6.6.

o Short-Term Topsoil Storage Areas

Short-term stockpiles of topsoil will be for areas to be reclaimed almost immediately upon cutting and at final grade. Topsoil will be redistributed promptly to minimize natural degradation processes.

(such as pipeline trenches, etc.)

Long-term Topsoil Storage Areas

During any new construction of areas that will be used for the duration of the mining operation within the permit area, topsoil will be collected and stockpiled. The topsoil will be used later for postmining reclamation of the abandonment areas. Other long-term stockpiles will be established at the proposed loadout site.

Topsoil Protection

The short-term topsoil stockpile will be sprayed with water or temporarily vegetated to retard erosion. The long-term topsoil stockpile will be protected by the following operational steps:

- o A stable surface will be provided in an area outside the influence of active operation.
- o As a stockpile is completed, it will be left in a rough condition to minimize erosion.

- o Stockpiles will be situated and protected to prevent water erosion and sprayed with a tacifying agent.
- o Storage piles will be vegetated with quick-growing soil-stabilizing plants.
- o Signs will be posted to protect the stockpiles from accidental use as fill or from other inadvertent material contamination.
- o The establishment of noxious plant series will be prevented.

The stockpiled topsoil will not be removed or otherwise disturbed until required for the redistribution operation on a prepared, regraded disturbed area.

Topsoil Redistribution

Prior to topsoil redistribution, regraded land will be scarified by a ripper-equipped tractor. The ground surface will be ripped to a suitable depth in order to reduce surface compaction, provide a

roughened surface to assure topsoil adherence and promote root penetration.

Within a suitable time period prior to seeding, topsoil will be distributed on all areas to be reclaimed. During this time the topsoil will be allowed to settle and attain equilibrium with its natural environment. This procedure will be followed for all areas in which facilities such as roadbed, mine pads and building sites are to be abandoned.

Topsoil redistribution procedures will ensure approximate uniform thickness consistent with the proposed reclamation plan. Topsoil will be redistributed at a time of the year suitable for establishment of permanent vegetation.

To minimize compaction of the topsoil following redistribution, travel on reclaimed areas will be limited. After topsoil has been applied, surface compaction will be reduced by using a dryland chisel plow running at a suitable depth. This operation will also help prepare a proper seed bed and protect the redistributed topsoil from wind and water

erosion. Co-op Mining Company will exercise care to guard against erosion during and after application of topsoil and will employ the necessary measures to ensure the stability of topsoil on graded slopes.

3.6.3 Final Abandonment

Co-op Mining Company anticipates that the postmining land uses of the permit area will be the same as the premining. State and local governments have not proposed any land use changes for the postmining period. This section delineates the abandonment and reclamation steps to be taken which will allow a return to the original land use once mining operations are complete. In general, disturbed portions of the mine plan area will be returned to their original wildlife/grazing habitat.

Method of Achieving and Supporting Postmining Land Uses

The following presents the abandonment steps and revegetation/reclamation activities which represent the method of achieving and supporting postmining land uses. The activities are organized in the ap-

proximate order of execution. These listed activities are also discussed in Chapter 4.

3.6.3.1 Sealing of Mine Openings, Drill Holes, Wells, etc.

Exploratory Holes, Bore Holes, and Wells

Upon abandonment of drilling operations, all drill holes are to be cemented with an approved slurry. The slurry mixture will consist of 5.2-5.5 gal. of water per bag of cement. An appropriate slurry device will be lowered to the bottom of the hole and sufficient slurry pumped through the device to fill 200 feet. The device will then be raised 200 feet and the process repeated. The holes will be completely plugged from the bottom to within 3 feet of the collar in this way. A monument will be erected over sealed holes.

Shafts

The shafts will be filled from bottom to collar with non-combustible material. A cap consisting of a 6 inch thick reinforced concrete slab will be used as a seal.

The cap will be equipped with a 2 inch diameter vent pipe and will extend for a distance of 15 feet below the surface of the shaft collar.

Mine Entries - UMC 817.13-15

Seals will be installed in all entries as soon as mining is completed and the mine is to be abandoned. The seals will be located at least 25 feet inside the portal mouth entry. Prior to installation, all loose material within 3 feet of the seal area will be removed from the roof, rib and floor. The mine entry seals will be made of solid concrete blocks (average minimum compressive strength of 1,800 lbf/in² tested in accordance with ASTM C140-70) and mortar (1 part cement, 3 parts sand and no more than 7 gallons of water per sack of cement) to form a wall two blocks thick.

Seals will be installed in the following manner: The seal will be recessed at least 16 inches deep into the rib and 12 inches deep into the floor. No recess will be made into the roof. The blocks will be at least 6 inches high, except in the top course and 8 inches wide. The

The blocks will be laid and mortared in a transverse pattern. In the bottom course, each block will be laid with its long axis parallel to the rib. The long axis in succeeding courses will be perpendicular to the long axis block in the preceding course. An interlaced pilaster will be constructed in the center. The seals will have a total thickness of 16 inches.

Where conditions permit, the portal seals will be graded to conform with existing surface contours and planted. In those instances where sizable highwalls established in preparing the portal site cannot be returned to original contours, the opening in front of the wall will be filled with non-combustible material as above and the portal and entire exposed seam on the highwall will be covered with 6 to 8 feet of non-combustible material, graded, covered with suitable material and seeded. For illustration of a typical seal, see Fig. 3-1.

3.6.3.2 Removal of Surface Structures

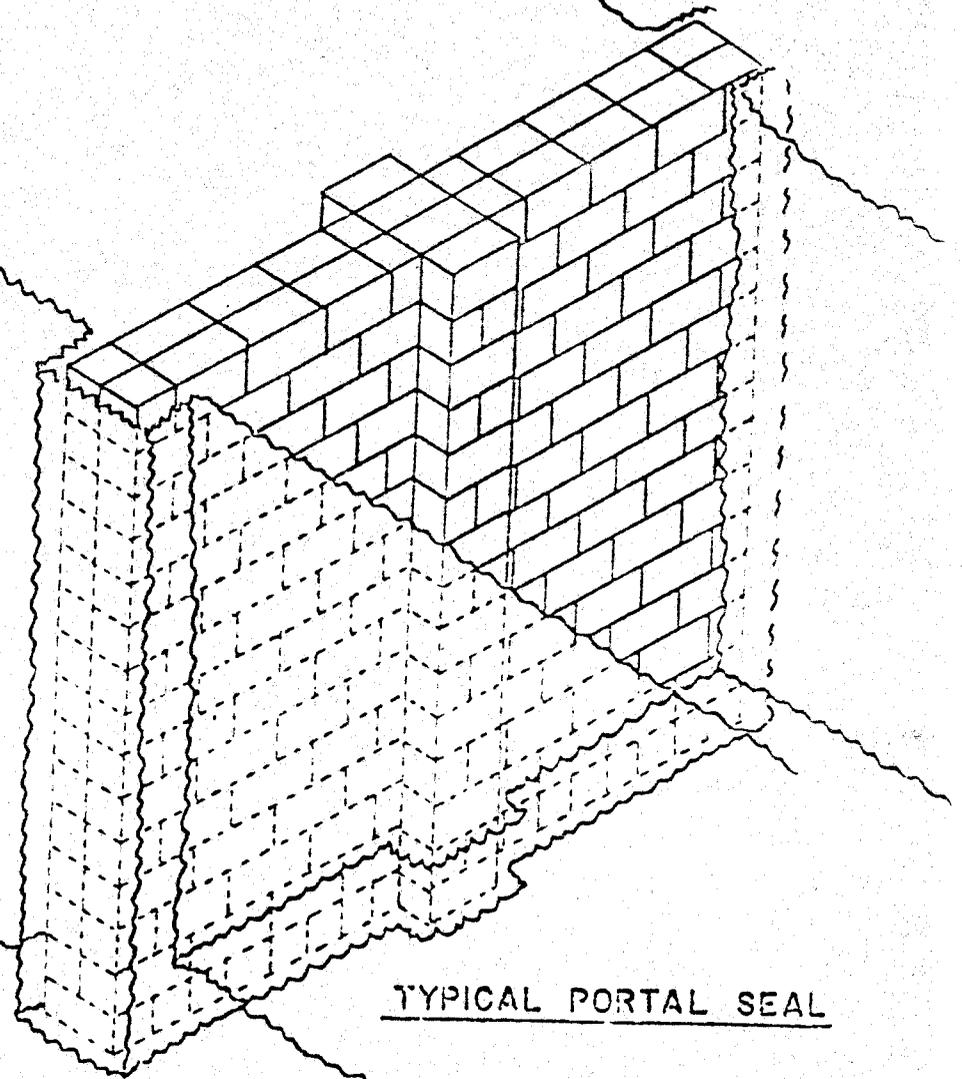
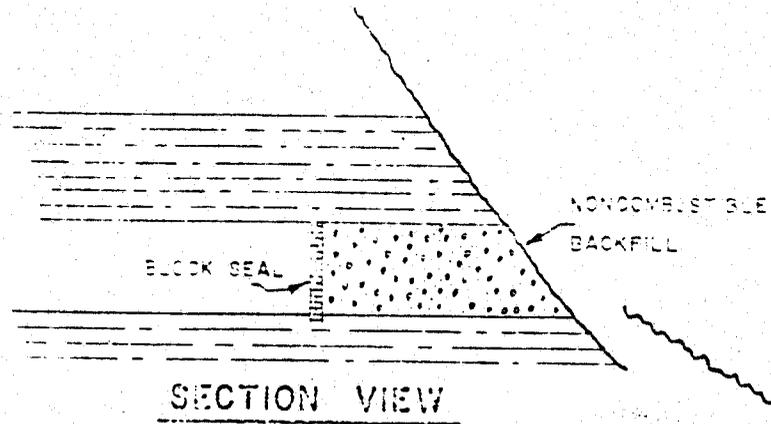
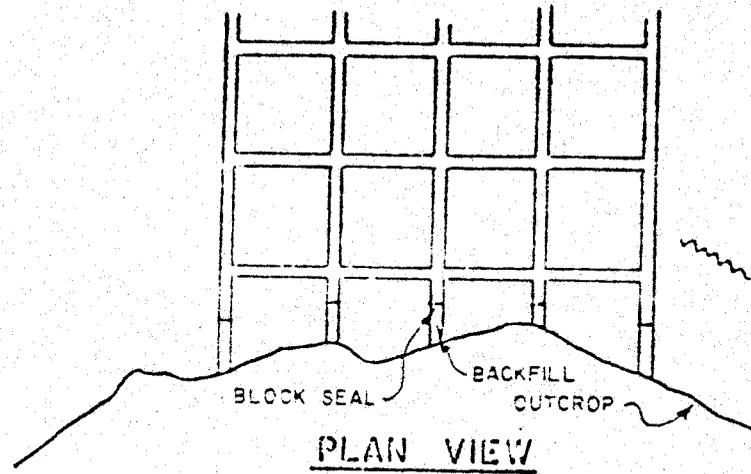
Co-op Mining Company will restore disturbed land-surface areas to their approximate pre-mining conditions, to the extent technologically and economically feasible.

The blocks will be laid and mortared in a transverse pattern. In the bottom course, each block will be laid with its long axis parallel to the rib. The long axis in succeeding courses will be perpendicular to the long axis block in the preceding course. An interlaced pilaster will be constructed in the center. The seals will have a total thickness of 16 inches.

Where conditions permit, the portal seals will be graded to conform with existing surface contours and planted. In those instances where sizable highwalls established in preparing the portal site cannot be returned to original contours, the opening in front of the wall will be filled with non-combustible material as above and the portal and entire exposed seam on the highwall will be covered with 6 to 8 feet of non-combustible material, graded, covered with suitable material and seeded. For illustration of a typical seal, see Fig. 3-1. Temporary seals are discussed in Appendix 3-F.

3.6.3.2 Removal of Surface Structures

Co-op Mining Company will restore disturbed land-surface areas to their approximate pre-mining conditions, to the extent technologically and economically feasible.



PORTAL SEALS

Fig. 3-1

Building Removal

Office, shop, storage, scale, buildings and bath house:

- o Each structure will be removed.
- o Foundations will be removed if they are close to the surface. Deeper foundations will be fractured and covered with at least 3 feet of dirt.

Road Abandonment

The access road and small support roads will be reclaimed. Culverts and blacktop surfacing material will be removed. Reclamation would then include recontouring, ripping, adding cross drains, water bars, topsoil and seed. See Appendix 3-G, Detailed Plan.

Mine Operational System Removal

Systems such as domestic water will be phased out and removed or buried.

Area Cleanup

Building Removal

Office, shop, storage, scale, buildings and bath house:

- o Each structure will be removed.
- o Foundations will be removed if they are close to the surface. Deeper foundations will be fractured and covered with at least 3 feet of dirt.

Road Abandonment

The access road and small support roads will be reclaimed. Culverts and blacktop surfacing material will be removed. Reclamation would then include recontouring, ripping, adding cross drains, water bars, topsoil and seed.

Mine Operational System Removal

Systems such as domestic water will be phased out and removed or buried.

Area Cleanup

Solid waste generated in the abandonment operation will be collected and removed.

3.6.3.3 Disposition of Dams, Ponds and Diversions

After the disturbed areas are stabilized and runoff is comparable to the area's premining conditions without detention time, the site drainage system will be removed. The site drainage system areas will be backfilled and revegetated. All ponds will be drained and allowed to dry; thereafter they will be back-filled and revegetated.

Natural drainage patterns will be returned to a horizontal drainage pattern similar to the original.

3.6.4 Backfilling and Grading Plans

The objective of the proposed backfilling, soil stabilizing, compacting, contouring and grading process is to achieve a reclaimed surface which will

provide a variety of topographic features enhancing postmining land use.

Reclamation earthwork activities will be conducted as outlined in Section 4.5, Postmining Land Use and Section 3.6.6, Schedule of Reclamation. The steps to be taken in the backfill, soil stabilization, compaction, contouring and grading problems are described in the following subsections.

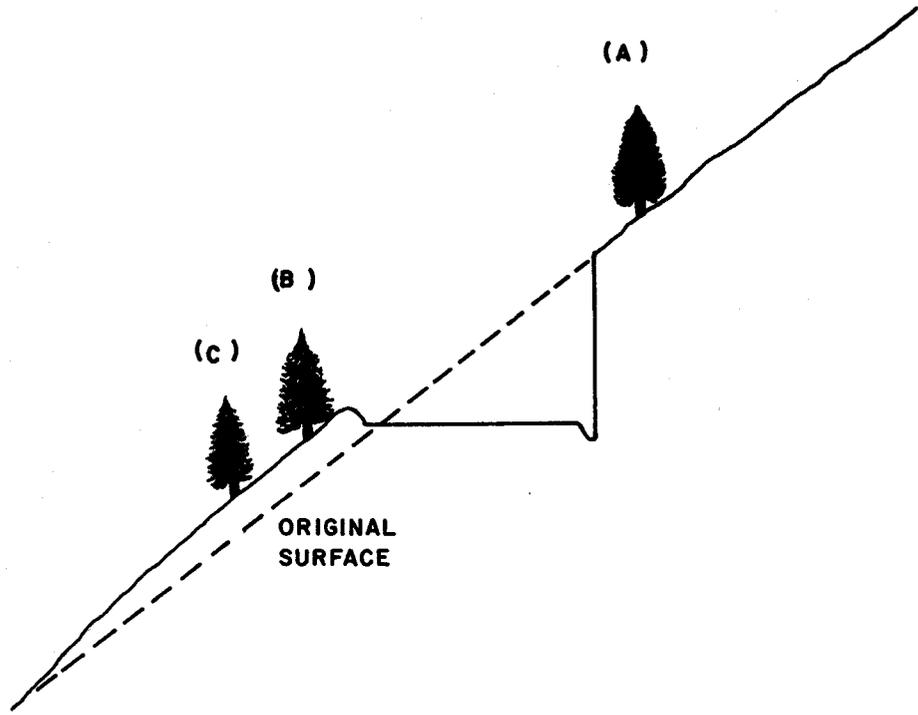
Backfilling operations, utilizing equipment such as rubber-tired scrapers, front-end loaders and dump trucks, will be conducted in the portal and treatment facility areas. Holes or depressions will be filled when the mining operation is concluded. Compaction operations utilizing equipment such as sheeps-foot tampers, will be conducted to stabilize all filled holes and depressions. The portal fill material will be put in place with an LHD (load, haul, dump) unit to ensure proper backfilling.

