

MRP Update Register

Mine Name

File Number

Date Rec.	Page #s	Plate #s	Approval Date	Insert By	Content/Remarks
Dec 1, 87		3-4		DD	
Oct 6, 87	3-115, 3-116 48-1, 48-2 48-1A - 48-1B		10/16/87	DD	
Jun 27, 87		2-2		DD	
Jun 27, 87	Appendix			DD	Comments to stipulations.
Jun 27, 87	Appendix 3-1			DD	
March 2, 87		2-2		DD	
7/16/86	3-1, 3-1A, 3-7 3-7A, 3B, 3-8A 3-20, 3-20A	PLATE 3-3 7-4A 3-4A		3/31/87 RUS	HINDWATER SEAM REVISION
7/16/86	3-27, Appendix 3-E SA-5, CHART 7, 20, 21, 21A	Plate 7-8A		3/31/87 RUS	"
7/16/86	CHART P. 77A CHART 3 P. 3-11A APPEN 7J			3/31/87 RUS	"
2/17/87	CHART 7, P. T	APPEN. 7-D, Figs. 6A → 6E CHART 7, PLATE 3, 4-1		3/31/87 RUS	"
2/3/87	Plate 2-2	Plate 2-2	2-3-88	DD 2/3/88	Surface Facilities

UMC 817.97 Raptor Nests

At the time of the request, Co-Op was not aware that the raptor nests were in the immediate area. Co-Op will note the locations of the above mentioned nests and continue to survey these locations for future activity and will notify the Division and USFS as to our observations.

UMC 817.97 "Critical Elk Winter Range"

Due to the extreme nature of the terrain (vertical escarpment) it was felt that impacts to big game would be minimal regardless of the time of year; however, Co-Op has committed to delay construction until elk would be off of this area and will complete construction prior to their return in the fall.

UMC 817.111-.116 Revegetation

Co-Op will spot revegetate all areas which may be adversely impacted as a result of the portal construction.

Additional Technical Deficiencies P.G.L.

UMC 817.101

Co-Op is committed to clean all coal which may crumble and fall down the slope that can be retrieved by hand. This would preclude material that is excessively fine ($\frac{1}{4}$ "-) or material that falls into areas which are inaccessible due to high hazard conditions. Co-Op anticipates 90+% of all coal can be removed.

The reclamation of the portals will utilize a John Deer 450E Crawler with a 6 way hydrolic blade which is a D-2 class dozer. This type of machine is ideally suited due to the low nature of the machine (7'6") with canopy and approximately 52 flywheel horse power. Material of an incombustible nature will be extracted from the underground working (floor or roof) and be pushed into the adit and then sealed as outlined in the Bear Canyon MRP Portal Seals, which is in line with UMC 817.15.

Co-op Mining Co.
53 West Angelo
Salt Lake City, Utah

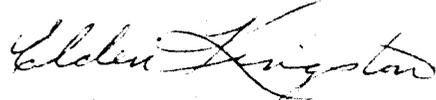
State Of Utah
Division of Oil, Gas, & Mining
Triad Center
Salt Lake City, Utah

Gentlemen:

Attached are Co-op Mining Co. answers and responses to the Division Of Oil, Gas, & Mining letter of July 25, 1985, re. "Draft Technical Analysis Response Deficiencies".

Should you have any questions please feel free to call on us.

Respectfully yours,



Co-op Mining Company

EK/jl

3 encl.

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**DIVISION OF OIL
GAS & MINING**

DRAFT TECHNICAL ANALYSIS RESPONSE DEFICIENCIES

Co-op Mining Company
Bear Canyon Mine
ACT/015/025, Emery County, Utah

UMC 782.13 Identification of Interest - JW

MRP - Chapter 2 page 2-3

UMC 782.14 Compliance Information - JW

MRP - Chapter 2 Appendix 2A

UMC 782.15 Right of Entry & Opemat.on Information - JW

MRP - Chapter 2 Appendix 2C (insurance), Appendix 2E (Easements)

UMC 783.25 Cross Section, Maps & Plans - JW

MRP - Chapter 3 page 2-10 & 2-11 has been changed to plate 3-4. Updated mine workings maps have been supplied.

UMC 805.11 Bond Estimate - PGL

- #1. MRP - Chapter 3 page 3-112 & 3-113
- #2. MRP - Chapter 3 page 3-107 & 3-108
- #4. MRP - Chapter 3 page 3-109 & 3-110
- #6. MRP - Chapter 3 page 3-117 & 3-118
- #7. MRP - Chapter 3 page 3-109
- #8. MRP - Chapter 3 page 3-117
- #10. MRP - Chapter 3 page 3-117
- #11. MRP - Chapter 3 page 3-115
- #12. MRP - Chapter 3 page 3-117
- #13. MRP - Chapter 3 page 3-118

NEW ITEMS

- #1. MRP - Chapter 3 page 3-112
- #2. MRP - Chapter 3 page 3-109 (corrected)
- #3. MRP - Chapter 3 page 3-116

UMC 817.21 -.25 Topsoil - EH

MRP - Chapter 3 pages 3-84, 3-93, 8-22, 8-23

UMC 817.44 Stream channel Diversions - TM

MRP - Chapter 7 by Lee Wimmer

UMC 817.45 Sediment Control Measures - TM

MRP - Chapter 7 & New maps added to MRP

UMC 817.46 Sediment Ponds - TM

MRP - Chapter 7 & New maps added to MRP

UMC 817.47 Discharge Structures - TM

MRP - Chapter 7

UMC 817.50 Underground Mine Entry & Access Discharges - RVS

MRP - Chapter 7

UMC 817.54 Water Rights Replacement - TM

MRP - Chapter 3 Appendix 3.3.6A

UMC 817.61 - .68 Use of Explosives - RVS

MRP - Chapter 3 page 3-5D

UMC 817.95 Air Resources Protection - PGL

MRP - Chapter 11 Appendix 11B

UMC 817.97 Protection of Fish, Wildlife & Environmental Values - SC

MRP - Chapter 3 page 3-65, Chapter 10 page 10-37

UMC 817.101 Backfilling & Grading - PGL

#3 (e). - MRP Chapter 3 Appendix 3F

#3 (f). - MRP Chapter 3 Appendix 3F

#4 MRP - Chapter 3 page 3-91A, 3-130

#5 MRP - Chapter 3 page 3-91B,

#6 corrected

#7 MRP - Chapter 3 page 3-91A, 3-95

#8 corrected

#9 MRP - Chapter 3 Appendix 3E

UMC 817.103 Backfilling & Grading - EH

MRP - Chapter 3 Appendix 3E

UMC 817.111 - .117 Revegetation - SL

Para. 1 - MRP Chapter 9 page 9-22 & 9-24

Para. 2 - MRP Chapter 3 page 3-99

Para. 3 - MRP Chapter 3 page 3-76 & Appendix 3C

Balance - MRP Chapter 3 page 3-101 thru 3-104

UMC 817.121 - .126 Subsidence Control - RVS

MRP Chapter 3 Appendix 3H

UMC 817.160 - .166 Roads: Class II - PGL

MRP Chapter 7 Cross Sections & Chapter 3 Appendix 3G

UMC 817.181 Support Facilities - PGL

Para. 1 thru 4 have been corrected

Para. 5 & para 6. - MRP Chapter 3 page 3-132 & page 3-137
and have been corrected.

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INTRODUCTION

AUG 26 1985

DIVISION OF OIL
& MINING

The purpose of this volume is to consolidate the material from the original version of the Co-op Mining Company Bear Canyon permanent regulation MRP that was submitted March 23, 1981 and subsequent and Technical Completeness Reviews made by the Division. Also to update and upgrade the information presented in the written material and maps, and to improve the format to better conform to the Division guidelines. Should the reviewer encounter any disparity in information presented herein as compared to previous submittals, this is to be considered the correct version.

The information contained herein is true and correct to the best of my knowledge.

Co-op Mining Company



J. A. Gustafson
Vice President

Before me personally appeared J. A. Gustafson, known to me to be the person who signed the foregoing document.

8-23-85
Date

Leona Stowell
Notary Public - State of Utah

My Comm. Expires
12-11-86

Table of Contents

CHAPTER 1	Introduction and Summary of Permit Application
CHAPTER 2	Ownership and Control
CHAPTER 3	Operation and Reclamation Plan
CHAPTER 4	Land Status, Land Use, and Post Mining Land Use
CHAPTER 5	Historical and Cultural Resources
CHAPTER 6	Geology
CHAPTER 7	Hydrology
CHAPTER 8	Soils
CHAPTER 9	Vegetation
CHAPTER 10	Wildlife Resources
CHAPTER 11	Climatology and Air Quality
	Letters of Approval

CHAPTER 1

INTRODUCTION AND SUMMARY OF PERMIT APPLICATION

TABLE OF CONTENTS

- 1.1 Scope of Operations
- 1.2 Summary of Environmental Impacts
- 1.3 Document Organization and Reviewer's Checklist

The following material constitutes a Mining and Reclamation Plan to obtain an underground coal mining permit for the Bear Canyon Mine operated by Co-op Mining Company.

This Amendment is submitted under the Utah Regulations of Coal Mining and Reclamation Operations Act (Title 40, Chapter 10, Utah Code Annotated 1953, as amended), the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87), the Cooperative Agreement between the State of Utah and the United States Department of the Interior, the Federal Land Policy and Management Act of 1976, regulations of the U.S. Geological Survey, the Permanent Regulatory Program regulations of the Surface Mining Reclamation and Enforcement, and the regulations for the State of Utah Department of Oil, Gas, and Mining.

1.1 SCOPE OF OPERATION

This section describes, in general terms, the scope of operations conducted by Co-op Mining Company at the Bear Canyon Mine. This general treatment orients the reader to the mine operation and provides an overall framework for understanding the specific details presented in the subsequent chapters of this application.