In general, the backfilling and grading operation will take place in the following manner:

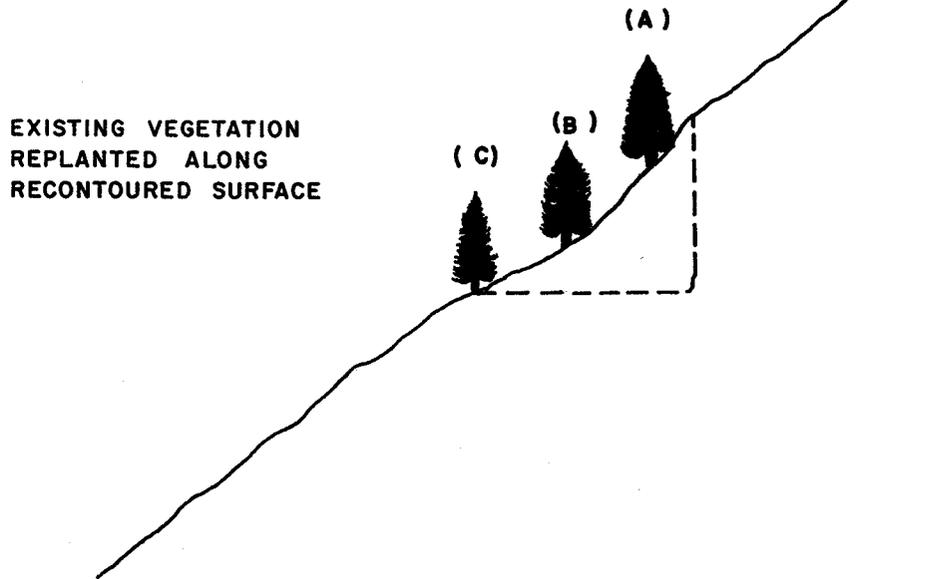
1. All mining portals will be sealed and backfilled as previously described.
2. Solid waste generated in the facilities removal will be collected and removed to an approved landfill.

3. A backhoe and dozer will work in conjunction to remove the outer edge of the operational benches and compact it against the highwall. This will be accomplished by the backhoe reaching over the edge of the bank approximately 20' pulling the material back. The dozer will then push and compact this material from the highwall outward to reach a bench slope of approximately 33h:lv for drainage purposes.
4. This operation will start on the upper bench and work across the bench to the upper access road.
5. The backhoe and dozer will work in the same manner to eliminate the access road, working down to the lower pad. A typical cross-section of the reclaimed road cut is shown in Fig. 3.6.4-A.
6. The above procedure will continue on down the canyon reshaping the mine yard and disturbed area to the configuration shown on Plate 3-2, Postmining Topography.
7. As backfilling and grading is completed, operational areas will be scarified by ripping to a depth of 18" with a dozer where possible. Steep slopes will receive special ripping to create ledges, crevices, pockets and scree. This will reduce compaction and prevent topsoil slippage, and improve soil retention and vegetation establishment.

EXISTING



RECLAIMED



TYPICAL SLOPE RECLAMATION

ATTACHMENT 2

FIGURE
NO.
3.6.4.-A

8. Topsoil will be spread over the disturbed areas after the grading and ripping is complete.
9. Upon completion of the above, the area will be reseeded as per the plan.
10. Material used for the recontouring will be taken from side slopes or other existing embankments within the disturbed area. In general, material to be compacted or used for fill will be taken from a side slope or embankment close enough to allow for pushing into place by a dozer, rather than loading and hauling by truck.

3.6.4.1 Recontouring

The cut slopes will be constructed in a manner which will achieve the necessary physical stability. This design will prevent slides and other related erosional damage. Upon abandonment, slopes will only be reduced to the amount physically possible. This amount will be limited to the reach of a back hoe, approximately 20'. Steep slopes and highwalls are inaccessible to conventional equipment, and thus, cannot be reduced or flattened appreciably during reclamation. Stability analyses on these areas have confirmed that they have a factor of safety greater than 1.3 as they presently exist.

Stability and the designated post-mining land use can be achieved without extensive backfilling and return to the approximate original contour.

In February 1981, a slope stability analysis was performed by ^MDanes and Moore on the Bear Canyon Mine access road. The purpose of this study was to analyze the static safety factor of the side-cast cut and fill slopes along this road. The conclusion of this study was that the slope stability had a safety factor ranging from a minimum of 1.43 to 2.15. This study was performed on the soil characteristics of the down-cast material which was not completed. This is the same material that will be partially pulled back and compacted against the highwalls, increasing both the cohesion and unit weight of material and increasing the safety factor above the minimum of 1.43. This will result in a factor of safety well above the required 1.3. (Copies of the Danes and Moore report along with an earlier report are included in Appendix 3-F.

3.6.4.2 Removal or Reduction of Highwall

Highwalls will be reduced to the extent practicable to develop a static safety factor of at least 1.3.

Only those highwalls that can be lessened by reaching with a backhoe will be reduced. Highwalls greater than 20' in height will be left as shown on Plate 3-2, Postmining Topography; however, these highwalls are shown to have a stability safety of greater than 1.3 by the following analyses:

A 1981 slope stability study of the Bear Creek Mine Access Road by Dames and Moore indicated a static safety factor of 1.43 to 2.15. (Appendix 3-F). This study was performed to analyze the static safety factor of the side-cast cut and fill slopes along the Bear Creek Portal Access Road. The maximum static safety factor of 2.15 was achieved in the trial arc which included the highwall area. (Shown on Plate 2 of their report). As a further note on page 5 of their Feb. 20, 1981 report, they indicate, "It should be noted that the factor of safety of the trial arc which cuts deep into the slope does not consider the presence of bedrock, increasing strength of the natural soils with depth, or the effect of the calcium carbonate cementation in the soil. If the above were incorporated

into the analysis, the factor of safety would be significantly higher." Since the highwalls are commonly made up of varying layers of bedrock material, it is reasonable to assume their strength and stability will increase accordingly.

As a further check on the highwall stability, a separate analysis was performed using a different method. This analysis uses the Hock method, and is based on rock parameters typical of those contained in the Blackhawk Formation of the Wasatch Plateau. The safety factor is calculated using the following parameters:

Maximum Slope Height	100'
Slope Angle	80
Rock Mass Cohesion	65 psi
Rock Mass Friction Angle	31
Rock Mass Bulk Density	155 lbs/ft ³

Based on these parameters, and utilizing the Hock charts, included as Fig. 3.6.4.2.A and Fig. 3.6.4.2.B, the highwalls have a safety factor of 2.61 for dry conditions and 2.40 for saturated conditions.

Figure 36.4.2.A

(DRY CONDITIONS)

CIRCULAR FAILURE CHART NUMBER 1

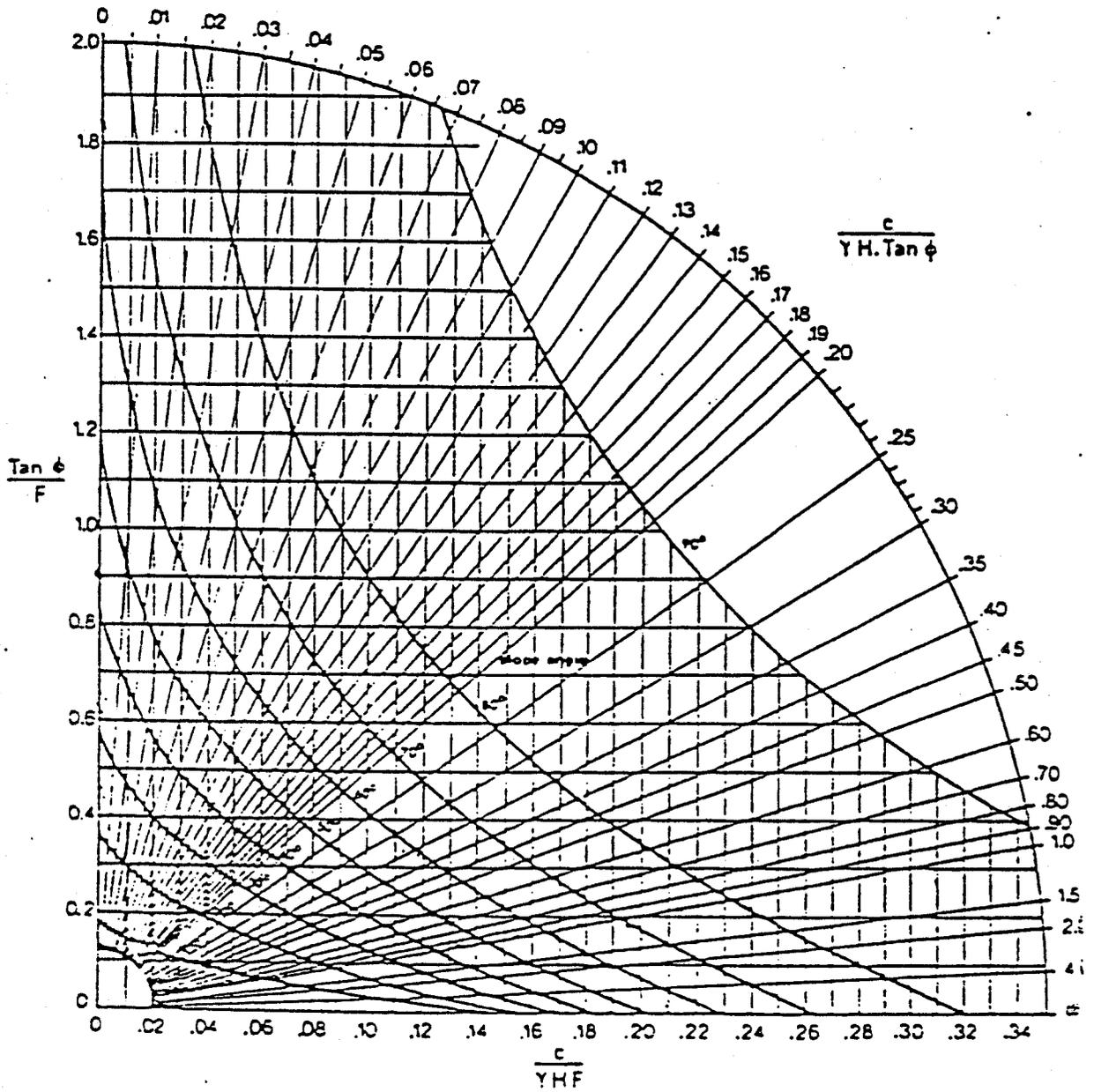
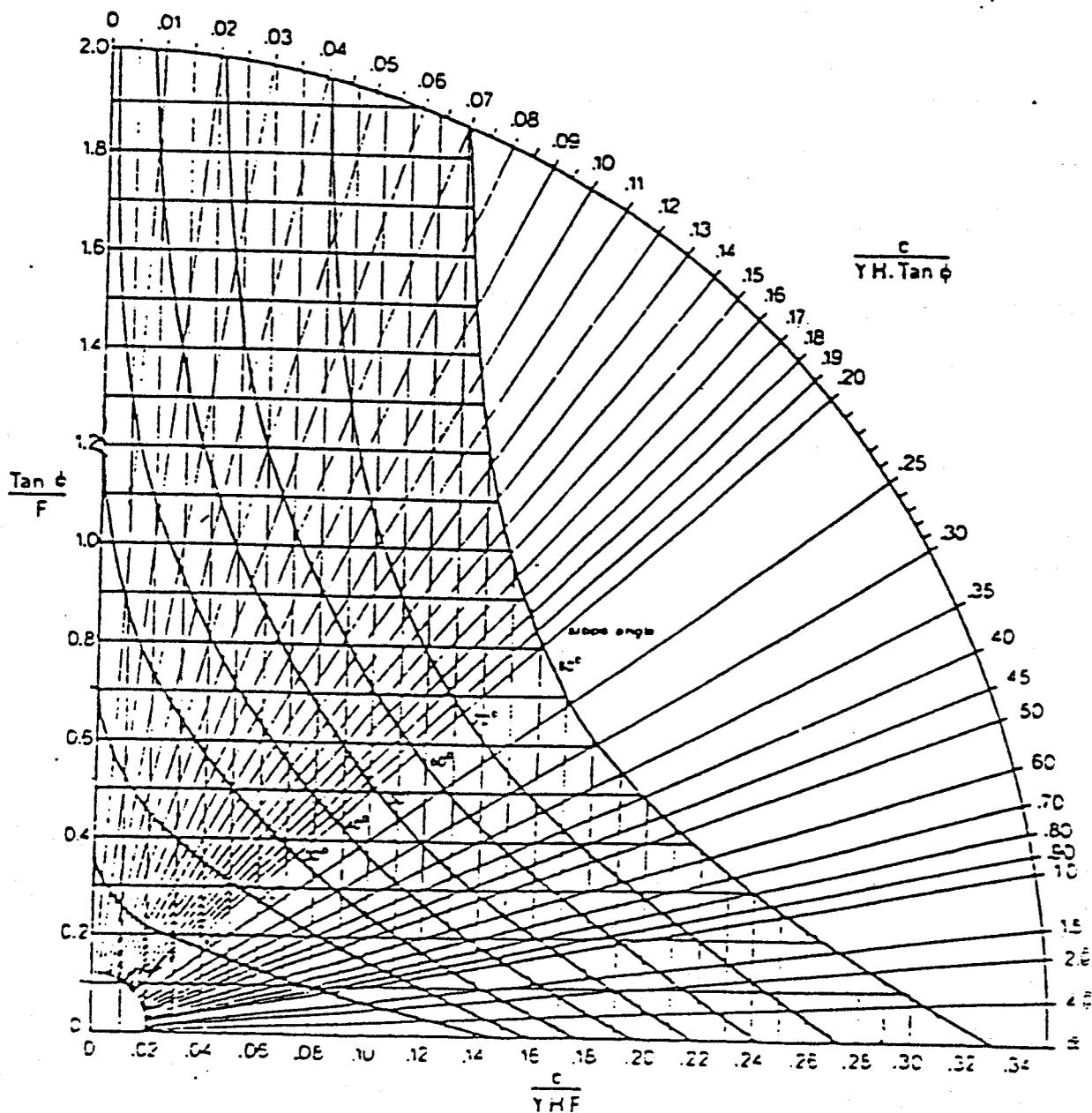


Figure 3.6.4.2.B

(SATURATED CONDITIONS)

CIRCULAR FAILURE CHART NUMBER 5



This agrees with the projections made in the Danes and Moore report, and further substantiates that the highwalls proposed to be left in place will have a static safety factor of greater than 1.3.

Retention of highwalls is therefore proposed based on the following:

1. The retained highwalls will not be significantly greater in height or length than the dimensions of existing cliffs in the surrounding area. Extensive, high cliffs are common in the Wasatch Plateau.
2. The residual highwall is similar in structural composition to the pre-existing cliffs in the surrounding area, and will be compatible with the visual attributes of the area. Highwalls are composed primarily of sandstones and sandy shales which are common in the natural cliffs of the area.

3. The residual highwall will have a static safety factor of greater than 1.3 and will be compatible with the geomorphic processes of the area. The rock types common in the highwall are very similar to those in surrounding vertical cliffs; therefore, the highwalls will react similarly to the geomorphic processes in this area.

3.6.4.3 Terracing and Erosion Control

The need to terrace some of the steeper slopes within the mine plan area currently is not anticipated.

Erosion control measures which will be employed are specific to each situation. Mulching to reduce and limit rainfall impact will be a widely used erosion control practice.

3.6.4.4 Soil Redistribution and Stabilization

Prior to redistribution, the topsoil stockpile will be disced with farm tractors or similar equipment to break up the topsoil, thus ensuring a more uniform spreading of the topsoil throughout the disturbed areas. The regraded land will be scarified by a ripper-equipped tractor. The ground surface will be ripped to a suitable depth to reduce surface compaction, provide a roughened surface to assure topsoil adherence and promote vegetational root penetration.