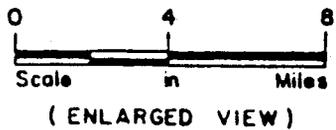
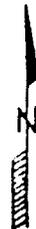
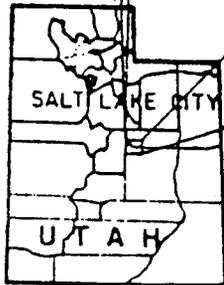
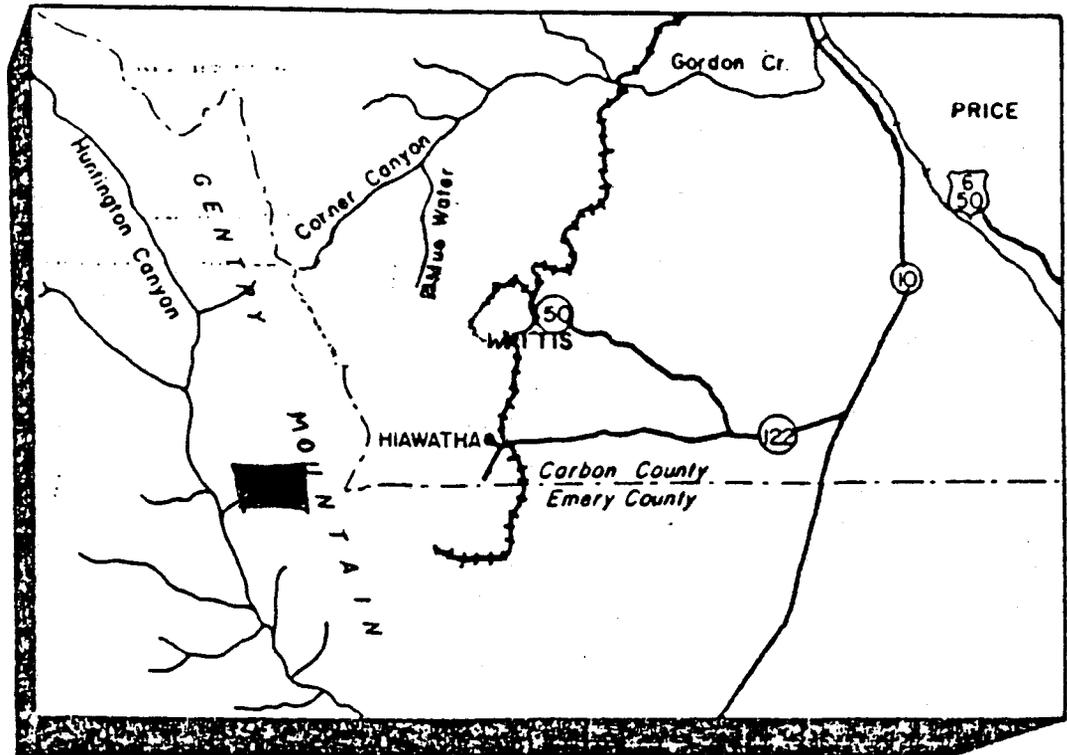


FIGURE 1-1
LOCATION MAP

CO-OP MINING COMPANY
EMERY COUNTY

Mining Plans

Co-op Mining Company controls 1,115 acres in Emery County Utah, (900 acres in Bear Canyon, 215 acres in Trail Canyon; see Figure 1-1). Mining has been conducted on this site from 1938 to the present time and 20 million tons of new, minable coal are estimated to remain in the Blackrock Bed within the permit application area. Production during the first five-year period will total 1 million to 1.5 million tons, with an average full capacity production of 200,000 ton/year reached by the fourth year. The exact figure will depend on market conditions, of course, (all figures are for raw tons).

Access to the reserves on the property is made through 3 portals. The middle seam portal (referred to as Portal 1) and the original Bear Canyon seam portal (Portal 2) are used primarily to recover coal from previously worked areas.

Since the mining in many areas involves working in the proximity of the old mine, main entry pillars will be columnized to provide vertical support and prevent "punching" by the pillars, which would produce unsafe working conditions and cause the loss of recoverable coal.

All portals will be sealed when workings cease. Surface breakouts from the seam for ventilation will be made in Bear Canyon and may be made in Trail Canyon. Mining conditions in the future may warrant additional ventilation.

The current mining system employs room and pillar mining with continuous miners. Pillars are removed wherever possible. In the virgin coal areas, development will allow use of either room and pillar or Long-wall methods or a combination of both, with room and pillar preferred wherever feasible.

As the mine develops, main entries will be driven in two sets of either four, five, or six, with barrier pillars separating each set. These main entries will run East to West, to the property boundary. Submain entries will run at right angles from the main entries to the limits of the property.

Overall, an advance-retreat mining system is projected for this mine with retreat mining employed prior to abandonment of each section.

Barrier Pillars

Barrier pillars will be left to protect entries within

the permit area. The subsidence wave caused by maximum coal recovery will cause only minor and easily reparable damage above the coal outcrops. Mining will be stopped a minimum of 200 feet from the surface to maintain stability of the surface in the places where coal outcrops occur. Barrier pillars will be left in place to protect the steep escarpments.

Conservation of Coal Reserves

Mining of this area provides for maximum recovery of the coal reserves, about 60 percent overall. This high recovery is due both to known mining conditions and Co-op Mining company's engineering and production practices. The main entry system will allow access to the reserves West of the permit area. Reserves to the North can be entered through outcrops.

Equipment

The equipment used to mine the permit area is listed in Section 3.4.5. Additional equipment will be acquired as needed.

Mine Safety

The Bear Canyon Mine will comply with all federal, state, and local regulations for safety, security, and fire control in matters pertaining to signs, fences, hazardous and flammable materials, explosives, fire protection, monitoring of coal and refuse piles, routine accident reports, corrective actions, good housekeeping, and mine maps and records.

Operations Schedule

Annual production is scheduled to increase from 200,000 tons in 1983 to 400,000 tons by 1986. The mine operates three shifts per day for 240 days per year and employs 30 to 40 salaried and hourly workers. If production rises to 400,000 ton/year, employment will increase by a maximum of 5.

Permit Area

The permit area comprises lands owned by COP Development company. At present, there is no land leased by the company from the state and federal governments.

1.2 SUMMARY OF ENVIRONMENTAL IMPACTS

Impacts on Current and Future Land Use

Hydrology - Soil disturbance during the life of the mine will increase erosion, but required sediment control measures will reduce impact on lowlands. There will be minimal discharge of ground water from the mine.

Vegetation, Range Management, and Soils - Temporary disturbances will remove vegetation and increase erosion, but revegetation will return desired vegetation, decrease erosion, and increase forage production.

Minerals - There is oil and gas potential in the area; however, there should be no conflict between coal mining and development of this resource.

Archaeology - No sites warranting preservation are located within the permit boundaries.

Timber, Fire, and Transportation - No merchantable timber exists within the permit area. Some

shrubs will be removed during operation, but it will be replaced by revegetation growth and yield. Access roads will provide for easier fire control and will allow removal of any fire hazards.

Recreation and Scenic Resources - In the short term the mine will reduce the recreational values of the permit area. Recontouring and grading of disturbed areas wherever possible will restore scenic values and revegetation will improve wildlife habitats.

Human Values

No public parks nor historical sites lie within the permit area. There are no historical, archeological or paleontological resources either.

Hydrologic Balance

The Bear Canyon Mine will have no impact on the quantity of ground water. Subsidence caused by the mine will have no effect on springs; the mine will intercept only miniscule quantities of water destined for the Huntington Creek drainage; the mine will not affect water supply for vegetation or creek flow.

Sediments and other impurities will be removed from surface water before discharge. Acid drainage will not occur because of the low sulfur content of the coal. Ground water discharged from the mine is not anticipated, due to the mines utilization of all water, once the mine is in full operation. Suspended sediments will increase in streams adjacent to construction areas, but this effect will be mitigated by required sediment control.

Soil Resources

Because the mine lies underground, the impact on soils is minimal overall. Surface operations and mining facilities will cover soil; disturbed soil in construction areas add to erosion because of removal of vegetation and reduced forage and livestock capacity. These impacts will be mitigated by the reclamation plan. Before disturbance on virgin areas the topsoil will be removed, stockpiled and stabilized temporarily. Disturbed surface areas will be backfilled, compacted and graded to return them to as near their original contour as possible. Topsoil will be redistributed and stabilized. Re-vegetation will control erosion and increase forage and wildlife capacity.

Vegetative Resources

Impacts on vegetative resources will not be major since the Bear Canyon Mine is underground. Vegetation will be removed from areas of construction, erosion will increase and plant species will be reduced. These impacts will be mitigated by revegetation of disturbed areas with a suitable, permanent and diverse vegetative cover.

Fish and Wildlife

Since the mine will impact such a small area, the future impact of continued mining operations is expected to be minimal.

Impact on large game species will be minimized by the location and timing of surface activities. Impact on small burrowing mammals in areas of subsidence will be locally great but only temporary. All species are of adequate density, and any losses will be made up by contiguous breeding populations.

Impact on nesting birds will be minimal and local. No endangered species nest in the area.

No impact on amphibians and reptiles is expected because of the species' widespread distribution.

Huntington Creek is the only quality stream in the area and it is unlikely to be affected by sediment or subsidence. Thus, no adverse impact on aquatic wildlife is expected.

Air Quality

The only potential air pollutant produced by the mine will be particulates.

Total annual controlled emissions should be less than the 250 ton/year, controlled emission PSD cutoff. Therefore the mine does not qualify as a "major source" under the Prevention of Significant Deterioration (PSD) requirements.

Dust from road use will be reduced by water or chemical treatment of roads, vehicle use restrictions, speed limits, soil stabilization and periodic grading where appropriate. Coal dust will be controlled by spray, compaction and non-toxic dust suppressing chemicals.

Subsidence

Maximum removal of the coal resource could result in surface subsidence over the long term.

No damage will occur to manmade structures due to the topography of the area and its inaccessibility-precluding the existence of any structures. No damage is expected to result to power lines that exist within the permit area. If damage should prove to be greater than expected, such facilities could be moved to more stable sites. Subsidence effects in the unmined eastern portion of the permit area will have to be anticipated on a site-specific basis; however, the 1,000 foot of overburden in the area should minimize surface impacts. Monitoring of ground and surface impacts. Monitoring of ground and surface water will be conducted and mitigating measures employed if any significant impact occurs.

Waste Disposal

There is no refuse disposal in the mine plan area. However, Mine generated garbage is contracted to be removed on an annual basis. Dumpsters are located in three locations and are emptied as needed.

1.3 INTRODUCTION TO DOCUMENT ORGANIZATION AND
REVIEWER'S CHECKLIST

This Mining and Reclamation Plan follows the "General Guideline for Organizational Format and Content- -Permit Applications" revised November 3, 1980 by the Division of Oil, Gas, and Mining of the State of Utah. This organization is pursuant to U.C.A. 40-10-10(2) and UMC 771.23(a.). The table of contents for the overall mine plan, located at the front of this first volume, lists the chapters and appendices. A detailed chapter outline precedes each chapter and lists the chapter headings, plates, figures, tables and appendixes and attachments.