Within a suitable time period prior to seeding, topsoil will be distributed on all areas to be reclaimed. During this time, the topsoil will be allowed to settle and attain equilibrium with its natural environment. This procedure will be followed for all areas in which facilities such as roadbeds, mine pads and building sites are to be abandoned.

Topsoil redistribution procedures will ensure an approximate uniform thickness consistent with

with the proposed reclamation plan. Topsoil will be redistributed at a time of the year suitable for establishing permanent vegetation.

To minimize compaction of the redistributed topsoil, travel on reclaimed areas will be limited. After topsoil has been applied, surface compaction will be reduced with suitable equipment. This operation will also help prepare a proper seedbed and protect the redistributed topsoil from wind and water erosion. Co-op Mining Company will exercise care to guard against erosion during and after application of topsoil and will employ the necessary measures to ensure the stability of topsoil on graded slopes.

In addition to the vegetative stabilization discussed in Section 3.6.5, Revegetation Plan, physical stabilization of the soil is also planned. The specific methods to be implemented will be defined on the basis of additional soil analyses. An example of the soil stabilization methodology that might be used includes the placement of

crushed and heavier material at the toe of road-fill slopes.

3.6.5 Revegetation Plan

All disturbed areas will be planted and revegetated during the first appropriate season following grading and topsoil redistribution procedures and will include, as necessary, the addition of remedial soil treatments. A suitable, permanent, diverse vegetative cover, selected on the basis of UDWR recommendations, will be established on all reclaimed areas. The proposed reclamation schedule is presented in Section 3.6.6, Schedule of Reclamation. The following subsections describe the major aspects of the proposed revegetation plan.

3.6.5.1 Soil Preparation

Scarifying Areas

Operational areas will be scarified to reduce compaction and to prevent topsoil slippage. Steep slope areas which must remain after abandonment will receive special ripping to create ledges, crevices, pickets and screens. This will allow better soil retention and

and vegetation establishment.

Fertilization and Neutralization - UMC 817.25

The topsoil will be tested before it is seeded to determine the type and amount of fertilizer or neutralizer required. Soil analyses will measure the following components:

- o Micronutrients
- o Potassium, calcium, magnesium
- o Phosphorus
- o Nitrogen
- o Soil pH and salinity
- o Soil texture

Chemical analyses for micronutrients may be conducted by testing soil extracts with DTPA solution and measured by use of an atomic absorption analyzer. Ammonium acetate may be used to extract potassium, calcium and magnesium for atomic absorption analysis. Phosphorus may be determined with sodium bicarbonate extraction and colorimetric analysis. The Kjeldahl method may be used for determination of total nitrogen. Soil texture may be determined by a Bouyoucos hydrometer method (sodium hexametaphosphate dis-

persing agent). Soil pH may be determined on a 1:1 soil/water mixture tested with an electrode pH meter. Salinity may be analyzed by using a Wheatstone conductivity cell on an extract of each soil sample.

All necessary fertilization or neutralization, as determined by soil testing will be done.

3.6.5.2 Seeding and Transplanting

Steep slopes will be seeded with a hydro-seeder. Gently sloping and flat areas will be seeded with a drill seeder. Many shrubs and all trees will be planted by hand setting to ensure a permanent plant cover.

3.6.5.2.1 Species and Amounts/Acre - Shrubs, Trees, Grasses and Forbs - Different Plans for Different Areas

With UDWR recommendations and the 1981 vegetation field study as a basis, a suitable permanent, effective and di-

verse vegetative cover of species native to the permit area, or appropriate substitutes, will be established on all affected areas.

Plants used to revegetate the disturbed sites will be selected specifically for the vegetative community to be established in the given area.

The dominant species used for each vegetative type will be chosen on the basis of premine diversity values (see Section 9.3.6), available seed source and enhancement of postmine land use. Some of the native plants to be used for revegetation will be wheatgrass, salina wildrye, sagebrush, pinyon and juniper.

The species ultimately selected for use and the numbers or amounts per acre will depend also on the steepness and exposure of the slopes to be revegetated. For south-facing and sunny slopes, a mixture of big sagebrush, rubber rabbitbrush, Saskatoon service-berry, pinyon pine and Utah juniper may be planted by hand-set-

ting or seeding on an appropriate schedule to produce the equivalent of 1-m (3.25 foot) intervals.

Further recommended species and seeding protocol can be found in Appendix 9C and 9D.

3.6.5.2.2 Methods Including Quantity and Spacing

Methods, quantity and spacing of seeding are covered above in Section 3.6.5.2 and 3.6.5.2.1

3.6.5.3 Mulching

On all reclaimed areas a wood fiber mulch will be used to enhance the moisture retention required for seed germination. Mulch will have tackifier to adhere to the soil. The steeper slopes will require a hydromulch of a more permanent nature and/or the addition of burlap or soil-retaining matting. Mulch with tackifying agent may be used on steep banks.

3.6.5.4 Irrigation

Since the species used for reclamation are known for their survival characteristics, it is felt that artificial application of additional water will not be required. Should lower than average precipitation or irregularities in distribution of precipitation occur following the initiation of reclamation procedures, irrigation may be used on a short-term basis. Otherwise, irrigation may be primarily used if initial revegetation attempts fail and if such irrigation is considered to be a major factor in achieving revegetation.

3.6.5.5 Management

Deer and rodent use of areas planted with tree and shrub species will be observed yearly. If heavy use of the planted trees and shrubs by deer appears probable, appropriate protection measures will be taken. Also, should significant rodent damage become likely, a control program may be developed in conjunction with UDWR and appropriate land management

agencies.

3.6.5.6 Vegetative Monitoring, Revegetation
Success, Assessment and Test Plots

- Range Site Determination
- Demonstration Plots
- Re-evaluation of Transects - Every 3-5 years
- Map - Updated Base Aerial Photograph

All seeded areas will be inspected at the end of each growing season to determine the success of the seeding program for a period of at least five years (reclamation years 1-5). Where success is apparent, as represented by achievement of 80% original cover during the 5-year period, monitoring will be discontinued. Any area not achieving 80% original cover in the first five years will be immediately investigated to determine the possible failure cause(s), so that positive steps can be taken to establish the desired permanent vegetation during the next seasonal opportunity. A written report will prescribe the corrective actions to be taken prior to the next growing season.

Standard methods, as outlined in Chapter 9, Vegetative Resources, will be applied to determine the degree of success for revegetation attempts.

3.6.5.7 Soil Testing Plan

The soil testing plan is discussed above in Section 3.6.5.1.

3.6.6 Schedule of Reclamation

The general timetable for completing the major steps in reclamation is:

2033- Landfills and solid wastes will be regraded and seeded as they are completed.

2033- Underground mine openings will be closed and sealed as they are abandoned.

2033- Surface facilities will be removed as they become unnecessary.

2033-34-

The completion of surface reclamation will be in as short a time as possible after operations cease.

3.6.6.1 Detailed Timetable for Completion of Each Major Step in Reclamation

The specific timetable for completing each major step or phase in reclamation is not applicable for all. Reclamation will commence upon abandonment (year 2033).

3.6.6.2 Reclamation Monitoring

Upon completion, the reclaimed area will be monitored to determine when bond release parameters are achieved. If the monitoring indicates inadequacies, the area will be supplemented with additional efforts.

The monitoring procedures will be the same sampling methodologies which were incorporated in establishment of the reference areas.

Starting in year 3 after reclamation - years 1 & 2 will be ocular estimates with the intent of identifying problem areas.

The success of the reclamation effort will be evaluated by detailed sampling of cover and production on reclaimed areas. The data from the reclaimed areas and the reference area will be collected during the same growing season. If there is no significant difference in cover and production between the reclaimed areas and the reference areas when tested at the 95 percent significance level using a one-tailed t-test, then the areas will be judged to be adequately reclaimed relative to cover and production. Woody plant density will be judged adequate based on a planting rate of one plant per 3.25 interval.

Cover and production on reclaimed and reference areas will be measured using the same methods employed during the baseline studies. Cover will be estimated in randomly located 1.0 square meter quadrats. Production will be measured using a SCS methodology. Shrub density will be evaluated based on the procedure described above.

One of the greatest challenges of revegetation is to create reclaimed areas which have a large number of desirable species. Species diversity on the reclaimed areas will be encouraged by including a

variety of grasses, forbs, and shrubs in seeding and planting mixes. Species diversity will be judged adequate when the relative cover and percent distribution of biomass for the major life form groups approximates that which occurs in the reference areas. That is, if the relative cover by perennial grasses is 50 percent in the reference areas, then the relative cover by perennial grasses on the reclaimed areas should also be approximately 50 percent. This same relationship should also hold true for productivity. If most of the cover and production were being provided by annual forbs on the reclaimed areas and by perennial grasses on the reference areas, then the reclamation would be judged unsuccessful.

The purpose of the above procedures is to demonstrate that based on cover, production, woody plant density, and species diversity, the disturbed areas have been returned to stable plant communities capable of withstanding the intended post-mining land use.

3.6.7 Schedule of Reclamation for Co-Op Bear Canyon Mine

3.6.7.1 Detailed Timetable for Completion of
Major Reclamation Processes

The following schedule of reclamation is proposed to be initiated within 90 days (weather permitting) of final abandonment of the mining operation:

	<u>Acc. Time</u>
1. Seal Portal - 1 week	1 week
2. Remove Structures - 4 weeks	5 weeks
3. Soil Placement (backfilling & grading)	
a. Upper pad - 2 weeks (including road)	7 weeks
b. Channel Restoration - 2 weeks	9 weeks
c. Lower Pad & Diversion - 2 weeks (including road)	11 weeks
4. Seedbed Material & Handling - 1 week	12 weeks
5. Reseeding & Fertilizing - 1 week	13 weeks
6. Mulching - 2 weeks	15 weeks
7. Protective Fencing - 2 weeks	17 weeks

The above reclamation tasks are therefore proposed to be completed within 17 weeks following the start of reclamation activities.

1. Loader - 950B (2½ cy bucket) =	\$ 75.50/hr
Operator	<u>15.00/hr</u>
	\$ 90.50/hr

2.	Crane - Groves RT-580	20 T =	\$ 62.50/hr
	Operator	=	<u>15.00/hr</u>
			\$ 77.50/hr
3.	Truck and Operator		\$ 65.00/hr
4.	Cat D-7G		\$905.00/day
	Operator		<u>120.00/day</u>
			\$1,025.00/day
5.	Backhoe (Cat 235)		\$1,440.00/day
	Operator		<u>120.00/day</u>
			\$1,560.00/day

3.6.7.2 Summary of Reclamation Cost Estimate

2.	Seal Portal	\$ 2,200.00
(b)	Removal Structures	11,753.00
(c)	Soil Placement (backfilling and grading)	30,635.00
(d)	Seedbed Material Handling	4,100.00
(e)	Reseeding and Fertilizer	13,750.00
(f)	Mulching	3,500.00
(g)	Protective Fencing	6,000.00
(h)	Sedimentation Pond Site	<u>5,170.00</u>
		\$77,108.00
(i)	Maintenance and Monitoring	<u>2,500.00</u>
	1984 Dollars	\$79,608.00

3.6.7.3 Reclamation Cost Estimate for Co-Op
Mine

(a) Seal Portals		
Labor - 2 men X \$100/man day X 5 days		\$1,000.00
Materials - 200 blocks/seal X 5 seals X \$1.00/block		1,000.00
Mortar, sand, etc.		<u>200.00</u>
	Subtotal	\$2,200.00
	(a) Subtotal	<u>\$2,200.00</u>

(b) Removal Structures		
<u>Fan</u>		
Labor - 2 men x \$100.00/day x 2 days		\$ 400.00
Equipment (hauling) - 1 truck + operator x 4 hrs x \$65/hr		260.00
20 T crane x 2 hrs x \$77.50/hr		<u>155.00</u>
	Subtotal	815.00

<u>Structures and Conveyor</u>		
Labor - 3 men x \$100/day x 2 days		\$ 600.00
Equipment (hauling) - 1 truck + operator x 16 hrs x \$65/hr		1,040.00
1 loader + operator x 16 hrs x \$90.50/hr (950 B - 2½ cv vd bucket)		<u>1,448.00</u>
	Subtotal	\$ 3,088.00

<u>Substation</u>		
Labor - 2 men x \$100/day x 2 days		\$ 400.00
Hauling - 1 truck + operator x 16 hrs x \$65/hr		1,040.00
Loader - 4 hrs x \$90.50/hr (+ operator)		<u>362.00</u>
	Subtotal	\$ 1,082.00

Bathhouses

Labor - 2 men x \$100/day x 3 days	\$ 600.00
Equipment (hauling) - 1 truck + operator x 12 hrs x \$65/hr	780.00
Loader - 4 hrs x \$90.50/hr (+ operator)	<u>362.00</u>
Subtotal	\$1,742.00

Water System

Labor - 2 men x \$100/day x 1 day	\$ 200.00
Hauling - 1 truck + operator x 4 hrs x \$65/hr	260.00
Loader - 2 hrs x \$90.50/hr (+ operator)	<u>181.00</u>
Subtotal	\$ 641.00

Bathroom Water Tank and Water System

Labor - 2 men x \$100/day x 2 days	\$ 400.00
Hauling - 1 truck + operator x 16 hrs x \$65/hr	1,040.00
Loader - 8 hrs @ \$90.50/hr (+ operator)	<u>724.00</u>
Subtotal	\$2,164.00

Clean-up

Labor - 2 men x \$100/day x 4 days	\$ 800.00
Hauling - 1 truck + operator x 8 hrs x \$65/hr	520.00
Loader (+ operator) - 2 hrs x \$90.50/hr	<u>181.00</u>
Subtotal	\$ 1,501.00
(b) Subtotal	<u>\$11,753.00</u>

(c) Soil Placement (Backfilling and Grading)

Upper Portal Pad

Backhoe + operator x \$1,560/day x 3 days	\$4,680.00
Cat + operator x \$1,025/day x 3 days	<u>3,075.00</u>
Subtotal	\$7,755.00

Channel Restoration

Backhoe + operator x \$1,560/day x 3 days	\$4,680.00
Cat + operator x \$1,025/day x 3 days	3,075.00
Labor - 4 men x \$100/day x 3 days	<u>1,200.00</u>
Subtotal	\$9,955.00

Lower Pad and Diversions

Backhoe + operator x \$1,560/day x 5 days	\$7,800.00
Cat + operator x \$1,025/day x 5 days	<u>5,125.00</u>
Subtotal	\$12,925.00
(c) Subtotal	<u>\$30,635.00</u>

(d) Seedbed Material Handling (9.5 acres)

Cat/Ripper + operator x \$1,025/day	
x 2 days	\$ 2,050.00
Cat/Disk + operator x \$1,025/day	
x 2 days	<u>2,050.00</u>
Subtotal	\$ 4,100.00
(d) Subtotal	<u>\$ 4,100.00</u>

(e) Reseeding & Fertilizing (9.6 acres)

Hydroseeder, operator and driver-	
Seed = \$1,275.00	
Crew = \$100/acre	\$13,750.00
(e) Subtotal	<u>\$13,750.00</u>

(f) Mulching (9.6 acres)

Hydromulcher, operator and driver-	
\$350/acre x 10 acres	\$ 3,500.00
(f) Subtotal	<u>\$ 3,500.00</u>

(g) Protective Fencing (9.2 acres)

6 foot high x 3,000 linear feet x	
\$2.00/foot installed	\$ 6,000.00
(g) Subtotal	<u>\$ 6,000.00</u>

(h) Sedimentation Pond Site	
Backhoe + operator x \$1,560/day x 2 days	\$ 3,120.00
Cat + operator x \$1,025/day x 2 days	<u>2,050.00</u>
Subtotal	\$ 5,170.00
(h) Subtotal	<u>\$ 5,170.00</u>

(i) Maintenance and Monitoring	
\$11,840/year for 5 years @ \$500/acre	\$ 2,500.00
(i) Subtotal	<u>\$ 2,500.00</u>

TOTAL \$ 79,608.00

Note: All costs estimates are based on 1984 dollars.

Co-Op will deposit with the Division of Oil, Gas, and Mining, a irrivocable bank letter of credit upon the approval of bond amount.

3.6.8 Alluvial Valley Floor Determination UMC 785.19

Co-Op contends there are no alluvial valley floors within the permit area. This opinion is based on the following evidence:

1. The soils are of such a nature that both the water holding capacity and the rocky nature preclude any but the sparsest of vegetative cover (see Chapter 8 Soils).

2. The area receives less than 14" annual precipitation and has no evidence of subterranean irrigation.
3. Water quality of the intermittent Bear Creek is marginal and the flows are tied to precipitation event rather than ground water interaction.
4. The area has no history of agriculture attempts and the terrain is such as to preclude any but the minimum of level areas of small size to facilitate USC.

Co-Op Mine requests the Division to evaluate the site-specific conditions and render a judgement in this regard.

3.6.9. Temporary Cessation

In the event of a temporary cessation of operation, Co-Op will notify the Division within 48 hours of pending shut down and will submit all information regarding exact number of surface acres and the horizontal and vertical extent of sub-surface strata in the permit area prior to cessation or abandonment, extent and kind of surface reclamation, and identification of backfilling, regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during temporary cessation.

3.6.9.1 Temporary Portal Seals

Co-Op will seal portals which are not to be utilized for mine inspection or access during temporary cessations of operation. These seals will be constructed of woven wire and securely attached to the portal entry so as to make trespass by men or animals prohibitive. All portals which are to be utilized will be posted with "No Trespassing" and "Keep Out" notices. Where doors exist such as fan entries, this will also be locked and signed accordingly.

APPENDIX 3.3.6

INCORPORATED UNDER
THE LAWS OF THE STATE OF UTAH



NUMBER

SHARES

Huntington-Cleveland Irrigation Company

Capital \$150,000 150,000 Shares

This Certificate that C. W. Kingston is the owner of
****Three Hundred Thirty Three and 77/100**** Shares of the Capital Stock of
Huntington-Cleveland Irrigation Company

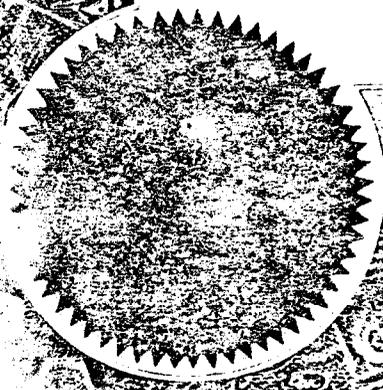
transferable only on the books of the Corporation by the holder hereof in person or by Attorney upon surrender of this Certificate properly endorsed.

IN WITNESS WHEREOF, the said Corporation has caused this Certificate to be signed
by its duly authorized officers and its Corporate Seal to be hereunto affixed
this 16 day of February A.D. 1962

[Signature]
SECRETARY

[Signature]
PRESIDENT

SHARES 100



APPENDIX 3-G

ROAD RECLAMATION PLAN

RECLAMATION PLAN

MINE PORTAL ROAD

The following procedures are designed to revegetate and control erosion. They will satisfy the commitments made by Co-Op Mining Co. in their permit application and all applicable portions under CFR 784.13. The area in question will be along and adjacent to the main mine access. The reclamation will be of a permanent nature. (See Plate 3-1). The actual ground involved comprises approximately 3 acres of disturbance.

METHODOLOGY

The actual implementation of abandonment and ultimate reclamation can be broken down into four major categories and classification of types of work needed:

- (1). Earth moving: redistribution of top soil and redistribution of road cut material to approximate original contour of surface.
- (2). Clump planting of adjacent vegetation on recontoured surface.
- (3). Seeding and mulching to re-establish interum species and reduce erosion until climax vegetation can be established.
- (4). Intermittant stream channel restoration and reconstruction of permanent drainage.

PHASE # 1 EARTH MOVING

The road system can be brought back to a reasonable configuration by implementation of a large backhoe unit. The actual method will involve the pulling of surface material from the road surface and berm and placing it against the opposing high wall. This material will then be covered with approximately 1 foot of top soil by pulling material from about 10 feet below the road cut up onto the road surface and spreading and compacting this material with the front bucket, at the same time pulling the leading edge of the high wall down to alleviate the degree and angle of the high wall. All work done both above and below the road will take into consideration existing vegetation and all effort will be made to minimize disturbance and utilize existing vegetation. When there is no alternative other than disturbance, an effort will be made to relocate earth and maintain existing vegetation in place, attempting to relocate the vegetation in the proximity of the road disturbance. (See attachment # 2).

PHASES # 2 AND 3 REVEGETATION

This procedure involves a two phase program: (1). To clump plant existing vegetation in small basins along the recontoured road, and, (2). To hydromulch the entire area to supplement revegetation and control run-off until stabilization is complete and to prepare a site which will be stable enough for a period of time to allow vegetation

to become established. The seed mix is composed of rapidly growing grasses and forbes species as well as woody species in order to stabilize and lessen the impact of surface run-off. Hydromulching to be carried out in conjunction with the earth work or Phase 1.

By this methodology, the area should be fully stocked and provide the hydrological and aesthetic commitments as detailed in mine per application. Recommendations for the hydroseeding and mulching operation are as follows:

- (1). Early spring, apply the seed simultaneously with a soil tackifier. The rate and species application as indicated. Target completion by May 1.
- (2). Then apply a wood fiber mulch with tackifier at the approximate rate of 1,500 to 2,000 pounds per acre.
- (3). Incorporate approximately 100 lbs. of 16-16-8 fertilizer in the mulch application.

PHASE # 4 DRAINAGE CHANNEL STABILIZATION AND RECONSTRUCTION

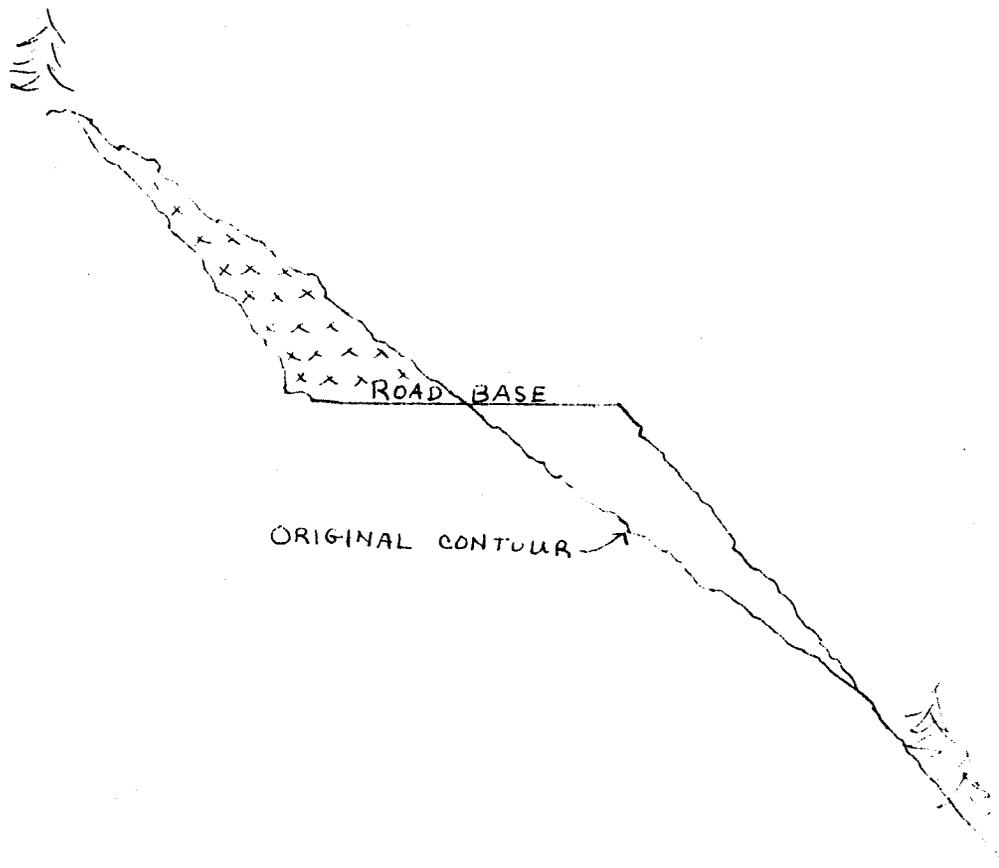
In conjunction with the recontouring, all drainage areas will re-establish to approximate original configuration. In order to minimize the loss of soil, all drainages will be lined with hygronomy blankets for approximately 10 feet above and below the areas of disturbance. In addition, where conditions warrant, rock rip rap may also be utilized to add yet another parameter of stability.

CONCLUSIONS AND RECOMMENDATIONS

The advantages of this recommended procedure are as follows:

1. By utilizing a backhoe, associated disturbance will be kept minimal.
2. The clump planting procedure accomplishes all of the below:
 - a. Immediate ground cover.
 - b. Aesthetically pleasing upon completion.
 - c. Maximize potential for native species to establish.
 - d. Inoculation of soil with indigenous mycorrhiza.
 - e. Modify and enhance the micro-environment surrounding each clump.
3. The hydroseeding, mulching, fertilization, and tackifying will virtually assure rapid establishment, thus minimizing wind and water erosion.
4. The channel liners are a proven method to eliminate erosion at the same time allowing for stabilization through revegetation.
5. A cost effective methodology to address a common problem associated with pre-law disturbance.

RECONTOURING



(Attachment #1)

APPENDIX 3.3.4.A

EXISTING STRUCTURES

EXISTING AND PROPOSED STRUCTURES

The Bear Canyon Mine has the following surface facilities:

Temporary Scale House	Fuel Storage Tanks
Truck Loadout	Oil Slack Loadout
Coal Storage Area and Stacking Facility	Shop
Crusher Facility	Non-coal Storage Yard
Principle Conveyor Structure	Power Transformer

Work commenced on all structures June of 1982 with the exception of the proposed bathhouse, phase 2 loadout, and stacking tube. (A detailed plan of these proposed structures will be provided to the Division upon final drafting.)

The location of each of the listed structures is shown on Plate 2-2. Surface Facilities. Co-Op has sought interum approval for each structure in the course of construction, the hydrologic safeguards have been implemented, top soil removed and stored, interum revegetation completed where earthwork is at final grade, and health and safety standards implemented as per MSHA standards.

All of the structures are to be reclaimed in the year 2033 and are detailed in Section 3.6.6 and 3.6.7 Bear Canyon MRP 4/30/84 submittal. In order to consolidate all previous plan submittals, current photographs were taken on 4/26/84 and are attached herein in a brief description of each facility is attached under " Facility Description" and is correlated to the representational photo. Also, Table 3.3.4.-1 lists each structure and the dates of construction, present state, etc.

FACILITY DESCRIPTIONS

(1) Temporary Scale House

This structure consists of a 12' x 50' trailer which has temporarily been utilized as a scale office. It is to be removed and replaced by a more permanent structure in 1984. At present, all environmental safeguards are in place on an interim basis and permanent structures will be implemented upon completion. See Scale House Approval letter MRP Chapter 11 (approvals). Photo (1) see schematic "A" replacement structure.

(2) Fuel Storage Tank

There are 3 10,000 gal. fuel storage tanks installed at the downslope of the shop area. These tanks are contained within a natural berm of the slope with the only access by way of the disturbed drainage ditch leading directly to the sediment pond. The pond is designed to contain any spillage which could foreseeably occur. The area will be posted "No Smoking" and fire extinguishers are in place, all MSAH safety standards will be adhered to. See photo 2.

(3) Truck Loadout Facility

The truck loadout is a conveyor system designed to load tractor-trailer trucks from any of the storage areas. It is electrically manipulated so as to minimize spillage. As each unit is loaded, the area is cleaned of spilled coal on a daily basis, and all runoff is contained. See photo 3.

(4) Shop

The shop building is for servicing of both underground and surface equipment. Major and minor repairs are implemented and it is used to inventory parts to be utilized on a continual roll over basis. The

building is heated with a coal furnace and is equipped with standard heavy equipment handling implements such as wenchers, welders, etc. See photo 4.

(5) Oil Slack Loadout

The oil slack loadout is designed to handle oiled stoker coal, primarily for non-commercial clients. It maintains a 20,000 ton storage bin with an electrical controlled auger to load small tonnages. The bin is fed via of a hopper and conveyor which is loaded by way of an end loader. See photo 5.

(6) Coal Storage and Stacking Tubes

The coal storage yard (phase 1) is equipped with a system of conveyors wherein coal can be segregated according to size and is of a short term nature where the piles are constantly being consumed and replenished. The area also contains two 6000 gallon oil storage tanks which are used to store oil for stoker coal. All run-off is controlled, and passes through the primary sediment pond. See photo 6.

(7) Crusher Facility

This facility is primarily a coal segregation site where the various sizes of coal can be separated and then stacked in the designed locations. This area is controlled run-off and is passed through the sediment pond. See photo 7.

(8) Non-Coal Storage Yard

This area is utilized for all material which is in storage on the property with projected use and or salvage value. A schematic is attached as Figure 3.8.1. Historically, the site has been utilized for this purpose and is designed with hydrologic safeguards to protect the watershed. Additional work is anticipated to upgrade the hydrolo-

logic measure upon Division approval. See photo 8.

(9) Transformer Substation

This facility is the concern of the mine's power supplier, Utah Power & Light. However, Co-Op does maintain the fence, and enforces health and environmental safeguards. Th structure is pictured on photo 9.

(10) Conveyor Structure

This conveyor is the route by which the coal exits the mine. Photo 10 pictures the conveyor in the lower tight corner, and shows the progression of coal through the various structures to the truck load-out. It is also a good overview of the property showing relative locations of each structure 1 - 8. Pictured in this photo, center top, is Co-Op's topsoil stockpile, not listed as a structure but in evidence on the surface.

Table 3.3.4.-1

Existing Structure	Construction Dates		Photo #	Reclamation Time Frame
	Beginning	Completion		
Temporary Scale House	10/1982	11/1983	1	replace in 1985
Fuel Storage Tanks	10/1983	6/1984	2	2033
Truck Loadout	9/1982	4/1983	3	2033
Shop	10/1983	9/1984	4	2033
Oil Slack Loadout	4/1983	7/1983	5	2033
Coal Storage & Stacking	6/1980	4/1983	6	2033
Crusher Facility	4/1980	12/1985	7	2033
Non-coal Storage Yd.	3/1980	9/1984	8	2033
Transformer Substation	4/1980	6/1980	9	2033
Conveyor Structure	3/1980	6/1980	10	2033
New Scale House (Modification approved) See Chapter 11	6/1984	10/1986		

Proposed Structure (Plans to be submitted prior to construction)

Bath House	8/1984	11/1984		
Stacking Tube & Load-out (2nd Phase)	4/1986	10/1986		

ADDENDUM TO: SEWAGE WASTE DISPOSAL AND HANDLING FACILITY
BEAR CANYON SCALE HOUSE - BEAR CANYON MINE

RE: letter 09/08/83 received
Co-op 09/29/83 State
of Utah, Department of
Health

2. More detail must be provided on the proposed lift station:
 - a. Details of the lift station construction must be provided, ie., height, materials of construction, construction details etc., of the lift station wet well.

Co-op Reply:

The wet well will be constructed of 60 inch concrete culvert, 135 emulsion will be applied on both the inside and outside of the cylinder to an approximate thickness of 1/8th inch. The six ft. section of culvert will be set 4 inches into a 52" x 10" concrete pad (see Figure 2). The culvert will then be backfilled with sand to a depth of 5'6" leaving approximately 6" of the culvert end extending above the surface. A 4"

metal line from the 2,500 gal. septic tank will be welded into the 36" culvert at this point, a 3" metal line will be sealed at the same elevation on the opposing side (See figure 2). A 6" x 6' x 6' concrete pad will then be poured around the top of the culvert. A 2" depression to accomodate a conventional 60" manhole cover will be formed in place. See consturction diagram (Figure 3).

- b. Details of the switches which will be used to activate pump and warning light must be provided.

Co-op Reply:

(See Figure 4)

- c. The proximity of the lift station to the stream should be provided./Also provisions which would prevent waste water (if the lift station should flood) from entering the stream should be shown.