Tables appear with the chapter text following the reference to them. Tables are double-numbered; thus, Table 2-1 is the first table in Chapter 2, Table 2-2 the second, and so forth. Figures, which are normalized (8-1/2 x 11 or 11 x 17) illustrations, are double-numbered (Figure 2-1, 2-2, etc.) and also appear on following pages. Plates are oversized illustrations. Numbered with the same system as tables and figures, they are folded and enclosed in sleeves at the end of the chapter in sequential order.

References within the text are made by author's last name and the date of publication. References are listed alphabetically by author in the bibliography at the end of the chapter.

CHAPTER 2

OWNERSHIP AND CONTROL

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 - 2.2.3 Purchase of Record Under a Real Estate Contract for Surface Area Coal
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 - 2.2.5 Resident Agent of the Applicant
 - 2.2.6 Business Designation
 - 2.2.7 Coal Mining Permits
 - 2.2.8 Owners of Record of Surface and Subsurface Areas Contiguous to the Proposed Permit Area
 - 2.2.9 Mine Name and M.S.H.A. Identification
 - 2.2.10 Applicants' Interest in Areas Contiguous to Proposed Permit Area
- 2.3 Compliance Information
- 2.4 Right of Entry and Operation Information
- 2.5 Relationship to areas designated unsuitable
- 2.6 Permit term information
- 2.7 Personal Injury and property damage information
- 2.8 Proposed Performance Bond
- 2.9 Other Licenses and Permits
- 2.10 Location of Public Office
- 2.11 Newspaper Advertisement
- Appendix 2-A Violation List
- Appendix 2-B Title Insurance Policy
- Appendix 2-C Indsurance
- Appendix 2-D Affidavit Of Publication
- Appendix 2-E Pole Line Easement

2.1 SCOPE

This chapter provides all relevant and required information about the ownership and control of persons operating the Bear Canyon Mine, ownership and control of lands in the permit area, compliance status and history of the mines and their owners and operators, insurance and performance bonds, applicable licences and status of permits and filings and public notices of this application. Also a portfolio of comments received to this date. (Appendix 2-1)

2.2 IDENTIFICATION OF INTEREST (UMC 782.13)

Permit Applicant: CO-OP MINING CO.
53 West Angelo Ave.
Salt Lake City, Utah 84115
Tele. 801-486-5047

2.2.1 OWNERS OF RECORD OF SURFACE AREA AND COAL RIGHTS

Land and Coal Owner: C O P Coal Development Co.
3140 South Main St.
Salt Lake City, Utah 84115

Plate 2-1 shows the property within and contiguous to the permit boundaries. The initials COP on this

plate stand for COP Development Company.

Authorization to mine is represented by the initials "ATM" Table 2-1 lists the fee owners of the surface and mineral property rights.

Table 2-1 Property Ownership

<u>PARCEL</u>	<u>SURFACE</u>	<u>COAL</u>	<u>MINERALS</u>	<u>GRAZING</u>	<u>OIL & GAS</u>
A	COP Devel.	"	"	"	"
B	Nevada Power	"	"	"	"
C	U.S. Forest S."	"	"	"	"

(See Table 2-2_

2.2.2 HOLDERS OF LEASEHOLD INTEREST IN SURFACE AREA AND COAL RIGHTS

The names and addresses of holders of record in Leasehold interest are listed below:

Coal mining lease by and between Co-op Mining Co. and Peabody Coal Co., executed Dec. 1st, 1975.

See Plate IV-1 Area T16S, R7E S LBM
Sec. 14 SW $\frac{1}{4}$ *Who*
" 23 E $\frac{1}{2}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$, SW $\frac{1}{4}$
" 24 all West of N-S Fault
" 25 All West of N-S Fault

The Right to mine and remove from, and use for purposes incident to mining, including access roads, camp facilities, surface operations, storage of coal, and other activities. Also unrestricted use of all access roads leading to and from property. Lease is binding on

the successors to the parties of the lease.

2.2.3 PURCHASE OF RECORD UNDER A REAL ESTATE
CONTRACT FOR SURFACE AREA COAL

See Appendix 2-B Title Insurance Policy

2.2.4 OPERATOR, IF DIFFERENT FROM APPLICANT

Same as above.

2.2.5 RESIDENT AGENT OF THE APPLICANT (UMC 782.13)

Nathon Atwood
P.O. Box 1245
Huntington, Utah 84528
(801) 748-5238

2.2.6 BUSINESS DESIGNATION (partnership)

Officers and Directors of the Applicant

Earl W. Stoddard
P.O. Box 300
Huntington, Utah 84528

John Gustafson
1815 South 1100 West
Woods Cross, Utah 84087

R.L. Brown
3140 South Main
Salt Lake City, Utah 84115

2.2.7 CURRENT, PENDING OR PREVIOUS COAL MINING
PERMITS IN THE U.S. HELD BY APPLICANT
AND PRINCIPAL SHAREHOLDER SUBSEQUENT TO 1970

Act/015/021 Oil, Gas, and Mining Div.

Act/015/025 Oil, Gas, and Mining Div.

2.2.8 OWNERS OF RECORD OF SURFACE AND SUBSURFACE
AREAS CONTIGUOUS TO THE PREPOSED PERMIT AREA

Plate 2-1 displays the parcels of land contiguous to the permit boundaries. The parcels are designated with lower case letters. The Names and addresses of the owners of record are listed below:

The same as the General Partners.

2.2.9 MINE NAME AND M.S.H.A. IDENTIFICATION

The name of the mining operation for which this application is submitted is:

Bear Canyon Mine-Co-op Mining Company

The M.S.H.A. Identification Number is:

MSHA #42-00081-0

2.2.10 APPLICANTS'S INTEREST IN AREAS CONTIGUOUS
TO PROPOSED PERMIT AREA

2.3 COMPLIANCE INFORMATION (UMC 782.14)

See Appendix 2-A

2.4 RIGHT OF ENTRY AND OPERATION INFORMATION
(UMC 782.15)

The applicant's right to enter the lands and

to conduct operations in the permit area is based on the documents listed in Section 2.4.1. It should be noted that the applicants' right is not subject to any pending litigation. Easements are included under Appendix 2-E

2/4/1 DOCUMENT DESCRIPTION

The following documents support Co-op Mining Company's right of Entry and Operation.
(see Appendix 2-B)

- A---Title or Title Insurance Policy
- B---Deed or Trust Deed
- C---Utah Business Licence
- D---County Business License
- E---Tax Commission License
- F---Coal Leases
- G---Etc.

2.4.2 IDENTIFICATION AND EXPLANATION OF
LEGAL RIGHTS OR AGREEMENTS FOR LANDS
TO BE AFFECTED BY MINING ACTIVITIES

Not Applicable

2.4.3 MAP SHOWING LEGAL BOUNDARIES

Legal boundaries of the permit area and contiguous areas are shown on Plates 2-1 and 2-2.

2.5 RELATIONSHIP TO AREAS DESIGNATED UNSUITABLE
TO MINING

2.5.1 INFORMATION ON AREA SUITABILITY FOR
SURFACE AND UNDERGROUND DISTURBANCE

No portion of the area to be permitted is within an area designated as unsuitable for mining under the provision of 30 CFR 764 and 765. To the best of the applicant's knowledge, no portion of the area to be permitted is under study of designation as unsuitable for mining in an administrative proceeding under 30 CFR 764 and 765.

In preparing this application, Co-op Mining Co. has conducted the most comprehensive study known to date of the suitability of the permit area. That study makes up the following chapter of this report.

State and federal regulations allow an area to be unsuitable for the mining of coal if:

- o Reclamation is not economically or technologically feasible.

Reclamation at the Bear Canyon Mine is

economically and technologically feasible. Reclamation plans are detailed in Section 3.6.

- o Coal mining is incompatible with state and local land use.

Coal mining is compatible with present and future land use of the permit area. Section 4.4 describes land use in detail.

- o Mining would affect fragile or historical lands and significantly damage historical, cultural, scientific, or esthetic values of natural systems.

The permit area is neither historically significant nor fragile. There are only ten archeological sites, primarily contiguous to the permit area, none warranting nomination to the National Register (see Section 5.5.1) Damage to natural systems will be minimal and will be mitigated (see Section 3.5). The area contains no endangered animal or plant species (see Section

3.5.5 and 3.5.6 and Chapters 9 and 10).

- o Mining would affect renewable-resource lands and result in substantial losses of food, fiber, or water supply.

The permit area contains no prime farmland (see Section 4.4.2.4) or merchantable timber (Section 4.4.2.1). The mine will have only minor impact, some of it beneficial, on water resources (see Sections 3.5.3, 7.15, and 7.2.5).

- o Mining would affect natural-hazard lands and thereby endanger life and property.

The permit lands are not natural-hazard lands.

In addition, the permit area includes no cemetery, no national trails, no wild and scenic rivers, no wilderness study areas, and no significant harvestable forest cover.

2.5.2 Waiver Under UMC 786.19(d)(2)

Not Applicable

2.5.3 Waiver of Owners of Nearby Occupied Dwellings

Applicant does not propose to conduct or locate surface facilities within 300 feet of an occupied dwelling.

2.6 PERMIT TERM INFORMATION - ANTICIPATED FOR EACH PHASE

2.6.1 Starting Date

Starting dates anticipated for each phase of mining are dependent on permit approvals, however, it is hoped that work could commence by early spring 1981 and the mine could theoretically be in production by mid summer that same year.

2.6.2 Termination Dates

Termination dates anticipated for each phase of mining are nebulous at this time although a detailed estimate of production and reserves are included in the Geology Section and a projection of 50-years appears realistic.

The final termination date for the mining operation is expected to be 2030.

2.6.3 Numbers of Surface Acres Affected

The anticipated disturbance by the Bear Canyon Mine totals about 10 acres. Plate 2-2 shows potential property expansion and future facilities of the mine.

2.6.4 Horizontal Extent of Underground Working for Each Phase

Section 3.4.8.3 tabulates the horizontal extent of underground working.

2.6.5 Vertical Extent for Each Phase

Plate 3+4 shows the mine development plan by seam during each of the next five years, then for each five-year period thereafter for the life of the mine.

Between 1983 and 1988, all production will be from the Middle Seam (see Section 3.4.1, Mining Plans).