Co-op Reply

The wet well will be approximately 15 feet horizontal distance from the existing stream channel. However, Co-op is presently permitting a 200' 60" culvert that will seal this stretch of stream off for a minimum of 50' below the area of the well. In ad-

dition, the drainage from the entire pad area is designed to drain to the catch basin which will further ensure the integrity of the stream.

- d. Details of the screen over the lift station discharge line should be presented.

Co-op Reply:

A standard 100 mesh screen is provided on the intake portion of the pump unit. This, in combination with the 3 screen inlet pipe to the well, should maintain a relatively clear debris-free fluid in the well as well as the pump.

- e. Details of the cover for the lift station should be provided.

Co-op Reply:

The cover is simply a standard 36" man-hole cover as provided by W. R. White Pipe Company of Price, UT.

- f. Details of the lift station pump should be provided to ensure it is of adequate capacity and suitable for this application.

Co-op Reply:

If anything, a 200 gpm trash pump is oversized to accomodate a 300 gal. wet well, however, Co-op has contacted 3 pump manufacturers with the request for specifications and pricing. When a decision is reached, a set of specifications for the pump will be supplied to the Dept. of Health for the review and approval prior to purchase and/or installation.

3. The details of the 3 inch diameter sewer pipe crossing Bear Creek should be provided. These details should include relative elevation of the crossing pipe to the creek bottom, what type of pipe will be used, will the pipe be encased and if so what type of pipe will be used etc.

Co-op Reply:

3" PVC schedual 240# pipe will be installed at a depth of 40" - 48" at 10" from intersecting the 60" concrete culverted creek. This pipe will be run through a 6" PVC pipe for a distance of 40' which will by-pass the 60" culverted creek by a minimum of 10'.

APPENDIX 3.3.6 A



STATE OF UTAH
NATURAL RESOURCES & ENERGY
Water Rights

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dee C. Hansen, State Engineer

74 West Main Street • P.O. Box 718 • Price, UT 84501 • 801-637-1303

September 30, 1983

Division of Oil, Gas and Mining
Attn: Joseph C. Helfrich
4241 State Office Building
Salt Lake City, Utah 84114

Dear Mr. Helfrich:

At the request of Mr. Melvin Coonrod, consultant for Co-op Mining Company, please be advised that the above mentioned company has filed Change Application No. a-12921 (93-1067), of which a copy is enclosed, requesting the right to withdraw up to 0.25 sec.-ft. of water from a mine tunnel in Bear Canyon located at a point: N. 79 ft. & E. 75 ft. from the SW Cor. Sec. 26, T16S, R7E, SLB&M. It is proposed to use the water for mining and irrigation purposes within the SE $\frac{1}{4}$, NE $\frac{1}{4}$, T16S, R7E, SLB&M.

The change application was filed with this office on September 2, 1983. Normal processing time for such a request is 90-120 days, provided that there are no protests filed.

I trust that this brief explanation will help clarify their present water rights status. If I can assist further in any way please feel free to call on me.

Sincerely,

Mark P. Page
Area Engineer

cc: Melvin Coonrod
Co-op Mining Company

Enclosure

IN THE SEVENTH JUDICIAL DISTRICT COURT, IN AND FOR THE
COUNTY OF EMERY STATE OF UTAH

IN THE MATTER OF THE GENERAL DETERMINATION
OF RIGHTS TO THE USE OF ALL WATER BOTH SURFACE
AND UNDERGROUND WITHIN THE DRAINAGE AREA OF THE
SAN RAFAEL RIVER IN SANPETE AND EMERY COUNTIES
IN UTAH.

STATEMENT OF WATER
USER'S CLAIM

CODE NO. SERIAL NO.

93 1067

MAP NO. 21

NOTE: This blank is sent to you in accordance with Utah Law. The information called for herein will be used in connection with the adjudication of water rights on the above mentioned drainage area. All questions applicable to your claim must be answered fully, and one copy of this form must be filed with the Clerk of the District Court at

Castle Dale, Utah, within sixty (60) days from date of service of the attached Notice. A copy shall be filed with the State Engineer, State Capitol, Salt Lake City. Failure to file the attached Statement of the Water User's Claim with the Clerk of the District Court within the time stated will forever bar and estop you from asserting any right to the use of water from said drainage area.

- Name of Claimant Charles W. Kingston
862 East Garfield Avenue Interest Claimed Full
- Address Salt Lake City, Utah 84110
- Name of particular spring, spring area, stream, well, tunnel or drain from which water is diverted is Underground Water (Mine Tunnel) in Emery County.
- Priority date claimed January 20, 1964 Date when water was first used
Date when work on diverting system was first begun _____ Date when diverting system was completed _____
Nature of work _____
- Class of Right (Indicate by X):
(a) _____ Right to surface water initiated by beneficial use before 1903 Claim No. _____
(b) _____ Right to underground water initiated before 1935 Claim No. _____
(c) _____ Right decreed by court, cite title of case _____
(d) Application filed, State Engineer's Office No. 35836 Cert. of App. No. Election
(e) _____ Right acquired by adverse use prior to 1939 Chng. n-6330
- Nature (Indicate by X), Amount, and Annual Period of Use (by month & day):
(a) Irrigation Sec. Ft. INC. from April 1 to October 31 (both dates incl.)
(b) _____ Stockwatering Sec. Ft. _____ from _____ to _____ (both dates incl.)
(c) _____ Domestic Sec. Ft. _____ from _____ to _____ (both dates incl.)
(d) _____ Municipal Sec. Ft. _____ from _____ to _____ (both dates incl.)
(e) Mining Sec. Ft. 0.25 from January 1 to December 31 (both dates incl.)
- Direct Flow Appropriation (must be described with reference to U. S. Government Survey Corner)
(a) Point of diversion from ~~XXXXXX~~ tunnel ~~XXXX~~ N. 210 ft. & W. 320 ft. from E 1/4 Cor. Sec. 22, T16S, R7E, S16&M.
(b) Description of spring area _____
(c) Point of redirection or point of return to natural channel _____
(d) If flow is intermittently diverted, list by number or description, all rights involved _____
- Where water is used for irrigation purposes:
(a) Area irrigated in legal subdivisions of land by 40-acre tract. (All sources of water for same land or lands must be described in each instance by name or claim number). CLAIMS USED FOR PURPOSE DESCRIBED:
93-1067 on: 0.5 acre in SE 1/4 Sec. 22, T16S, R7E, S16&M.
(b) Do you get water under a ditch owned by several users _____ If so, give names of all users and divisions of interest _____
- Where water is used for Stockwatering:
(a) Number of each kind of stock watered _____
(b) All sources of water for same stock. (Describe by name or claim number) _____
- Where water is used for Domestic:
(a) Number of families or their equivalent _____ All sources of water for same use.
(Describe by name or claim number) _____

APPLICATION FOR THE RIGHT OF EXCHANGE OF WATER STATE OF UTAH

For the purpose of obtaining permission to make an exchange of water, application is hereby made to State Engineer, based upon the following showing of facts submitted in accordance with the requirements of Sec. 73-3-20, Utah Code Annotated, 1953.

1. The name of the applicant is r. Mrs. Charles W. (Lavenda) Kingston
2. The post office address of the applicant is 862 E. Garfield Ave. SLC, Ut. 84110
3. The right to be exchanged was acquired by Application No. 35836 (93-1067)
(Give application No., certificate No., Decree, stock purchase, or other identification.)
4. The quantity of water is 0.25 second-feet, or _____ acre-feet.
5. The period of use from January 1 to December 31, inc.
(Month) (Day) (Month) (Day)
6. The period of storage from _____ to _____, inc.
(Month) (Day) (Month) (Day)
7. The direct source of supply is Tunnel tributary to _____
in Emery county.
8. The point of diversion is* N 210' & W 320' from E 1/4 Cor. Sec. 22, T16S, R7E, SLM
9. The water is, or was, to be used for the following purposes:
Irrigation SE 1/4 ne 1/4 Sec. 22, T16S, R7E, SLM
Mining
_____, Total 10 acres.
(Give place of use by legal subdivision of land)

THE FOLLOWING EXCHANGE IS PROPOSED

10. 0.25 second-feet or _____ acre-feet of water represented by the foregoing right will be delivered from January 1 to December 31 incl. of each
(Month) (Day) (Month) (Day) year, to satisfy other rights, into _____ at a point*
N79' & E75' from the SW cor. Sec. 24 T16 R7E SLM
11. In exchange for the water delivered and described in par. 10, there will be _____ second-feet or _____ acre-feet diverted from _____ to _____
(Month) (Day) (Month) (Day) incl., of each year from a well _____
(diameter and depth) or stream _____, at a point* _____
12. The water will be used for _____
Irrigation
Mining, Total 10 acres.

NOTE: *The point of diversion, point of return or point of delivery must be located by course and distance or by rectangular distances with reference to some United States land survey corner.*

APPENDIX 3.3.11 - A

AGREEMENT

This agreement made and entered into this 3rd day of August 1983, by and between Emery County, a body corporate and politic (County), and Co-Op Mining Company, a Utah general partnership (Co-Op),

WHEREAS, there is an existing road in Emery County known as Bear Creek Road, and

WHEREAS, Co-Op requires extensive use of said road, and

WHEREAS, due to said extensive use, said road should be relocated for the health, safety and welfare of the citizens of County as well as others who may have occasion to use said road,

NOW, THEREFORE, be it agreed as follows:

1. The parties hereto agree and acknowledge that the southern 0.65 miles of the road known as Bear Creek Road is a County road. Said County road runs from State Road 31 in a northerly direction for approximately 0.65 miles to a presently existing gate. Thereafter the road is a private road.
2. That Co-Op will relocate the Bear Creek Road according to the plans and specifications prepared by the Emery County Engineer and described on the document entitled Bear Canyon County Road Relocation dated October 12, 1982.
3. Co-Op will relocate the Road according to the plans and specifications referred to above at their expense. Co-Op will reimburse County for engineering costs incurred by County concerning the preparation of said plans and specifications and site inspections up to One Thousand (\$1,000.00) Dollars.
4. Co-Op will indemnify and defend County for any damage caused, or loss incurred to or claim made by any public or private individual, firm, group, association, partnership or corporation as a result of the construction conducted to relocate Bear Creek Road. Said indemnification will continue until such time as County approves the completed roadway and accepts the construction thereof.
5. Co-Op acknowledges and accepts the easements of North Emery Water Users and Huntington City which exist in, along and across the relocate Bear Creek Road. Said easements are in existence on the ground. Co-Op's acknowledgment thereof herein recognizes and preserves said easements.
6. Co-Op agrees to encase water lines of North Emery Water Users and Huntington City in nestable corrugated pipe pursuant to plans and specifications prepared by the Emery County Engineer.

7. Co-Op agrees to allow access to other property served by the relocated Bear Creek Road. Said access shall be allowed to the owner of the property, their successor in interest or any other individual, firm, group, association, partnership or corporation who requires access due to their association with the owner or because the owner has granted permission to the individual, firm, group, association, partnership or corporation to go upon his property. Co-Op will not withhold access due to the type of activity which the then owner or his agents, employees or invitees intend or in fact conduct.

8. Co-Op will provide a completion and performance bond to Emery County upon the execution hereof in the amount of Twenty-Five Thousand (\$25,000.00) Dollars which will remain in force and effect for twelve (12) months after the date said road is accepted by County as indicated in paragraph 4 above.

9. Co-Op will provide liability insurance in an amount not less than Five Hundred Thousand (\$500,000.00) Dollars to be in force during the construction of said road. Said policy will name County as an insured.

10. Co-Op agrees to complete said road in a timely manner not to exceed eighteen (18) months from the date of this agreement. County may make demand upon the bonding company under the bond provided pursuant to paragraph 8 above and secure completion of the relocation in the event construction is not completed within the agreed upon eighteen (18) months.

11. It is further understood that any additional improvements of the relocated Bear Creek Road will be at the expense of all primary users.

12. The Co-Op agrees to reclaim that portion of the old Bear Creek Road according to the specifications and requirements of the Bureau of Land Manager (BLM).

13. That the Co-Op agrees to provide Emery County with the necessary easement agreements with the Utah Department of Transportation.

14. Co-Op acknowledges and agrees to comply with standard number 6.3.8 "Protection Zone" of the Utah State Health Drinking Water Standards as it applies to supplies of drinking water in Bear Canyon.

15. County agrees to inspect the relocated Bear Creek Road within ten (10) days after notification by Co-Op of the completion thereof. County must within five (5) working days of said inspection accept the road or notify Co-Op of any deficiencies which must be then corrected by Co-Op within the time period outlined in paragraph 10 above. Should County fail to notify Co-Op of any deficiencies within five (5) working days, the road is deemed accepted by County and the twelve (12) month period indicated in paragraph 8 above begins to run from the sixth (6th) day after inspection.

IN WITNESS WHEREOF, this agreement is executed the day and year above first written, at Castle Dale, Utah, pursuant to a resolution of the Emery County Board of Commissioners at a regularly scheduled meeting of the Board.

EMERY COUNTY, a body politic and corporate,

ATTEST

Bruce A. Smith
County Clerk

By *Ree P. Ware*
Chairman of the Emery County
Board of Commissioners

IN WITNESS WHEREOF this agreement is executed at Huntington, Utah.

DATED this *3rd* day of *August*, 1983.

CO-OP MINING COMPANY, a Utah general partnership

By *B. Stoddard*
a General Partner

CO-OP MINING CO.
BOX 1245
HUNTINGTON, UTAH 84528

Aug. 8, 1983

S U B M I T T A L

TO:

DIVISION OF OIL GAS AND MINING
4241 STATE OFFICE BUILDING
SALT LAKE CITY, UTAH 84114

RECEIVED
AUG 08 1983

DIVISION OF
OIL GAS & MINING

Co-op Mining Co. submits the following plans for that portion of the haul road in the Bear Creek Canyon designated as a private road in the enclosed copy of the agreement between Emery County and Co-op Mining Co. The road coincides with the existing Bear Canyon road, which follows the original contour of the land, minimizing additional disturbance or adverse effects on the environment. There will be no cut or fill sections, and no material side-cast. If any new area is disturbed, any suitable topsoil will first be removed and stockpiled as described in the topsoil plan previously submitted. At the time of final reclamation, the road will be reclaimed as outlined in the previously submitted reclamation plan, unless it is determined to be necessary for post mining land use. Hydrology for the drainage controls has been calculated by Horrocks Engineers (See appendage A). Culverts will be galvanized corrugated type.

Please see enclosed map, profile, and cross-section for construction detail. (Plate 3-5)

CO-OP MINING COMPANY

Wendell Owen

WENDELL OWEN

APPENDIX 3 - B

Coal Mine Safety and Health
District 9

March 1, 1983

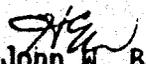
Mr. B. W. Stoddard
General Superintendent
Co-op Mining Company
P. O. Box 300
Huntington, UT 84528

Re: Bear Canyon Mine
I. D. No. 42-01697
Roof Control Plan

Dear Mr. Stoddard:

The roof control plan dated January 7, 1983, has been reviewed by MSHA personnel and is approved. As required by 30 CFR, 75.200, the plan shall be reviewed by MSHA every six months.