In 1983 ----1988 recovery of the Middle Seam will occur on the Co-op fee land (see Plate 3-4)

2.6.6 Mining in Excess of Five Years

The amount of reserves within the permit area is not minable in five years. The Co-op Coal Company anticipates continuing operations at the Bear Canyon Mine at least through the remainder of the twentieth century. Investments have accordingly been made and will continue to be made in facilities, equipment, property, and mineral and mining leases. Investment in much of the equipment and facilities will not have been recovered within five years. Furthermore, associated reclamation costs for disturbed areas will be substantial. For these reasons a permit term of 20 years is requested.

The information included in this application deals with the effects of the entire 20-year period of proposed mining (see Plate 3-4) New and updated information will be supplied as required.

2.7 PERSONAL INJURY AND PROPERTY DAMAGE INFORMATION

Co-op Coal Company carries public liability and

property damage insurance in due force. In response to OSM's completeness statement, this policy has been increased to comply with the requirements of 30 CFR 806.14 and UMC 806.14. The policy bears a rider requiring the insurer to notify OSM and DOGM if the policy is cancelled. A copy of the certificate of insurance and rider is supplied to the Utah Division of Oil, Gas, and Mining. (see Appendix 2-C)

2.8 PROPOSED PERFORMANCE BOND

As required by UMC 800.11 and 30 CFR 800.11, the applicant has filed copies of a Performance Bond conforming to 30 CFR 805 and 806 and UMC 805 and 806. Reclamation costs relevant to this bond are detailed in Section 3.6.7.

2.9 OTHER LICENSES AND PERMITS

Section 2.2.8 lists coal mining permits applied for by the applicant and principal shareholder. The other permits and licenses dealing with land use, air and water quality, water rights and health and safety laws and regulations are listed in Table 2-4.

2.10 LOCATION OF PUBLIC OFFICE FOR FILING APPLICATION

The applicant has simultaneously filed complete copies of this application with the following agencies:

State of Utah 7 copies
Division of Oil, Gas, and Mining
655 W. N. T., 3 Triad Center Suite 350
Salt Lake City, UT 841

Emery County Clerk 1 copy
Emery County Courthouse
Castle Dale, UT 84513

2.11 NEWSPAPER ADVERTISEMENT/PROOF OF PUBLICATION

On the date of the filing of this application with Division of Oil, Gas, and Mining, the applicant has filed an advertisement with the Emery County Progress and Sun Advocate, local newspapers with circulation in Emery & Carbon counties sufficient to cover the locality of the applicant's operations. This advertisement follows the format required under 30 CFR 786.11 9a0 and UMC 786.11 (a). A copy of the publication is attached in Appendix 2D. Proof of publication has been submitted with the copy in Appendix 2D.

Table
 APPARENT COMPLETENESS REVIEW
 ATTACHMENT
 OTHER PERMITS AND LICENSES
 BEAR CREEK CANYON MINE

Agency	Permit/License	Reference	Identification #	Date of Application	Date of Approval
Utah Division of Oil, Gas and Mining	Surface Mining Control and Reclamation Permit	Interim Permit	ACT/015/021	May 16, 1978	March 7, 1979
U. S. Environmental Protection Agency	National Pollution Discharge Elimination System (NPDES)	Federal Water Pollution Control Act	UT-0023612	Apr 15, 1979	July 8, 1979
	Spill Prevention Control & Counter Measure Plan	Federal Water Pollution Control Act		Pending	
	Prevention of Significant Deterioration Permit (PSD)	Clean Air Act Amendments of 1977			Potential emissions less than 100 tons per year. PSD not required.
Utah Division of Water Rights	Approval Order Small Structures	Section 73-5-5 of Utah Water Code		none	
Dam Safety	Dam Design Review	Section 73-5-5 of Utah Water Code		none	
Utah Division of Environmental Health	Approval Order Air Quality	Utah Air Conservation Act		May 5, 1980	June 17, 1980
	Approval Order-Culinary Water Wastewater & Solid Waste Disposal Site Facilities	Utah State Water Pollution Control Act		Pending	Solid waste not required. See exhibit 'a'.
	Construction Permit for Sedimentation Ponds				Construction is complete at present.
	Driveway Permit for Each Location Where a Private Road Enters a County or State Road				Have valid existing rights. (UMC 761.5 (b))

Agency	Permit/License	Reference	Identification #	Date of Application	Date of Approval
Utah Division of Water Rights	Water Rights Appropriation of Record of Diversion			none	
Mine Safety & Health Administration	Mine Permit	Mine Safety & Health Act	42-00081-0 42-0697	Dec 10, 1978 Sept 24, 1980	Dec 22, 1978 Sept 27, 1980
Industrial Commission of Utah	Notice of Intent to Mine Coal	General Safety Orders Utah Coal Mines			
Bureau of Land Management	Right-of-Ways/ Special Use Permits	Federal Land Policy & Management Act of 1976			Permit area on Fee land.
Utah Division of State Lands	Right-of-Ways/ Special Use Permits				Permit area on Fee land.
U. S. Forest Service, etc.	Right-of-Ways/ Special Use Permits				Permit area on Fee land.
County Zoning Commission		Zoning approval		Jan 30, 1980	Apr 7, 1980

The iterim permit for the Trail Canyon mine was terminated in November of 1983.

The itemim permit for the Bear Canyon mine was temporary suspended in August 1984.

The suspension was lifted and the mine reopened October 4, 1984.

8/23/85

Appendix 2-1

No comments have been received as of this date.

Appendix 2-A

VIOLATION LIST NUMBER (1)

<u>Violation Number</u>	<u>Violation</u>	<u>Reg. No.</u>	<u>Location</u>	<u>Status</u>
N79-5-5-27-2 <u>9/18/79</u> 1 of 2	Failure to dispose of waste within an area not approved by the Regulatory Authority	30 CFR 715.15 of the rules and regulations PL 95-87 Sec. 516	Head of hollow behind Mr. Owens trailer adjacent to supply road to the portal.	Abated, Assessments made and paid
N79-5-5-27 <u>9/18/79</u> 2 of 2	Failure to have a copy of all current permits licenses, approved plans, or other authorizations to operate the mine shall be available for inspection at or near the mine-site.	30 CFR 717 11b of the rules and regulations PL 95-87, Sec. 517 (b) (1).	Entire operation	
<u>11/27/79</u>	Cessation Order			
<u>5/6/80</u>	Failure to maintain diversion so as to permit additional contribution of suspended solids to overland flow.	MC 717.17 (c)		
N80-1-14-4 1 of 4	Operating without a permit	40-10-9-(1) Utah code Annotated 1953	Recent development of truck turnaround area above scalehouse.	Abated, Assessments made and paid
N80-1-15-2 2 of 2	Failure to mine in accordance with approved plan. Failure to monitor surface water as required by the Regulatory Authority.	MC 715-11 (a) MC 717-11 (a) MC 717(b)(1) (v)	Surface water monitoring plan	

VIOLATION LIST NUMBER (1)

<u>Violation Number</u>	<u>Violation</u>	<u>Reg. No.</u>	<u>Location</u>	<u>Status</u>
2 of 4	Failure to pass surface drainage from a disturbed area through a sediment control structure.	MC 717.17 (a) Title 40-10-17 (i) (ii) (a)	Reclaimed area between haul road and Huntington Canyon Highway.	
3 of 4	Failure to maintain ditches, culverts, and other structures serving to drain access and haul road.	MC 717.17 (i) (3) (ii) Title 40-10-17 (a)	1. Culverts of upper access road to portal area. 2. Upper culvert of mainstream drainage. 3. Diversion ditch between lower shop area and stockpile. 4. Diversion ditch between coal stockpile & sed. pond.	
4 of 4	Failure to segregate stockpile and protect topsoil from wind and water erosion or contaminants.	MC 717.20 (a) Title 40-10-17 (e)	Refuse extension area above sediment pond diversion channel.	
N80-1-15- 2 1 of 2 12/4/80	Failure to mine in accordance with approved plan. Failure to monitor ground water as required by the Regulatory Authority.	MC 715.11 (a) MC 717.11 (a) MC 717.17 (h) (2)	Groundwater monitoring plan.	Abated, Assessments made and paid

VIOLATION LIST NUMBER (1)

<u>Violation Number</u>	<u>Violation</u>	<u>Reg. No.</u>	<u>Location</u>	<u>Status</u>
N78-V- 1-1-1-A <u>11/9/78</u>	Opening & developing a site for surface coal mining operations without a State permit. Violation 30-USC-502(a)	USC 502 (a)	Entire Operation	Abated, Assessments made and paid
1-B	All surface drainage from disturbed areas is not passing through a sedimentation pond. No surface runoff collection system on sedimentation ponds exists at this site.	717.17	All portions of surface disturbance at the minesite.	
1-C	Failure to post mine permit identification signs.	30 CFR 712.12	All public access points to the minesite, namely public access to minesite from St. Highway 31.	
1-D	Failure to monitor ground water.	30 CFR 717.17	Entire Operation	
1-E	Failure to develop and implement a surface water monitoring program.	30 CFR 717.17	Entire Operation	
1-F	Failure to treat or bury and compact combustible material	PL 95.87 Sec 515 (b) 914 + 30 CFR 717.14	1. Waste Pile area under conveyor belt that leads to the coal stockpile area from the tippie site. 2. Area that borders the coal stockpile site about 100 ft. downstream from the stream crossing that enters the stockpile area over Trail Creek.	Abated, Assessments made and paid

NOV/CO STATUS REPORT

MINE: ACT/015/021

<u>NOV/CO #</u>	<u>Date Issued</u>	<u>Abat. Dead</u>	<u>Term/Vac Date</u>	<u>Pertinent Regulations</u>
N81 3 05 01 01 of 01	03/04/81	04/03/81	T03/26/81	UMC817.11
C81 3 01 01 01 of 01	03/04/81	03/04/81	V05/12/81	UMC817.165 UCA 40-10-17 Vacated by ass conf off
N81 2 08 02 01 of 02	07/31/81	08/30/81	T12/09/81	UMC817.45 UMC817.165 UCA 40-10-18(2)(1)(11)
N81 2 08 02 02 of 02	07/31/81	08/30/81	T12/09/81	Umc817.89
N81 3 16 01 01 of 01	08/17/81	09/16/81	T11/27/81	UMC771.19
N81 2 13 04 01 of 04	10/15/81	10/15/81	T12/09/81	UMC771.19 UMC817.41 UMC817.46
N81 2 13 04 02 of 04	10/15/81	11/14/81	T12/21/81	UMC817.42 UMC817.45 UMC817.48 UMC817.71 UCA 40-10-18(2)(D)
N81 2 13 04 03 of 04	10/15/81	11/15/81	T12/21/81	UMC817.71 UCA 40-10-9(1)

<u>NOV/CO #</u>	<u>Date Issued</u>	<u>Abat. Dead</u>	<u>Term/Vac Date</u>	<u>Pertinent Regulations</u>
N81 2 13 04 04 of 04	10/15/81	11/14/81	T12/08/81	UMC817.45 UMC817.46 UCA 40-10-18(2)(1)(11)
N82 1 03 04 01 of 04	02/19/82	03/21/82	T04/06/82	UMC817.42
N82 1 03 04 02 of 04	02/19/82	03/21/82	T08/19/82	UMC817.45 SEE FTA/CO #82/1/2/1
N82 1 03 04 03 of 04	02/19/82	03/21/82	T08/19/82	UMC817.89
N82 1 03 04 04 of 04	02/19/82	03/21/82	T04/06/82	UCA 40-10-18(2)(H) Term date from AC/CONF
N82 1 02 01	03/23/82	00/00/00	T04/08/82	UMC817.45
N82 1 10 01 01 of 01	08/19/82	09/19/82	T04/08/82	UMC817.89 See CO/FTA #82/1/2/1 Term Date 4/8/82
C82 1 03 01 01 of 01	10/06/82	00/00/00	T10/08/82	UMC817.89 UCA 40-10-18(2)(1)(11)C
N83 5 03 01 01 of 01	02/15/83	03/07/83	T03/10/83	UMC817.41 UMC817.42 UMC817.43 UCA 40-10-18(2)(1)(11)

<u>NOV/CO #</u>	<u>Date Issued</u>	<u>Abat. Dead</u>	<u>Term/Vac Date</u>	<u>Pertinent Regulations</u>
N83 5 06 01 01 of 01	03/10/83	04/10/83	T03/11/83	UMC817.41 UMC817.42 UMC817.43 UCA 40-10-18(2)(1)(11)
N83 5 09 01 01 of 01	05/17/83	06/16/83	T10/27/83	UMC771.19 UMC 817.111 See CO/FTA for NOV #83/1/3/1 Board Vacated
C83 1 03 01 01 of 01	08/25/83	00/00/00	V10/27/83	UMC771.19 UMC817.111 Vacated by Board Order 10 27 83
N83 1 03 01 01 of 01	09/22/83	10/19/83	T03/28/83	UMC817.99 UMC817.100 40-10-17(U) R. Daniels to Mod & Term 2/24/84
N84 7 01 01 01 of 01	01 25/84	01/26/84	T01/26/84	UMC817.42 UMC817.45 UCA 40-10-18(2)(1)(11)
N84 4 15 01 01 of 01	11/02/84	11/22/84	T11/23/84	UMC817.46
N84 4 16 01 01 of 01	11/15/84	11/15/84	T11/15/84	UMC817.45
N85 4 14 01 01 of 01	04/23/85	05/08/85	00/00/00	UMC817.46

NOV/CO STATUS REPORT

MINE: ACT/015/025

<u>NOV/CO #</u>	<u>Date Issued</u>	<u>Abat. Dead</u>	<u>Term/Vac Date</u>	<u>Pertinent Regulations</u>
N81 2 07 02 01 of 02	07/31/81	08/30/81	V11/03/81	UMC817.45 UCA 40-10-18(2)(1)(11)
N81 2 07 02 02 of 02	07/31/81	07/31/81	T11/03/81	UMC817.68 Term result of A.C. upholding fact of NOV
N81 3 17 01 01 of 01	08/17/81	09/16/81	T11/27/81	UMC771.19
N82 1 05 01 01 of 01	06/10/82	07/10/82	T12/15/82	UMC771.19 UMC817.43 UMC817.45 UMC817.100 UMC817.170 UMC817.176
N82 5 02 10 01 of 10	12/16/82	01/16/83	T03/10/83	UMC771.19 UMC817.89 UCA 40-10-9, 40-10-20, 40-10-22
N82 5 02 10 02 of 10	12/16/82	01/16/83	T02/03/83	UMC771.19 UCA 40-10-9 See FTA/CO #83/5/1/4#1
N82 5 02 10 03 of 10	12/16/82	01/16/83	T12/22/82	UMC817.11 UCA 40-10-19(4)
N82 5 02 10 04 of 10	12/16/82	01/16/83	T02/02/83	UMC817.21 UMC817.22 UMC817.23 UCA 40-10-17(E) See FTA/CO #83/5/1/4 #2
N82 5 02 10 05 of 10	12/16/82	01/16/83	T01/10/83	UMC817.23 UCA 40-10-17(E)

NOV/CO

STATUS REPORT

MINE: ACT/015/025 (CONT.)

<u>NOV/CO #</u>	<u>Date Issued</u>	<u>Abat. Dead</u>	<u>Term/Vac Date</u>	<u>Pertinent Regulations</u>
N82 5 02 10 06 of 10	12/16/82	01/16/83	T12/17/82	UMC817.41 UMC817.44 UMC817.45 UCA 40-10-18(2)(1)(11)
N82 5 02 10 07 of 10	12/16/82	01/16/82	T02/03/83	UMC 817.45 See FTA/CO #83/5/1/4 #3
N82 5 02 10 08 of 10	12/16/82	01/16/83	T02/03/83	UMC817.41 UMC817.42 UCA 40-10-18 (2)(1)(11) See CO/FTA #83/5/1/4#4
N82 5 02 10 09 of 10	12/16/82	01/16/83	T03/10/83	UMC817.41 UMC817.42 UMC817.43 UCA 40-10-18(2)(1)(11)
N82 5 02 10 10 of 10	12/16/82	01/16/83	T03/10/83	UMC817.41 UMC817.42 UMC817.43 UMC817.45 UCA 40-10-18(2)(1)(11)
C83 5 01 04 01 of 04	02/02/83	00/00/00	T02/03/83	UCA 40-10-9(1)
C83 5 01 04 02 of 04	02/02/83	00/00/00	T02/03 83	UMC817.21 UMC817.22 UMC817.23 UCA 40-10-17(E) Signed under protest
C83 5 01 04 03 of 04	02/02/83	00/00/00	T02/07/83	UMC817.45
C83 5 01 04 04 of 04	01/01/83	00/00/00	T02/03/83	UMC817.41 UMC817.42 UCA 40-10-18(2)(1)(11)

<u>NOV/CO #</u>	<u>Date Issued</u>	<u>Abat. Dead</u>	<u>Term/Vac Date</u>	<u>Pertinent Regulations</u>
N83 5 02 02 01 of 02	02/04/83	03/07/83	T12/06/83	UMC771.19 UMC771.11 189 days admin delay
N83 5 02 02 02 of 02	02/04/83	03/07/83	T08/29/83	UMC817.43 UMC817.45 116 days admin delay See FTA/CO#83-1-2-1
N83 5 05 03 01 of 03	03/10/83	04/09/83	T08/17/83	UMC817.23 UCA 40-10-17(E)
N83 5 05 03 02 of 03	03/10/83	04/09/83	T12/06/83	UMC817.41 UMC817.45 UMC817.46 UCA 40-10-18(2)(1)(11)
N83 5 05 03 03 of 03	03/10/83	04/09/83	T08/17/83	UMC817.41 UMC817.45 UCA 40-10-18(2)(1)(11)
N83 5 07 01 01 of 01	05/02/83	05/02/83	T10/13/83	UMC771.19 UCA 40-10-9 & 40-10-22 74 days adm delay
N83 5 08 03 01 of 03	05/16/83	07/15/83	T12/06/83	UMC771.19 UMC771.13 113 days admin delay
N83 5 08 03 02 of 03	05/16/83	07/15/83	T03/28/84	UMC817.46 UMC817.47 RWD to term 2/24/84 189 days admin delay
N83 5 08 03 03 of 03	05/16/83	07/15/83	T12/06/83	UMC817.43 UMC817.45 UCA 40-10-18(2)(1) 133 days ad delay

<u>NOV/CO #</u>	<u>Date Issued</u>	<u>Abat. Dead</u>	<u>Term/Vac Date</u>	<u>Pertinent Regulations</u>
C83 5 03 01 01 of 01	05/20/83	00/00/00	T05/21/83	UMC771.19 UCA 40-10-9
N83 1 02 03 01 of 03	07/08/83	07/08/83	V08/25/83	UCA 40-10-22(1)(B) & 40-10-1(2) See BD HG
N83 1 02 03 02 of 03	07/08/83	08/08/83	V08/25/83	UMC771.19 UCA 40-10-9 board vac. alleged litigation
N83 1 02 03 03 of 03	07/08/83	08/08/83	V08/25/83	UMC771.19 UMC817.150 UMC817.155 UMC771.13 Board Vac. alleged litig.
C83 1 02 01 01 of 01	08/23/83	00/00/00	V04/05/84	UMC817.43 UMC817.45 UCA 40-10-18(2)(1)(11) not term or assed
N84 7 03 01 01 of 01	04/11/84	04/18/84	T04/25/84	UMC817.42 UMC817.43 UMC817.45
N84 4 13 03 01 of 03	10/24/84	11/15/84	T11/15/84	UMC817.42 UMC817.45 UCA 40-10-18(2)(1)(11)
N84 4 13 03 02 of 03	10/24/84	11/15/84	T11/15/84	UMC817.43 UMC817.45 UCA 40-10-18(2)(1)(11)
N84 4 13 03 03 of 03	10/24/84	10/24/84	T10/24/84	UMC817.46

<u>NOV/CO #</u>	<u>DATE ISSUED</u>	<u>ABAT. DEAD</u>	<u>TERM/VAC DATE</u>	<u>PERTINENT REGULATIONS</u>
N85 4 02 01 01 of 01	01/15/85	01/16/85	T01/11/85	UMC817.42 UMC817.45 UCA 40-10-18(1)(11)
N85 4 03 02 01 of 02	02/25/85	04/04/85	T04/19/85	UMC771.19 UCA 40-10-9
N85 4 03 02 02 of 02	02/25/85	04/04/85	V07/30/85	UMC771.19 UCA 40-10-22(1)(C)
N85 4 08 02 01 of 02	03/12/85	04/20/85	T04/01/85	UMC771.19 UCA 40-10-9
N85 4 08 02 02 of 02	03/12/85	03/21/85	T03/22/85	UMC817.45
N85 4 13 01 01 of 01	04/23/85	06/08/85	00/00/00	UMC771.19 UCA 40-10-22 (1)(C)
C85 4 04 01 01 of 01	05/02/85	05/02/85	T05/03/85	UMC843.11 (B)(1) & UCA 40-10-22 (1)(C)
N85 4 18 01 01 of 01	05/31/85	05/31/85	T05/31/85	UMC771.19 UCA 40-10-9

Appendix 2-B

Total Paid (50%) ...
of (A) Owner ...
...
(American Title ...)
(Standard Title ...)