Sincerely,


John W. Barton
District Manager

JWB:J.S.Miller:mh

cc: Price
Orangeville
DTSC
State

ROOF CONTROL PLAN
General Information

Date 1-7-83 Mine I.D. No. 42-01697

A. Company Co-op Mining Co.

Address P.O. Box 15309 Salt Lake City, Utah 84115
city state

B. Mine Bear Canyon #1

Mine Location

Huntington Emery Utah
city county state

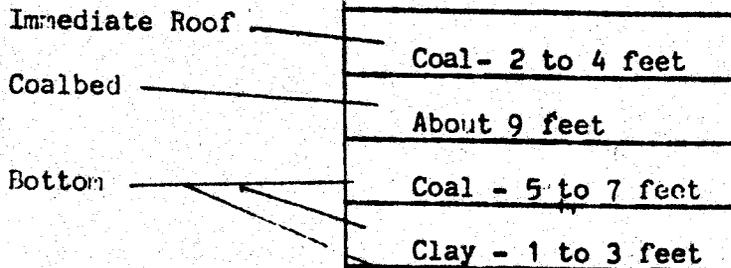
C. Location (reference to nearest highway route, direction, and distance)
2 Miles East Off Route No. 31

D. Type(s) of plan Spot Bolting Plan

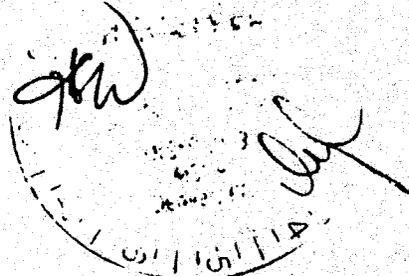
E. Area(s) of mine covered by the plan Development of entries,
rooms and crosscuts

F. Maximum cover: 1700 Feet

Main Roof — — — Sandstone — — Up to 80 ft. thick



Sandstone — — Up to 60 feet



G. BW Stalder Gen Supt. 1-7-83
Company Official's Signature Title Date

Roof Control Investigator _____

The Roof Control Plan approved this date hereby supersedes all previously approved plans

Approved by _____ Date _____

Title _____

ROOF SUPPORT MATERIALS FOR RESIN GROUTED RODS

RODS Manufacturer's
Manufacturer Birmingham Designation 6 or 7 x 12
OR EQUIVELANT
Minimum Length 72" Diameter 3/4 or 7/8
Type Steel #40 rebar Type Head square
Minimum Yield 40,000 lbs.
Dimensions of Rod: Head 1 1/8" Flange 1 7/8"

BEARING PLATES

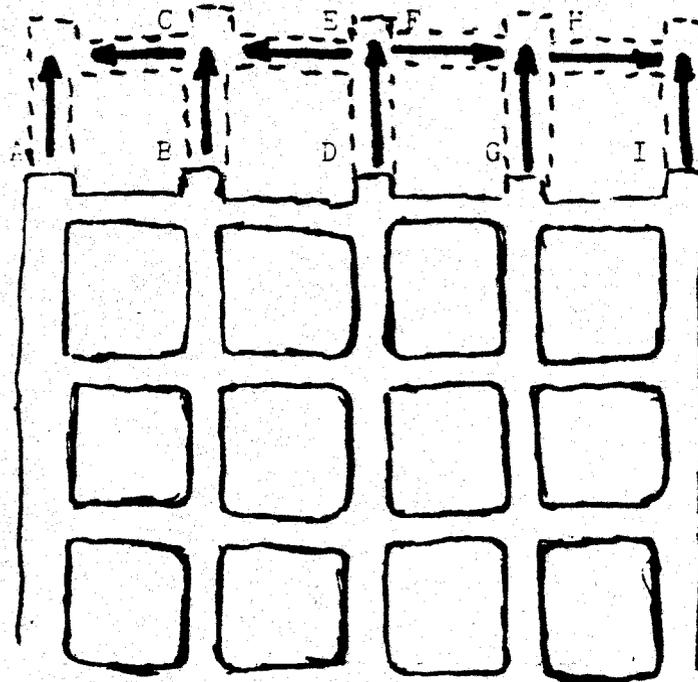
Dimensions Generally 1/2 x 6" x 6"
Shape Embossed or dished Center Hole Size approx. 7/8"

RESIN

Manufacturer's
Manufacturer Celtite Designation roof bolt cartridge
or equivalent
Type IV Size of
Finishing Bit 1" #030

Prior approval shall be obtained before making any changes in the materials listed.

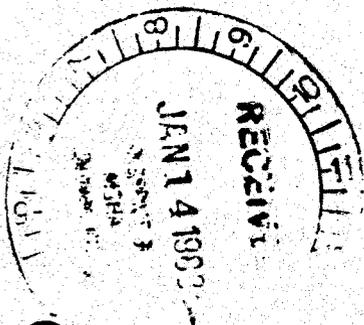
Sketch #1



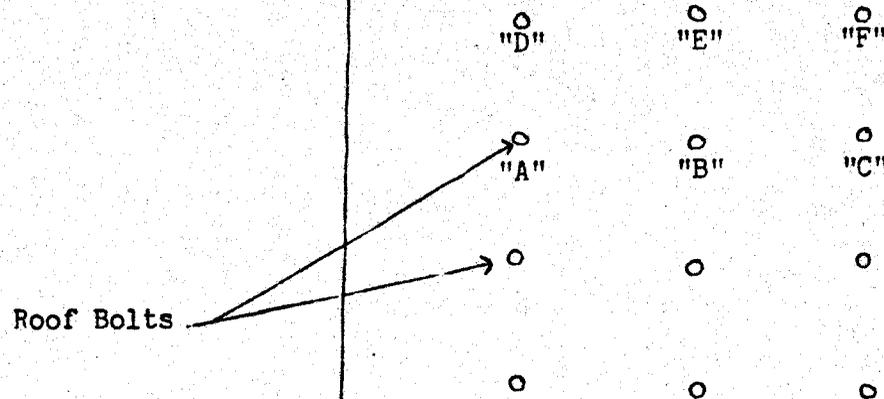
Sequence of Mining
Bear Canyon #1
Roof Control

Typical Section Mining Sequence

Starting on the far right (A), the entry or room is advanced the designated distance. Then the miner pulls back to (B) and this entry or room is advanced same as "A". Then a crosscut (C) is made to join A and B. The miner then pulls back to (D) and this entry or room is advanced same as "B" at this time a crosscut (E) is turned to the left to join B and D then one is turned to the right (F). The miner pulls back to (G) and this entry or room then advances to crosscut (F), then a crosscut (H) is turned to the right. The miner is then moved to (I) and this entry or room is advanced to crosscut (H). This sequence is then repeated.

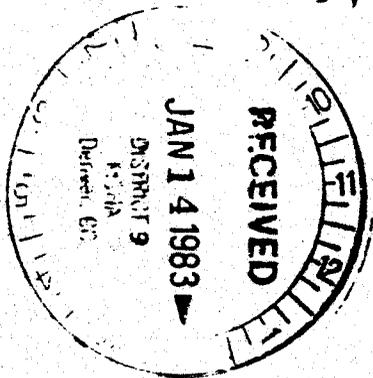


Bolting Sequence
 Bear Canyon #1
 Roof Control



Typical Sequence of Installing Bolts

Bolts are installed on 5 foot centers. Bolts are installed from left to right. Starting from "A" to "B" to "C", then the sequence follow as in "D", "E" and "F".



SAFETY PRECAUTIONS FOR A SPOT BOLTING PLAN

1. For the purpose of this plan, where the roof is strong and competent, as determined by a responsible person of higher authority than the section foreman, an entry may be advanced a maximum of 120 feet prior to roof bolting. Adjoining crosscuts may be run in addition to entries prior to roof bolting. A written record that defines the approved area and is dated and signed by the responsible official shall be kept in a book that is available for examination by interested persons.
2. In the absence of properly recorded approval as described above, an area is to be fully supported. All active faces in a section in an approved area shall automatically revert to a full overhead support if: (a) a roof fall occurs in or in by the last open crosscut in an active section; (b) roof bolts (or crossbars) are installed or needed for a distance in excess of 16 linear feet within such area; or (c) roof bolts (or crossbars) are installed or needed frequently in the general area, regardless of the distance supported in each instance. The official immediately responsible for the area shall report such change to the mine foreman; and the mine foreman shall record the loss of approval for the area in the aforesaid record book. The area may be re-approved per preceding paragraph.

U. S. Department of Labor

Mine Safety and Health Administration
P O Box 25367
Denver, Colorado 80225
Coal Mine Safety & Health
District 9



September 19, 1983

Mr. B. W. Stoddard
Operator
Co-op Mining Company
P.O. Box 300
Huntington, UT 84528

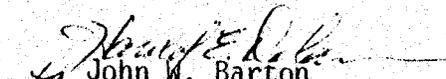
Re: Bear Canyon No. 1 Mine, I.D. No. 42-01697
Six Month Review of Roof Control Plan with
Pillar Extraction Addendum

Dear Mr. Stoddard:

In regard to your requested addendum, dated September 11, 1983, pursuant to your pillar extraction plan, it has been reviewed by MSHA personnel and is approved.

Your currently approved roof control plan with the pillar extraction addendum has been reviewed by this office and appears to be satisfactory and is approved. This plan supercedes all previously approved roof control plans. As required by 30 CFR, 75.200, the approved plan will remain in effect for another six months. If future conditions warrant, the plan may have to be changed.

Sincerely,


John W. Barton
District Manager

Enclosure

M. Hev

Co-op Mining Company
Bear Canyon No. 1
P.O. Box 300
Huntinton, Utah 84528

U.S. Department of Labor
Mine Safety and Health Administration
Coal Mine Safety and Health
P.O. Box 25367
Denver, Colorado 80225
District 2

9-11-83

Dear Sir;

Please find enclosed a plan and sketches for roof control during pillar extraction. This is the same system we used in the old Co-op Mine I.D. No. 42-00081. Although pillar extraction conditions were far worse in the Co-op Mine we had real good results in safety and clear caves while using this system. Because of these reasons we feel this a safe plan to use in Bear Canyon No. 1.

This plan is an addition to the Roof Control Plan already in effect at the Bear Canyon No.1 Mine I.D. No. 42-01697.

If there are any questions please contact Bill Stoddard At 801-740-2777.

Thank You;

Operator

BW Stoddard
B.W. Stoddard

9.14.83
Hev

TYPICAL ROOF CONTROL FOR PILLAR EXTRACTION

The following roof control plan is formulated for roof control during pillar recovery and is an addition to the roof control plan already in effect at the Bear Canyon #1 Mine I.D. No. 42-01697.

A. The plan now in effect is a minimum roof control plan and was formulated for normal roof conditions. Normal roof conditions means leaving 2 ft. to 4 ft. of top coal as the immediate roof. Because the immediate roof is coal, under normal conditions no roof support need be used while developing rooms.

B. This is a typical pillar extraction plan and is a general outline to follow. Any variation from this plan would be no less safe than the one given here.

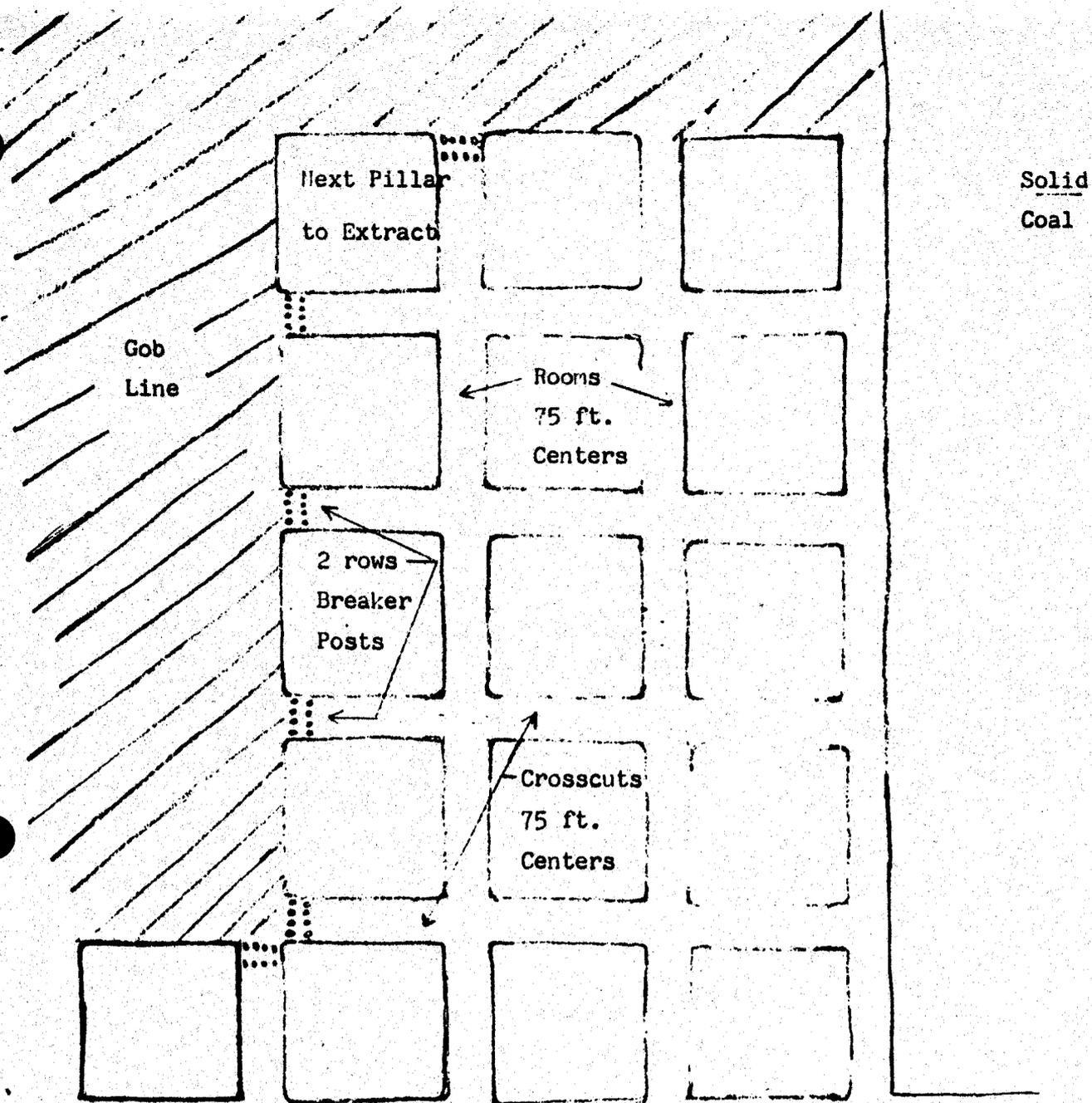
1. Rooms are run on 75 ft. centers and are 18 ft. to 20 ft. wide. crosscuts are run on 75 ft. centers and are run 18 ft. to 20 ft. wide. The total coal seam is about 19 ft. high. Rooms and crosscuts are developed about 9 ft. high. Four ft. of top coal is left for safe roof. About 6 ft. of bottom coal is left and this coal will be extracted with the pillars.

2. Two rows of breaker posts are set on 4 ft. centers across each opening leading into pillared areas. Such posts are installed near the breakline between the split being started and the gob. See sketch #1.

3. A row of turn posts set on 5 ft. centers will be installed leading into each pillar split. When this split is through the pillar 2 rows of breaker posts are installed next to the gob. Another set of turn posts is installed and the fender is split. A row of breaker posts is

set at the end of this split and the far stump is reduced in size enough to allow a cave. The close stump is then reduced enough to allow a cave. The remaining fender is mined from the crosscut in the same manner. It should be noted that if additional posts are needed they will be used. See sketch No's 2,3,4, and 5 for explanation of extracting a pillar.

4. The size of the posts being used will be not less than 6 inches in diameter. All posts shall be topped with a wooden cap piece. These cap pieces will not be less than 3" x 6" x 24" in size. Posts will be installed tight and on solid footing. Not more than two wooden wedges should be used to install a post.