OWNER'S
POLICY

POLICY OF TITLE INSURANCE

MADE THROUGH THE OFFICE OF

SOUTHERN EASTERN UTAH TITLE COMPANY



1115 S. STATE BUILDING • PRICE, UTAH 84501
(801) 637-1245

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS CONTAINED IN SCHEDULE B AND THE PROVISIONS OF THE CONDITIONS AND STIPULATIONS HEREOF, FIRST AMERICAN TITLE INSURANCE COMPANY, a California corporation, herein called the Company, insures, as of Date of Policy shown in Schedule A, against loss or damage, not exceeding the amount of insurance stated in Schedule A, and costs, attorneys' fees and expenses which the Company may become obligated to pay hereunder, sustained or incurred by the insured by reason of

1. title to the estate or interest described in Schedule A being vested otherwise than as stated therein,
2. any defect in or lien or encumbrance on such title,
3. lack of a right of access to and from the land, or
4. unmarketability of such title.

IN WITNESS WHEREOF, First American Title Insurance Company has caused this policy to be signed and sealed by its duly authorized officers, as of Date of Policy shown in Schedule A

First American Title Insurance Company



BY *[Signature]*
PRESIDENT

ATTEST *[Signature]*
SECRETARY

COUNTERSIGNED

[Signature]
ASSISTANT SECRETARY

SCHEDULE A

Total Fee for Title Search, Examination
and Title Insurance [REDACTED]
Order No. 8598-E

Amount of Insurance: [REDACTED]

Policy No. 11, 530-11

Date of Policy: September 25, 1970 at 3:10 p.m.

1. Name of Insured:
C.O.P. COAL DEVELOPMENT COMPANY,
a Utah corporation.

2. The estate or interest referred to herein is at Date of Policy vested in:

C.O.P. COAL DEVELOPMENT COMPANY,
a Utah corporation.

3. The estate or interest in the land described in Schedule C and which is covered by this policy is:

FEE SIMPLE

SCHEDULE C

The land referred to in this policy is situated in the County of Emery, State of Utah, and is described as follows:

T16S, R7E, 3LBM

Section 26: E $\frac{1}{2}$ NW $\frac{1}{4}$ and all that part of SE $\frac{1}{4}$ NE $\frac{1}{4}$ and the SE $\frac{1}{4}$ lying West of a Northeast-Southwest fault line.

EXCEPTING THEREFROM all coal.

14: S $\frac{1}{2}$

22: E $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$

23: All

24: NW $\frac{1}{4}$ NW $\frac{1}{4}$ and all that part of the SW $\frac{1}{4}$ NW $\frac{1}{4}$ and the W $\frac{1}{2}$ SW $\frac{1}{4}$ lying West of a Northeast-Southwest fault line.

25: All that part of the NW $\frac{1}{4}$ NW $\frac{1}{4}$ lying West of a Northeast-Southwest fault line.

26: W $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ PW $\frac{1}{4}$, and all that part of the NE $\frac{1}{4}$ NE $\frac{1}{4}$ lying West of a Northeast-Southwest fault line.

* * *

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

PAM - I DON'T KNOW WHERE THIS GOES I HOPE YOU CAN HELP HANDLE IMMEDIATE

requires extensive use of said road, and said extensive use, said road should be relocated for the welfare of the citizens of County as well as others who may use said road,

BE, be it agreed as follows:

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.

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

Donna 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. Woodard*
a General Partner

PERMIT

10844

District No. 4 Date October 1, 1982 Application of Co-op Mining Company
By Renda Owen, Title Manager

Address P.O. Box 1245, Huntington, Utah, Phone 740-5238, in Emery County
is hereby granted, subject to the Regulations for the Control and Protection of State Highway Rights-
of-Way, Standard Specifications for Road and Bridge Construction, Specifications for Excavation on
State Highways, General Safety Orders of the Industrial Commission, Safety Manual for Road and
Bridge Construction, Instructions to Flagmen, the approved plans, and any special limitations set
forth herein, permission for the purpose of excavate to construct an approach 30' wide for a
coal haul road.

within right-of-way limits of Highway No. 31, State Maintenance Section No. 08-31-01,
Milepost No. 32, in the following location:
about 12 miles northwest of the jct. of SR-10 & SK-31 on the east side
of the highway.

Receipt of \$5.00 permit fee is hereby acknowledged (delete where not applicable). The work permit-
ted herewith shall commence October 2, 1982 and shall diligently be prosecuted to completion. The
work shall be completed and all disturbed surfaces or objects restored on or before October 30,
1982. In the event work is commenced under this permit, the applicant agrees to prosecute the same
to completion by the date herein above specified. In the event the applicant fails or refuses to complete
the work the Utah Department of Transportation may, at its election, fill in or otherwise correct any
existing impediments at the expense of and subject to immediate payment by the applicant.

Applicant shall execute a bond in the minimum amount of \$1000, increased by multiples thereof as
determined by the District Director, to insure faithful performance of the permittee's obligation.
The bond shall remain in force for three years after completion of the work.

Before work permitted herewith is commenced, the applicant shall notify: John Cox at Huntington
687-9969 and commencement of said work is understood to indicate that the applicant
will comply with all instructions and regulations of the Utah Department of Transportation with respect
to performance of said work, and that he will properly safeguard said work to prevent accident and
shall indemnify and hold harmless the Utah Department of Transportation from all damages arising
out of any and all operations performed under this Permit.

Permittee shall not perform any work on State highway right-of-way beyond those areas or operations
stipulated on the permit.

If applicant fails to comply with Utah Department of Transportation regulations, specifications, or
instructions pertinent to this permit, the District Director or his duly authorized representative
may by verbal order suspend the work until the violation is corrected. If the applicant fails or refuses
to comply promptly, the District Director or his authorized representative may issue a written order
stopping all or any part of the work. When satisfactory corrective action is taken, an order permitting
resumption of work may be issued.

Special Limitations: Per agreement with the B.L.M. & attached map.

[Signature]
(Signature of Applicant)

Approved by: [Signature]
District Director



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Moab District
San Rafael Resource Area
P. O. Drawer AB
Price, Utah 84501

IN REPLY
REFER TO:

9230
UT-060-6434
UT-060-6438
(U-067)

SEP 19 1983

Mr. Wendell Owen
CO-OP Mining Company
P. O. Box 1245
Huntington, Utah 84528

Dear Mr. Owen:

Right-of-way U-52411 was issued to Emery County on September 15, 1983, for the Bear Canyon Road. A copy of the agreement between your company and the County has been received. We are therefore closing Trespasses UT-060-6434 and UT-060-6438.

Sincerely yours,

Samuel R. Ranney
Area Manager

cc: Joe Helfrich, Utah Div. of Oil, Gas and Mining
4241 State Office Building, SLC, UT 84114

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

Barry A. Lusk
County Clerk

By *Russ 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. W. Stoddard*
a General Partner

PERMIT

10844

District No. 4 Date October 1, 1982 Application of Co-op Mining Company
By Sender Owen Title Manager

Address P.O. Box 1245, Huntington, Utah Phone 746-5238 in Garery County
is hereby granted, subject to the Regulations for the Control and Protection of State Highway Rights-
of-Way, Standard Specifications for Road and Bridge Construction, Specifications for Excavation on
State Highways, General Safety Orders of the Industrial Commission, Safety Manual for Road and
Bridge Construction, Instructions to Flagmen, the approved plans, and any special limitations set
forth herein, permission for the purpose of excavate to construct an approach 30' wide for a
coal haul road.

within right-of-way limits of Highway No. 31, State Maintenance Section No. 08-31-01
Milepost No. 32, in the following location:
about 12 miles northwest of the jct. of SR-10 & SR-31 on the east side
of the highway.

Receipt of \$5.00 permit fee is hereby acknowledged (delete where not applicable). The work permit-
ted herewith shall commence October 2, 1982 and shall diligently be prosecuted to completion. The
work shall be completed and all disturbed surfaces or objects restored on or before October 30,
1982. In the event work is commenced under this permit, the applicant agrees to prosecute the same
to completion by the date herein above specified. In the event the applicant fails or refuses to complete
the work the Utah Department of Transportation may, at its election, fill in or otherwise correct any
existing impediments at the expense of and subject to immediate payment by the applicant.

Applicant shall execute a bond in the minimum amount of \$1000, increased by multiples thereof as
determined by the District Director, to insure faithful performance of the permittee's obligation.
The bond shall remain in force for three years after completion of the work.

Before work permitted herewith is commenced, the applicant shall notify: John Cox at Huntington
887-9969 and commencement of said work is understood to indicate that the applicant
will comply with all instructions and regulations of the Utah Department of Transportation with respect
to performance of said work, and that he will properly safeguard said work to prevent accident and
shall indemnify and hold harmless the Utah Department of Transportation from all damages arising
out of any and all operations performed under this Permit.

Permittee shall not perform any work on State highway right-of-way beyond those areas or operations
stipulated on the permit.

If applicant fails to comply with Utah Department of Transportation regulations, specifications, or
instructions pertinent to this permit, the District Director or his duly authorized representative
may by verbal order suspend the work until the violation is corrected. If the applicant fails or refuses
to comply promptly, the District Director or his authorized representative may issue a written order
stopping all or any part of the work. When satisfactory corrective action is taken, an order permitting
resumption of work may be issued.

Special Limitations: Per agreement with the B.L.M. & attached map.

(Signature of Applicant)

Approved by: _____
District Director



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Moab District
San Rafael Resource Area
P. O. Drawer AB
Price, Utah 84501

IN REPLY
REFER TO:

9230
UT-060-6434
UT-060-6438
(U-067)

SEP 19 1983

Mr. Wendell Owen
CO-OP Mining Company
P. O. Box 1245
Huntington, Utah 84528

Dear Mr. Owen:

Right-of-way U-52411 was issued to Emery County on September 15, 1983, for the Bear Canyon Road. A copy of the agreement between your company and the County has been received. We are therefore closing Trespasses UT-060-6434 and UT-060-6438.