ROOF CONTROL WHILE EXTRACTING PILLARS

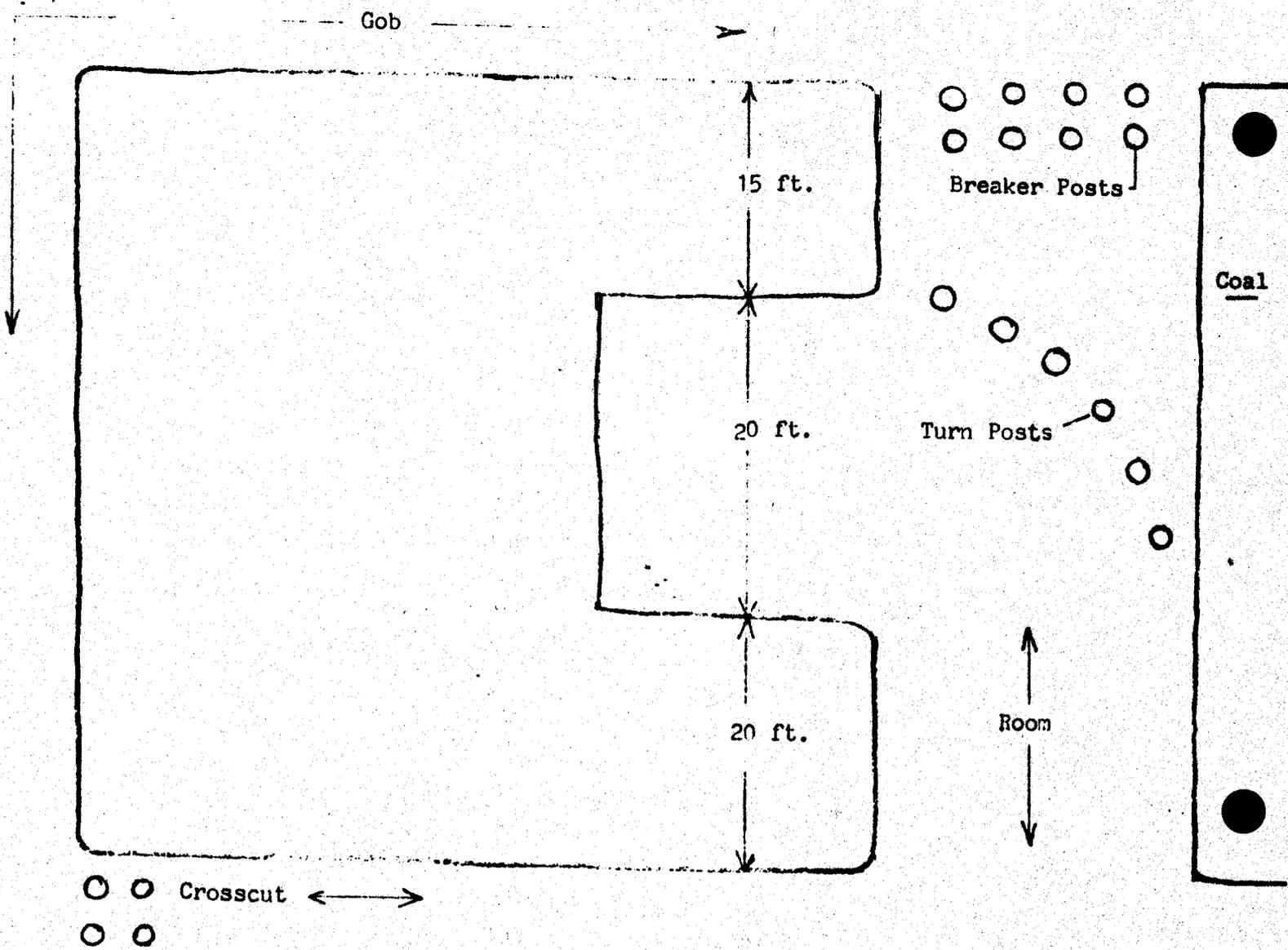
Two rows of breaker posts are set on 4 ft. centers across each opening leading into pillard areas. Such posts are installed near the break-line between the split being started and the gob.

Sketch No. 1

Bear Canyon No. 1

Mine I.D. No. 42-01697

Co-op Mining Co.



ROOF CONTROL WHILE EXTRACTING PILLARS
Starting Pillar Splits

Two rows of breaker posts are set on 4 ft. centers next to the gob line in both the room and crosscut. A row of turn posts is set on 5 ft. centers near the split being started. Pillars are approximately 55 feet square. The split is about 20 ft. wide leaving about a 15 ft. fender next to the gob and 20 ft. next to the crosscut.

Sketch No. 2
Bear Canyon No. 1
Mine I.D. No. 42-01697
Co-op Mining Co.

APPENDIX 3 - C

Appendix 3-C

APPROVED INTERIM RECLAMATION PLAN

Scope

The following procedures are designed to revegetate and control erosion. They will to a large degree satisfy the commitments made by the Co-op Mining Company in their permit while also satisfying OSM regulations as pertaining to wildlife concerns and interim reclamation for those areas which will be utilized during mining operations.

The areas in question are along and adjacent to the coal stockpile and the topsoil storage pile and are of a contemporaneous nature.

The actual ground involved comprises approximately 1.6 acres of disturbed land primarily deck slope disturbance and the topsoil pile. (See Plate 3-2 Map). The actual procedures involve a two phase program: (1) Earthwork to prepare a site which will be stable enough for a period of time to allow vegetation to become established, (2) Hydroseed and

mulch the entire area to supplement revegetation and control runoff until stabilization is complete.

METHODOLOGY

Phase 1 - Earth Moving

The pad down slopes will be brought back to a reasonable configuration by implementation of a crawler tractor. The actual method will involve smooth contouring of the existing soil and walking the crawler up and down the slope attempting to minimize compaction while at the same time creating small indentations by the grouser on the track. This methodology creates an enhanced micro-climate for the establishment of seed and guarantees sufficient compaction as to assure integrity and stability of embankment and prohibit failure.

Phase 2 - Seeding and Mulching

The entire area of disturbance will be hydroseeded during October, 1983. The seed mix and rate of application is attached. Hydro-seeding and mulching will be carried out in conjunction with the earth work of Phase 1. Recommendations for the hydroseeding and mulching operation are as follows:

This methodology involves the use of a hydro-seeder to apply the seed and tac to all disturbed areas and then to overspray the seeding with a wood-fiber mulch (approximately 2,000 lbs. per acre, long fiber) in combination with fertilizer and additional tacifying agents.

Co-op will follow the above recommendations.

The following rates of material should be utilized:

(Rates of tac were developed with respect to velocity and erosive power of water which is proportional to the square root of the slope). An empirical factor was determined from laboratory and field studies to arrive at the minimum tac to fiber ratio. Thus, 60 pounds of tac per ton of fiber is about minimum for slopes up to 20% and the empirical factor is determined as $60 \div 25\% = 12$. A 25% slope is about maximum for the minimum amount of tac. For a 100% slope (1 : 1 or 45) the ratio of tac to fiber is calculated as:

SUGGESTED RATIOS OF TAC TO FIBER FOR HYDRO-SEEDING
AND HYDRO-MULCHING TO SERVE AS MULCH OR SOIL BINDER

<u>SLOPE ANGLE</u>	<u>SLOPE RATIO</u>	<u>PERCENT SLOPE</u>	<u>LBS. TAC Per Ton FIBER</u>	<u>RATIO TAC TO FIBER</u>
	Rise:Run			
14°	1 : 4	25%	60 (min.)	1 : 30
26°	1 : 2	50%	80	1 : 25
33°	1 : 1½	66%	100	1 : 20
45°	1 : 1	100%	120	1 : 16
57°	1½ : 1	150%	140	1 : 14
64°	2 : 1	200%	160 (min.)	1 : 12

RECOMMENDED SEED MIX FOR INTERIM RECLAMATION

BEAR CANYON MINE

CO-OP MINING COMPANY

SPECIES RATE PER ACRE
HYDROSEED

GRASSES

<u>Agropyron dasystachyum</u>	6
Thickspike Wheatgrass	
<u>A. spicatum</u>	8
Bluebunch Wheatgrass	
<u>Elymus Salina</u>	
Salina Wildrye	1.5
<u>Oryzopsis hymenoides</u>	3
Indian Ricegrass	
<u>Poa secunda</u>	2
Sandberg Bluegrass	

FORBS

Ladak Alfalfa	2
Yellow Sweet Clover	2

COVER CROP

Oats	20
------	----

SEC R5

DRAINAGE

SEPTIC TANK
7115.5

TANK BERM

FUEL TANKS

1.3 acres

Co-op Mining Co
Bear Canyon Mine
PLATE R-1

CONTEMPORANEOUS
RECLAMATION
Fall 1983

EXPOSED
SUPPORT

TOP SOIL
Stockpile

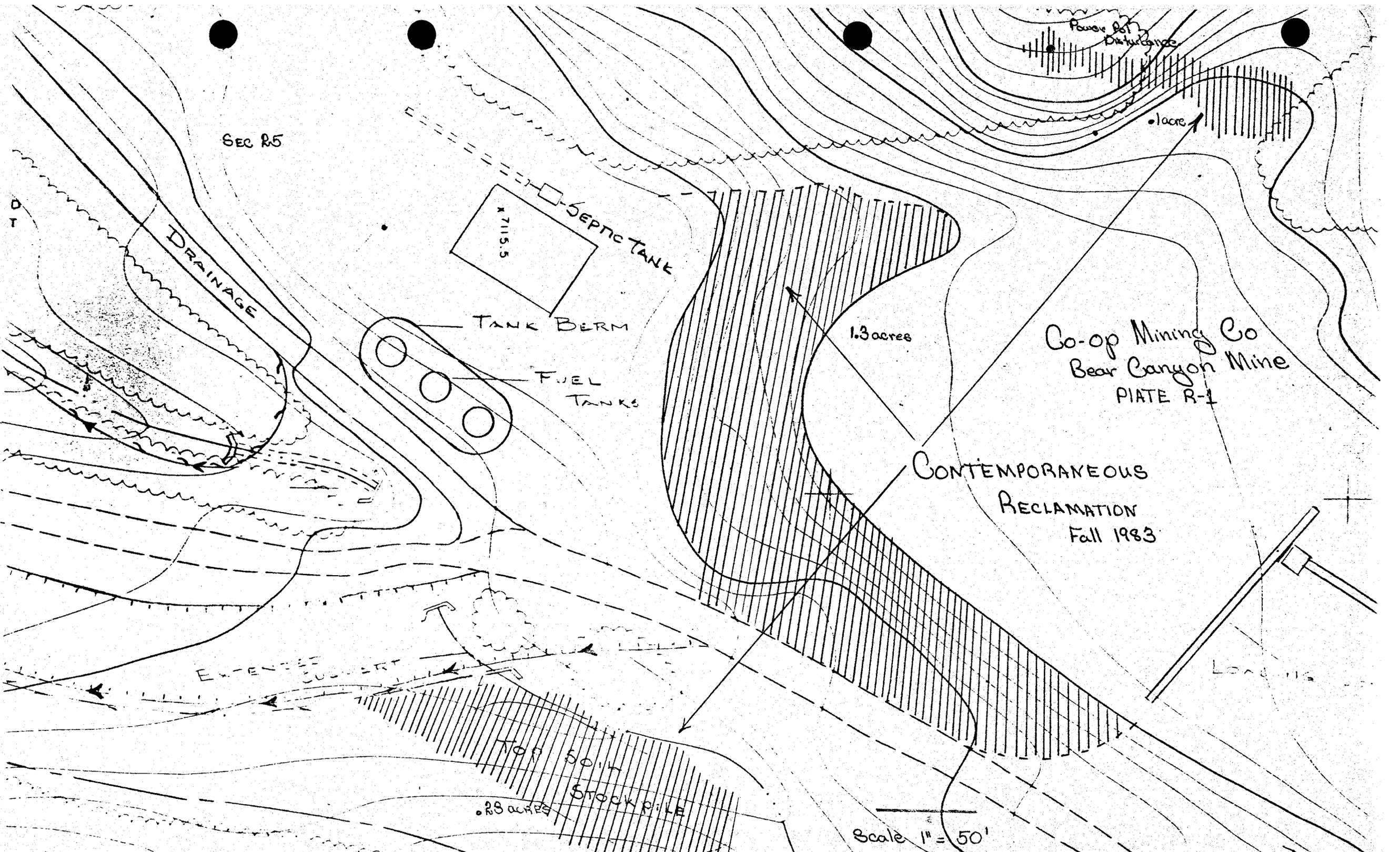
0.28 acres

Scale 1" = 50'

Power Lot
Disturbance

1 acre

LOADING



APPENDIX 3 - D

CO-OP MINING CO.

P.O. Box 15809
Salt Lake City, Utah 84115
Phone (801) 467-4003

June 24, 1983

TOPSOIL STOCKPILE CONSOLIDATION

Bear Canyon Mine

The following plan for handling of topsoil and consolidation of piles to one storage area has been prepared for Co-op Mining Company by Mel Coonrod. Please refer to the request made by Co-op Mining Company on June 1, 1983 and the subsequent visit to the minesite by Ev Hooper and John Whitehead to discuss possible storage sites.

Co-op Mining Company

Wendell Owen



SOILS, PHYSICAL AND CHEMICAL PROPERTIES OF SOILS; RESULTS OF ANALYSIS,
TESTS, TRIALS AND INTERIM RECLAMATION PLAN.

The 1982 Co-op field investigations provided information on the physical and chemical properties of soils in the permit area. A Soils Legend will be included for each soil in a map unit [Attachment 3A]. A rating for topsoil is included on this form, as are some chemical properties. In studies during the 1982 field season an onsite sampling was analyzed for the required chemical properties in all horizons [see Attachment 1-A].

SOIL SUBSTITUTE OR SUPPLEMENT

Not applicable.

SOIL REMOVAL, HANDLING, STORAGE, AND PROTECTION PLANS

To prevent suitable topsoil from being wasted or contaminated by waste materials, topsoil was removed from all new construction areas as a separate operation. The topsoil was stockpiled and will be consolidated and protected from wind and water erosion and contamination which might lessen its capability to support vegetation. The following subsections deal specifically with the various phases of the topsoil and subsoil handling plan.

Topsoil Removal

At the start of the construction phase, topsoil was collected from the area. Existing vegetation was removed and topsoil was collected prior to excavation or other surface disturbance operations within the affected areas.

The depth of topsoil removal in each case depends on the amount of A and B horizon material as defined in OSM Regulation 30 CFR 783.21 and 783.22. The topsoil removed in these areas consists of A horizon quality material

and B horizon quality material with virtually no distinctive difference. The C horizon material was not removed since it was not sufficiently capable of supporting diverse vegetation do to the excessive rock.

The equipment used for topsoil removal consisted of bulldozers, front-end loaders, and dump trucks. The use of bulldozers requires pushing of the topsoil to a collection point for loading into dump trucks or other means of transportation to the designated stockpile. Adequate supervisory personnel were present at the time of topsoil removal to instruct the equipment operators in the proper techniques of topsoil removal and to ensure that required horizons were removed and stored.

Topsoil Stockpile

Topsoil is presently being stored within areas of the permit boundary [see Map 1]. It is the Co-op intent to consolidate Pile #3 with Pile #4; to utilize Pile #2 which is principally rock and unsuitable as a growth media as rip-rap where ever the need arises; and to relocate Pile #1 which is primarily rock to the site of Pile #4 to be used as a top dressing upon final reclamation.

Plans involving topsoil storage can be labeled as "short term" or "long term" depending on completion of activities in each area and the reclamation schedule presented. These piles should be considered "long term".

Short-Term Topsoil Storage Areas

Short-term stockpiles of topsoil will be for areas to be reclaimed almost immediately upon cutting and at final grade. Topsoil will be redistributed promptly to minimize natural degradation processes.

Long-Term Topsoil Storage Areas

During any new construction of areas that will be used for the duration

of the mining operation within the permit area, topsoil will be collected and stockpiled. The topsoil will be used later for post-mining reclamation of the abandonment areas.

Topsoil Protection

The short-term topsoil stockpile will be sprayed with water or temporarily vegetated to retard erosion. The long-term topsoil stockpile will be protected by the following operational steps:

A stable surface will be provided in an area outside the influence of active operations.

As a stockpile is completed, it will be left in a rough condition to minimize erosion.

Stockpiles will be situated out of drainages to prevent water erosion.

Storage piles will be vegetated with quick-growing, soil-stabilizing plants. Revegetation will involve the immediate seeding of stockpiles topsoil during the next planting season with the seed mixture recommended in a report on vegetation and plant community analysis [see Attachment 2A Seed List] in compliance with the requirements of the appropriate land management agency.

Signs will be posted to protect the stockpiles from accidental use as fill or from other inadvertent material contamination.

The establishment of noxious plant species will be prevented.

The stockpiled topsoil will not be removed or otherwise disturbed until required for the redistribution operation on a prepared, regraded disturbed area.

PLANS FOR REDISTRIBUTION OF SOILS

Prior to topsoil redistribution, regraded land will be scarified by a ripper-equipped tractor. The ground surface will be ripped to a suitable depth in order to reduce surface compaction, provide a roughened surface assuring topsoil adherence, and promote root penetration. Steep slope areas which must remain after abandonment will receive special ripping to create ledges, crevices, pockets, and screes. This will allow better soil retention and vegetation establishment.