Sincerely yours,

Samuel R. Ramsey
Area Manager

cc: Joe Helfrich, Utah Div. of Oil, Gas and Mining
4241 State Office Building, SLC, UT 84114

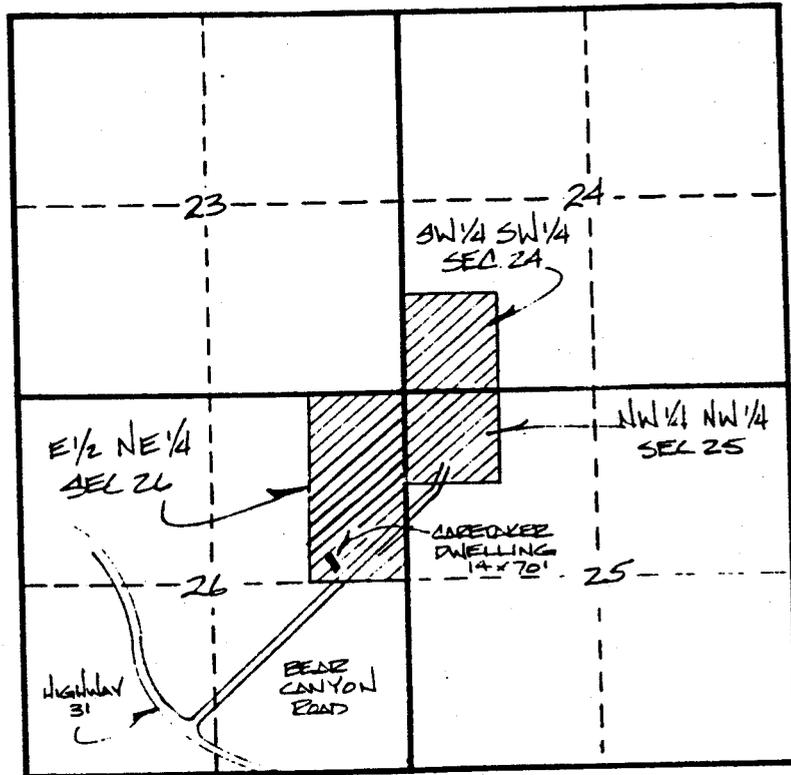
PROPERTY DESCRIPTION

THE SW¹/₄ OF THE SW¹/₄, SECTION 24,
T. 16 S., R. 7 E., S1B & M.

THE NW¹/₄ OF THE NW¹/₄, SECTION 25,
T. 16 S., R. 7 E., S1B & M.

THE EAST 1/2 OF THE NE¹/₄, SECTION 26,
T. 16 S., R. 7 E., S1B & M

CONTAINING 160 ACRES TOTAL



T. 16 S., R. 7 E., S1B & M

KEY MAP

Appendix 2-C



CERTIFICATE OF INSURANCE

SET TAB STOPS AT ARROWS
ISSUE DATE (MM/DD/YY)

8-7-85

PRODUCER

AMERICAN INSURANCE & INVESTMENT CORP.

450 SOUTH 900 EAST, SUITE 200
P.O. BOX 8489
SALT LAKE CITY, UTAH 84108-0489
PHONE (801) 364-3434

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER **A** Rockwood Insurance CompanyCOMPANY LETTER **B** Genstar IndemnityCOMPANY LETTER **C**COMPANY LETTER **D**COMPANY LETTER **E**

INSURED

Co-Op Mining Company
53 West Angelo Ave.
Salt Lake City, Utah 84115

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIABILITY LIMITS IN THOUSANDS			
						EACH OCCURRENCE	AGGREGATE	
A	GENERAL LIABILITY	GLA294754	4/28/85	4/28/86	BODILY INJURY	\$	\$	
	<input checked="" type="checkbox"/> COMPREHENSIVE FORM				PROPERTY DAMAGE	\$	\$	
	<input checked="" type="checkbox"/> PREMISES/OPERATIONS UNDERGROUND EXPLOSION & COLLAPSE HAZARD PRODUCTS/COMPLETED OPERATIONS				BI & PD COMBINED	\$ 500,	\$ 500,	
	<input type="checkbox"/> CONTRACTUAL				PERSONAL INJURY		\$	\$
	<input type="checkbox"/> INDEPENDENT CONTRACTORS							
	<input type="checkbox"/> BROAD FORM PROPERTY DAMAGE							
	<input checked="" type="checkbox"/> EXPLOSION HAZARD							
B	AUTOMOBILE LIABILITY	NEX24521	4/28/85	4/28/86	BODILY INJURY (PER PERSON)	\$		
	<input type="checkbox"/> ANY AUTO				BODILY INJURY (PER ACCIDENT)	\$		
	<input type="checkbox"/> ALL OWNED AUTOS (PRIV. PASS.)				PROPERTY DAMAGE	\$		
	<input type="checkbox"/> ALL OWNED AUTOS (OTHER THAN PRIV. PASS.)				BI & PD COMBINED	\$		
	<input type="checkbox"/> HIRED AUTOS							
	<input type="checkbox"/> NON-OWNED AUTOS							
	<input type="checkbox"/> GARAGE LIABILITY							
B	EXCESS LIABILITY	NEX24521	4/28/85	4/28/86	BI & PD COMBINED	\$ 2,500	\$ 2,500	
	<input type="checkbox"/> UMBRELLA FORM							
	<input checked="" type="checkbox"/> OTHER THAN UMBRELLA FORM							
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY			
					\$	(EACH ACCIDENT)		
					\$	(DISEASE-POLICY LIMIT)		
					\$	(DISEASE-EACH EMPLOYEE)		
	OTHER							

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

CERTIFICATE HOLDER

DIVISION OF OIL AND GAS MINING
355 W. N. TEMPLE
#3 TRIAD
SUITE 350
SLC, UTAH 84810-1203

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Chris Stokes / M

Appendix 2-D

AFFIDAVIT OF PUBLICATION

STATE OF UTAH }
County of Emery, } ss.

I, Robert L. Finney, on oath, say that I am

the Publisher of The Emery County Progress,

a weekly newspaper of general circulation, published at Castle Dale,

State and County aforesaid, and that a certain notice, a true copy

of which is hereto attached, was published in the full issue of

such newspaper for Four (4)

consecutive issues, and that the first publication was on the

1st day of April, 19 81, and that the

last publication of such notice was in the issue of such newspaper

dated the 22nd day of April, 19 81

Robert L. Finney

Subscribed and sworn to before me this

7th day of May, 19 82

Abelle Finney
Notary Public.

My Commission Expires October 28, 1983

Residing at Price, Utah

Publication fee, \$ 41.60

NOTICE OF FILING APPLICATION FOR COAL MINING AND RECLAMATION PERMIT

Co-op Mining Company, Box 300, Huntington, Utah, hereby announces its intent to file application for a coal mining permit for the Bear Canyon mine with the Division of Oil, Gas, and Mining under the laws of the State of Utah. A copy of the complete application is available for public inspection at the Emery County Recorder's Office, Emery County Court House, Castle Dale, Utah 84513. Written comment on the application should be submitted to the State of Utah Oil, Gas, and Mining Division, 1585 West North Temple, Salt Lake City, Utah 84116.

The area to be mined can be found on the USGS Hiawatha quadrangle map. The approximately 820 acres of the permit area are on private property (see coal area) described as follows:

Area 16 South; Range 7 East SLM

Sec. 14; SW ¼
Sec. 23; E ¼; E ¼ NW ¼, E ¼ SW ¼; SW ¼ SW ¼

Sec. 24; All West of the N-S fault

Sec. 25; All West of the N-S fault

Published in the Emery County Progress April 1, 8, 15 and 22, 1981.

APPENDIX 2-E

AUG 20 1964

APPENDIX 2-E

Currently, only one easement and one right-of-way intersect Co-op Mining Company Permit Area. Utah Power and Light Company has a power line easement attached herein and Emery County has a Road-Right-of-way addressed in Appendix 3.3.11-A.

There exists a Facto Right-of-way in the form of a water line owned and maintained by the Emery County Special Service District, however this Right-of-way is presently disputed and is pending legal solution.

Appendix 2-E
Pole Line Easement

11 55 3 19 16
W. J. P. 11/16/16

REF. 2.30

BOOK 28 PAGE 319-377

Nov 7 10 27 AM '17

NELLIE B. YOUNG
REORDER ENERGY COUNTY

374

POLE LINE EASEMENT

FREED COAL AND COKE COMPANY, a corporation, and HUNTINGTON CORPORATION, a corporation, herein called "Grantor", hereby convey to UTAH POWER & LIGHT COMPANY, a corporation, herein called "Grantee", for valuable consideration, an easement and right of way for the erection and continued maintenance, repair, alteration, and replacement of the electric transmission, distribution and telephone circuits of the Grantee, and 2 guy anchors and 14 poles, with the necessary guys, stubs, cross-arms and other attachments thereon, or affixed thereto, for the support of said circuits, to be erected and maintained upon and across the premises of the Grantor, in Emery County, Utah, along a line described as follows:

Beginning on west boundary line of Grantor's land at a point 1190 feet north, more or less, from the south quarter corner of Section 26, T. 16 S., R. 7 E., S. L. M., thence running N. 49 55' E. 3570 feet, more or less, thence N. 12 58' E. 1692 feet on said line, and being in the SW 1/4 of the SE 1/4, the N 1/2 of the SE 1/4 and the SE 1/4 of the NE 1/4 of said Section 26 and the W 1/2 of the NW 1/4 of Section 27, Township and Range aforesaid.

This conveyance is made subject to the following conditions and reservations:

1. There is reserved to the grantor the right to plant, cultivate and harvest crops or grass or conduct mining operations upon the rights of way herein granted and the right to construct, reconstruct, install, maintain, repair, renew, operate and use from time to time conduits, power lines, telephone lines, roads, railways or other structures, across, over or under said rights of way, with their appurtenances, at the option of the Grantor.

2. Grantee shall have the right of ingress to and egress from said rights of way over adjacent lands of the Grantor provided the Grantee shall, in the exercise of said rights, be limited to the use of existing roads and lanes across said lands; or, if no such roads or lanes be available, then to such routes thereover as shall be most convenient and at the same time cause the least possible injury to said lands of the Grantor, or to the crops, trees, buildings or other structures growing or situated thereon.