Within a suitable time period prior to seeding, topsoil will be distributed on areas to be reclaimed. During this time, the topsoil will be allowed to settle and attain equilibrium with its natural environment. This procedure will be followed for areas in which facilities such as roadbeds, mine pads, and building sites are to be abandoned.

Topsoil redistribution procedures will ensure an approximate uniform thickness consistent with the proposed reclamation plan. Topsoil will be redistributed at a time of the year suitable for establishment of permanent vegetation.

To minimize compaction of the topsoil following redistribution, travel on reclaimed areas will be limited. After topsoil has been applied, surface compaction will be reduced by using appropriate equipment running at a suitable depth. This operation will also help prepare a proper seed bed and protect the redistributed topsoil from wind and water erosion.

Co-op Mining will exercise care to guard against erosion during and after application of topsoil and will employ the necessary measures to ensure the stability of topsoil on graded slopes. The specific methods to be implemented will be defined in the attached Interim Plan. An example of the soil stabilization methodology that might be used includes the placement of crushed and heavier material at the toe of roadfill slopes, and the random placement of large rocks and boulders on the surface. This procedure will

enhance the microclimate as well as make the reclaimed area more aesthetically compatible with the undisturbed surroundings.

Phosphorus

Nitrogen

Soil pH and salinity

Soil texture

Chemical analysis for micronutrients will be conducted by testing soil extracts from the redistributed material. All necessary fertilization or neutralization, as determined by soil testing, will be done according to the final Reclamation Plan.

EFFECTS OF MINING OPERATIONS ON TOPSOILS, NUTRIENTS, AND SOIL AMENDMENTS

Since the Co-op Mine is an underground mine, the impact of mining on soils will be minor overall. The impacts of surface operations and mining facilities on soil resources consist of coverage of soil by landfills and refuse, disturbance of soils during construction activities, erosion created by removing vegetation, reduced forage growth due to nutrient degradation, reduced livestock capacity, and particulate emissions to the air.

The areas in which soil has been disturbed to date within the permit area, includes the loadout area, future offices, shops and substations, roads, portal areas, and the topsoil storage areas. Additional acreage may be disturbed in the future if Co-op elects to proceed with certain projects it is considering.

MITIGATION AND CONTROL PLANS: SOILS TESTING PLAN

Detailed Interim Reclamation Plans [Appendix 3-C] are attached and will be part of the Bear Canyon Mine Reclamation Plan in regard to stockpiling and long and short term plans and goals for final reclamation.

SOIL TEST REPORT

NO. 7405.0

AGRICULTURAL CONSULTANTS, INC.
 P.O. DRAWER 507 — 240 S. FIRST AVENUE
 BRIGHTON, COLORADO 80601
 303/653-2313

DATE RCVD 11-12-92
 REPORTED 11-23-92

REPORT TO: CO-OP MINING COMPANY ATTN: MR. OWEN
 BILL TO: SAME
 GROWER: SAME
 SAMPLE ID: SCALES BEAR

TEXTURE <small>1=light, silty 2=sand, sandy 3=loam, loamy 4=clay</small>	pH		CEC Meq /100g	SALT Mmhos /cm	Na Meq /100g	Lime %	OM %	Org N Lbs	AVAILABLE NUTRIENTS ppm (1)											
	H ₂ O	Buf							NO ₃	P(2)	K(2)	Ca	Mg	S(2)	B	Zn	Fe	Mn	Cu	
LO	8.3	7.0	11.1	1.0	0.2	8.6	1.3	45.5	8	3	99	3400	210	31	0.6	0.6	3.8	2.0	0.3	
CROP	YIELD GOAL	CROP RESIDUE T/A	MNR T/A	RECOMMENDATIONS POUNDS PER ACRE																
				N	P ₂ O ₅	K ₂ O	Elem Sulfur	Lime	Mg	SO ₄ -S	Boron	Zinc	Iron	Mn	Cu					
DL Native Grasses	Average	-	0	40	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1 ppm = parts per million or lbs element per million lbs soil. ppm x 2 = lbs/acre 6-7" depth. ppm x 3.5 = lbs/acre feet. 2. P x 2.3 = P₂O₅ K x 1.2 = K₂O S x 3
 Values reported but without specific remarks are considered to be within growth range of intended crop.

If poor moisture conditions reduce fertilization accordingly.

Supervised by _____

Dianna Lansing

ATTACHMENT #2-A

RECOMMENDED SEED MIX

BEAR CREEK MINE
CO-OP MINING COMPANY

SPECIES	RATE* PER ACRE	APPROXIMATE NO. SEEDS/FT ²
<u>GRASSES</u>		
<u>Agropyron dasystachyum</u>	3	12
Thickspike wheatgrass		
<u>A. spicatum</u>	8	22
Bluebunch wheatgrass		
<u>Elymus Salina</u>	1.5	15
Salina wildrye		
<u>Oryzopsis hymenoides</u>	3	12
Indian ricegrass		
<u>Poa secunda</u>	1	21
Sandberg bluegrass		
<u>FORBS</u>		
<u>Achillea millifolium</u>	.15	10
Western yarrow		
<u>Aster chilensis</u>	.15	9
Pacific aster		
<u>Hedysarum boreale</u>	9	7
Northern sweetvetch		
<u>Lupinus sericeus</u>	20	6
Silky sweetvetch		
<u>Penstemon Palmeri</u>		
Palmer penstemon		
or		
<u>P. Strictus</u>	.5	7
Rocky Mountain Penstemon		

Attachment #2-A

SHRUBS

<u>Amelanchier Utahensis</u>	4	4
Utah serviceberry		
<u>Artemisia tridentata ssp. vaseyana</u>	.15	9
Big sagebrush		
<u>Cercocarpus ledifolius</u>	6	7
Curleaf Mountain mahogany		
<u>Chrysothamnus nauseosus var. albicaulus</u>	.5	5
Whitestem rubber rabbitbrush		
<u>Sambucus cerulea</u>	.8	4
Blue elderberry		
For hydroseeding	59.75	159
1/2 application for drill seeded areas	30.00	

* Rate is pure live seed to be broadcast and lightly covered.

ATTACHMENT 3-A

SOIL LEGEND

<u>SOIL SYMBOL</u>	<u>SOIL MAPPING UNIT NAME</u>
D2E	Datino bouldery fine sandy loam, 5 to 20 percent slopes
D1G	Datino very stony fine sandy loam, 55 to 70 percent slopes

DESCRIPTION OF THE SOILS

D2E Datino bouldery fine sandy loam, 5 to 20 percent slopes

This Datino soil is very deep and well drained. It occurs on moderately steep alluvial fans and some sloping flood plains at elevations of 7,100 to 7,140 feet [2,165 to 2,177 meters]. This soil formed in alluvium and colluvium derived mainly from sandstone and shale. The average annual precipitation is 14 to 16 inches [36 to 41 centimeters]. Mean annual air temperature is 42 to 45 degrees F. [5 to 7 degrees C.], mean annual soil temperature is 44 to 47 degrees F. [6 to 8 degrees C.], and the average freeze-free season is about 80 to 110 days.

Slopes are 5 to 20 percent and mostly East facing. They are short and concave-convex.

Vegetation is dominantly pinyon, Utah juniper, salina wildrye, squirreltail, big sagebrush, Douglas-fir, and Rocky Mountain juniper.

Included in mapping are small areas of a similar soil except with 20 percent gravel and cobbles in the surface layer.

Attachment 3-A

In a typical profile the surface layer is brown, bouldery fine sandy loam and cobbly loam about 10 inches [25 centimeters] thick. The subsoil is light brown very stony loam about 28 inches [71 centimeters] thick. The substratum is light reddish brown cobbly fine sandy loam to a depth of 60 inches [1.5 meters] or more.

Permeability is moderate. Available water capacity is 6 inches [15 centimeters] to a depth of 60 inches [1.5 meters]. Organic matter content in the surface layer is 4 percent. Effective rooting depth is about 60 inches [1.5 meters]. Surface runoff is medium and erosion hazard is moderate under potential native vegetation and high if vegetation is removed and the soil is left bare. Erodibility is low. This soil is used for range, wild-life habitat and mining operations.

Taxonomic classification is loamy-skeletal, mixed Typic Haploboralls.

A typical pedon of Datino bouldery fine sandy loam, 5 to 20 percent was described on the cut about 200 feet East and 1,100 feet South of the NW corner of Section 25, T16S, R7E.

A11 - - 0 to 2 inches [0 to 5 centimeters] brown [10YR 5/3] bouldery fine sandy loam, dark brown [10YR 3/3] when moist; moderate fine granular structure; loose, very friable, slightly sticky, non-plastic; common very fine to medium, few coarse roots; 10 percent boulders, 10 percent stones, 5 percent cobbles, 10 percent gravel; slightly calcareous; moderately alkaline [8.0]; abrupt smooth boundary.

A12 - - 2 to 10 inches [5 to 25 centimeters]; brown [10YR 5/3] cobbly loam, dark brown [10YR 3/3] when moist; moderate medium granular structure; soft, friable, slightly sticky, slightly plastic; common very fine to medium, few coarse roots; 10 percent cobble and 10 percent gravel; moderately calcareous; moderately alkaline [ph 8.2]; clear smooth boundary.

Attachment 3-A

B2 - - 10 to 38 inches [25 to 96 centimeters]; light brown 7.5YR 6/4] very stony loam, brown [7.5YR 4/4] when moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; common very fine to medium roots; 1 percent boulders, 30 percent stone, 10 percent cobbles, 20 percent gravel; moderately calcareous; strongly alkaline [ph 8.5]; abrupt wavy boundary.

C1 - - 38 to 60 inches [96 to 152 centimeters] light reddish brown [5YR 6/4] cobbly fine sandy loam, reddish brown [5YR 4/4] when moist; massive; soft, very friable, slightly sticky, non-plastic; few very fine and fine roots; 10 percent cobbles, 5 percent gravel; strongly calcareous; strongly alkaline [ph 8.6].

D1G Datino - Rock Outcrop Complex, 55 to 70 percent slopes

This map unit is on very steep canyon sideslopes. Slopes are short and concave-convex. Elevation is 7,140 to 7,600 feet [2,177 to 2,318 meters]. The average annual precipitation is 14 to 16 inches [36 to 41 centimeters]. Mean annual air temperature is 42 to 44 degrees F. [6 to 7 degree C.] and the average frost-free season is 80 to 110 degrees.

This unit is 75 percent Datino very stony fine sandy loam, 55 to 70 percent slopes in single and concave areas and 15 percent rock outcrop on ridges.

Included in this unit is about 10 percent of a shallow soil that is about 6 to 15 inches in depth, associated with the rock outcrop.

The Datino soil is very deep and well drained. This soil formed in colluvium derived mainly from sandstone and shale. Slopes are 55 to 70 percent and East facing. They are short and concave-convex. Vegetation is dominantly pinyon, Utah juniper, Rocky Mountain juniper, salina wildrye, Douglas-fir, curlleaf mountain mahogany.

In a typical profile the surface layer is brown or yellowish brown, very stony fine sandy loam about 16 inches [41 centimeters] thick. The subsoil is very pale brown, very stony sandy clay loam about 20 inches [51 centimeters] thick. The substratum is very pale brown, very stony silty clay loam to a depth of more than 60 inches [152 centimeters].

Permeability is moderate to 36 inches [91 centimeters] and moderately slow below 36 inches. Available water capacity is 6.5 inches [16 centimeters] to a depth of 60 inches [1.5 meters]. Organic matter content in the surface layer is about 4 percent. Effective rooting depth is about 60 inches [1.5 meters]. Surface runoff is rapid and erosion hazard is high under potential native vegetation and very high if vegetation is removed and the soil is left bare. Erodibility is low. This soil is used for range, wild-life habitat, and mining operation.

Taxonomic classification is loamy-skeletal, mixed Typic Haploboralls.

A typical pedon of Datino very stony fine sandy loam, 55 to 70 percent slopes was described on the bank about 150 feet North of the old mine portal about 300 feet North and 300 feet East of the SW corner of Section 24, T16S, R7E.

A11 - - 0 to 3 inches [0 to 8 centimeters]; brown [10YR 5/3] very stony fine sandy loam, dark brown [10YR 3/3] when moist; moderate fine granular structure; soft, very friable, non-sticky, non-plastic; many very fine, few medium and coarse roots; moderately calcareous; moderately alkaline [ph 8.4]; abrupt smooth boundary.

A12 - - 3 to 16 inches [8 to 41 centimeters]; yellowish brown [10YR 5/4] stony fine sandy loam, dark brown [10YR 3/3] when moist; weak medium granular structure; soft, friable, non-sticky, non-plastic; many very fine and fine, few medium and coarse roots; 2 percent boulders, 10 percent stones, 10 percent cobbles, 10 percent gravel; moderately calcareous; moderately alkaline [ph 8.4]; clear smooth boundary.

Attachment 3-A

B2 - - 16 to 36 inches [41 to 91 centimeters] very pale brown [10YR 7/3] very stony sandy clay loam, pale brown [10YR 6/3] when moist; weak medium subangular blocky structure; slightly hard, firm, slightly sticky, plastic; common very fine and fine roots; many fine pores; 2 percent boulders, 15 percent stones, 15 percent cobbles, 10 percent gravel; moderately calcareous; strongly alkaline [ph 8.6]; abrupt wavy boundary.

C1 - - 36 to 60 inches [91 to 152 centimeters] very pale brown [10YR 8/4] stony silty clay loam, light yellowish brown [10YR 6/4] when moist; moderate medium and coarse subangular blocky structure; hard, firm, sticky plastic; few very fine and fine roots, common fine pores; 2 percent boulders, 10 percent stones, 10 percent cobbles, 5 percent gravel; strongly calcareous; strongly alkaline [ph 8.9.].

APPENDIX 3 - E

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



Reply to
Instrument Analysis Division
490 Orchard Street
Golden, CO 80401

November 23, 1981

Phone: 303-278-9521

Mr. Jack Blair
Commercial Testing & Engineering Co.
139 South Main Street
Helper, UT 84526

Co-op Mining Co.
Lab No. 57-7609

Re: IAD #97-H654-335-01

Analytical Report

One sample was received for analyses on October 28, 1981. This sample was given our identification IAD #97-H654-335-01.

A portion of the sample (≈ 100 g) was extracted at pH₅ for 24 hours according to the procedures of EPA/Test Methods for Evaluating Solid Wastes, SW-846, 1980, EP Toxicity. The sample required ≈ 170 mls of 0.5 N acetic acid to adjust the pH to 5. The extracted solution was brought to volume (2000 ml) and filtered with a 0.45 μ m membrane filter. A portion of the filtered extract solution was acidified with nitric acid prior to metals analyses.

The solution was analyzed for Lead, Silver, Barium, Cadmium, and Chromium by flame atomic absorption; for Arsenic and Selenium by hydride generation atomic absorption; and for Mercury by cold vapor flameless atomic absorption using a permanganate/persulfate digestion and the gold amalgamation analytical technique to concentrate the Mercury.

The results of these determinations are presented in Table No. 1 and are reported in milligrams per litre (mg/L) in the filtered extract solution. The EP Toxic maximum contaminant levels are also presented.



Charter Member

Table No. I
(mg/L)
EP Toxicity

<u>Parameter</u>	<u>Co-Op Mining 57-7609</u>	<u>Maximum Contaminant Levels</u>
Arsenic	<0.001	5.0
Selenium	<0.001	1.0
Mercury	0.0004	0.2
Silver	<0.005	5.0
Barium	1.1	100
Chromium	<0.01	5.0
Cadmium	<0.005	1.0
Lead	<0.05	5.0

If there are any questions concerning these results, please call.


Bruce A. Hale
Section Supervisor


M. L. Jacobs, Ph.D., Mngr.
Instrumental Analysis Div.

BAH/cl



UMC 817.103 Covering Coal and Acid and Toxic
Forming materials

The PH, acid-base potential, texture and electrical conductivity of these materials must be included in the data reported.

Co-op Reply

The Co-op has submitted a sample to CT&E testing for this data at the time this submittal was prepared. A copy of the report will be sent directly to the UDOEM upon receipt. In the interim, the Co-op will commit to removing any and all such material should it be on the site. Also, the Co-op does not feel this regulation is applicable, for the area in question is not to be utilized in a manner which will constitute the stockpiling or storage of coal and/or refuse.