3. Grantee shall repay the Grantor, on demand, the reasonable value of animals, crops, trees, buildings or other structures injured, damaged or destroyed by the Grantee, its officers, employees, contractors or servants, in the exercise of any right herein conveyed.

4. Grantee shall indemnify and save harmless the Grantor, and any director, officer, servant or employee of the Grantor, from any and all claims, liabilities or expenses, whether for injuries, damages or otherwise, caused by or resulting from any act, negligence or omission of the Grantee, its officers, employees, contractors or servants, in the exercise of any right herein conveyed.

5. The rights of way herein described are conveyed subject to any rights of way, leases and agreements heretofore granted or made by the Grantor or its predecessors in interest.

6. The rights, reservations, conditions and obligations herein set forth are not transferable or assignable by the Grantee except to a successor of its entire business.

7. All rights herein granted shall forthwith cease and determine at the election of Grantor upon the giving of one (1) year's advance written notice to Grantee.

IN WITNESS WHEREOF the Grantor has executed this conveyance this 15th day of October, 1957.

FREED COAL AND COKE COMPANY

BY: Frederick L. Anderson
President

BY: Laurence G. Duerig
Secretary

STATE OF ~~the~~ California }
COUNTY OF Santa Clara } ss.

On this 15th day of October, 1957, before me Josephine J. Douglas, a Notary Public in and for the County of Santa Clara, State of California, residing therein, duly commissioned and sworn, personally appeared Frederick L. Anderson and Laurence G. Duerig known to me to be the persons whose names are subscribed to the within instrument, who being by me duly sworn, did say that they are the President and Secretary of Freed Coal and Coke Company, a corporation, and that said instrument was signed in behalf of said corporation by authority of a resolution and said Frederick L. Anderson and Laurence G. Duerig acknowledged to me that said corporation executed the same.

Josephine J. Douglas
Notary Public

My Commission expires: July 27, 1958

Residing at 677 Arboleda Dr., San Alito, Calif.

HUNTINGTON CORPORATION

BY: Frederick L. Anderson
President
Laurence G. Duerig
Secretary

STATE OF California }
COUNTY OF Santa Clara } ss.

On this 15th day of October, 1957, before me Josephine J. Douglas, a Notary Public in and for the County of Santa Clara, State of California, residing therein, duly commissioned and sworn, personally appeared Frederick L. Anderson and Laurence G. Duerig, known to me to be the persons whose names are subscribed to the within instrument, who being by me duly sworn, did say that they are the President and Secretary of Huntington Corporation, a corporation, and that said instrument was signed in behalf of said corporation by authority of a resolution and said

377

Frederick L. Anderson and Laurence G. Duerig acknowledged
to me that said corporation executed the same.

Josephine J. Douglas
Notary Public

My Commission expires:
MY COMMISSION EXPIRES JULY 27, 1959.

Residing at

677 Arboleda Dr, Los Altos, Calif.

ATB
COA.

CHAPTER 3

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 - 3.3.8 Water diversion
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 - 3.3.12 Topsoil
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 - 3.5.4 Preservation of soil resources
 - 3.5.5 Protection of vegetative resources
 - 3.5.6 Protection of fish and wildlife
 - 3.5.7 Protection of air quality
 - 3.5.8 Subsidence control plan
 - 3.5.9 Waste disposal
- 3.6 Reclamation plan
 - 3.6.1 Contemporaneous reclamation
 - 3.6.2 Soils
 - 3.6.3 Final abandonment
 - 3.6.4 Backfilling and grading
 - 3.6.5 Revegetation
 - 3.6.6 Schedule of reclamation
 - 3.6.7 Reclamation Bonding
 - 3.6.8 Alluvial Valley floors

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Appendix 3.3.4-A	Existing Structures
Appendix 3.3.6-A	Water Rights
Appendix 3-B	Roof Control Plan
Appendix 3-C	Interim Reclamation Plan
Appendix 3-D	Topsoil
Appendix 3-E	Toxic Materials & Handling
Appendix 3-F	Stability analysis
Appendix 3-G (3.3.11A)	Class I Road Reclamation
Appendix 3-H (3-5-8A)	Renewable Resource Survey
Appendix 3-I	Blind Canyon Intake Portal

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3.1 SCOPE

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This part describes the action and procedures of Co-Op Mining Company to satisfy the requirements for underground mining operations and reclamation.

3.2 SURFACE FACILITIES - EXISTING

The mine which existed at the proposed site has been abandoned for over 30 years and subsequently there is no evidence of long existing facilities.

3.3 SURFACE FACILITIES - NEW

Subsection 3.3.1 and 3.3.2 deal exclusively with proposed new facilities.

3.3.1 SITE SELECTION AND PREPARATION OF PROPOSED FACILITIES

Plate 2-2 is an overlay of the new location of all surface facilities. In addition, an accurate determination of where each facility is in relation to the existing topography as well as structural fixtures such as highways.

3.3.2 PORTALS

The mine has 3 existing portals (Fan, Intake & Belt). A fourth

3.3.3 SURFACE BUILDING AND STRUCTURES

The present plan calls for the following structures:

Surface structures will consist of; a single building complex containing shops, parts warehouse, bath house, and mine offices; truck scales, weighman office, cartaker dwelling, mine run coal receiver bin, crushing and sizing structure, truck load out bins, stockpile towers, and conveyors to carry coal to storage and load out sites, etc.. A complete list is in Appendix 3.3.4-A and shown on Plate 2-2. Detailed plans for each structure are attached in Addendum 3.3.4-A Plans.

3.3.4 COAL HANDLING, STORAGE AND LOADING

Coal carried from the mine by conveyor belt to a receiver bin, conveyed to the sizing and crushing plant, the lump removed and diverted to the lump bin, the rest of the oversized crushed, and the coal sized to meet the various requirements of the different customers, then conveyed to the truck load out bins, or the stockpile area.

3.3.5 POWER SYSTEM, TRANSMISSION LINES AND SUBSTATIONS

Power will be delivered by U.P. & L. Transmission lines at

12,500 V. direct to a substation (See Plate 2-2), reduced to 480 V. for tiple use, and to 240 V. for shop and other use.

Surface power systems, transmission lines and substations will be removed and the areas reclaimed as prior when they are no longer required.

3.3.6 WATER SUPPLY SYSTEM

A water right transfer has been applied for ; if this is approved, a cistern system would be utilized. (See Appendix 3.3.6-A)

The system, which carries water from the mine or cistern to the loadout area, wash plant, bathhouses and offices, consists of a 2-inch pipeline and water storage tanks will be removed. The area will be topsoiled and revegetated. Plans and permit applications are attached in Appendix 3.3.6-A.

3.3.8 WATER DIVERSION STRUCTURES

Water diversion structures will be maintained until revegetated areas are well established and stable. Unless an accepted and approved use for these is established after mining they will be removed as above; graded and revegetated.

3.3.9 SEDIMENTATION CONTROL AND WATER TREATMENT FACILITIES

This facility will be maintained as long as it is required to meet the effluent limitations of applicable federal or state laws for runoff or drainage. When their usefulness is ended, they will be removed and the sites reclaimed as described previously.

3.3.10 STORAGE, WASTE AND REFUSE AREAS

Co-op disposes of underground development waste in abandoned areas underground in line with UMC 817.71-74 and MSHA regulations.

3.3.11 TRANSPORTATION, ROADS AND PARKING AREAS

Roads and parking areas will be treated in the same manner as other working areas. Any asphalt or treated surfaces will be removed prior to rehabilitated upon completion of mining. See Plate 3-1 and road agreement under Appendix 3.3.11-A.

The Bear Canyon Road is approximately 1800' long from the gate to the scale house as shown on Plate 3-5. This road is constructed 30' wide and is surfaced with 6" of $-3/4$ "

gravel, crowned in the middle as shown on the cross section. Drainage will be provided along the road by ditches with a minimum depth of 1.8 feet. Erosion protection, such as straw bales at 100' intervals or 6" median diameter riprap on bed of -1" gravel 6" thick, shall be provided in all areas where velocities are expected to exceed 5 ft. per sec. Culverts are installed as shown on the drawings; in addition, the two proposed 30" of headwater depth is available to allow for a variance to allow the 18" culverts to pass the 10 year-24 hour storm event. The culvert on the submitted drawing is to scale, and was installed with a trash rack to prevent plugging, a rock headwall at the inlet, and riprap at the outlet to prevent erosion.

This road will be maintained in such a manner that the performance standards will be met throughout the life of the entire transportation facility, including maintainance of the surface, shoulders, parking and side areas, and erosion control structures for safe and efficient utilization of the road.

Upon completion of the operation and reclamation of the mine site disturbed area, it is anticipated that this portion of the Bear Canyon Road will also be reclaimed. This will occur at approximately the same time as the final removal

of the sedimentation pond and diversions on the mine site. The road surfacing material will be removed and either salvaged or disposed of within the pond site and buried. The reclamation will then be accomplished by ripping up the remaining base, spreading the material across the (roadway) disturbed area, and planting the area with the approved seed mix. During this time, all culverts shall be removed and either salvaged or disposed of in an approved landfill, and the natural drainage patterns shall be restored.

The mine area and portal access road is approximately 2,112' long. A cross section and profile of this road is shown on Plate 3-5. Culvert locations and sitches are also shown on this drawing, as well as on Plate 3-1. This road is primarily used for access to the mine portals and other facilities. The road was originally constructed for access to the old Bear Mine, and has since been widened and fitted with proper drainage controls to protect the environment. The road is designed, used and maintained to meet the requirements of UMC 817.151 - 817.156, and to control or minimize erosion and siltation, air and water pollution, and damage to public or private property.

The road is located along the canyon floor above the stream, and along the stable slope leading to the portals. The overall grade of the road does not exceed 1v:10h (10%) and the maximum pitch grade does not exceed 1v:6.5h (15%). The horizontal alignment is consistent with the existing topography and with the volume, speed, and

weight of anticipated traffic.

As mentioned earlier, the initial road was constructed under pre-law conditions, using the cut/fill side-cast method. A stability analysis was performed on the road Dames and Moore in 1981 (Appendix 3-F). Their conclusion was that the Bear Canyon Portal Access Road has a stability factor of safety of a minimum of 1.43, and ranges upward to 2.15.

Ditches and culverts have been added to the road to control runoff and safely pass the runoff from a 10 year-24 hour precipitation event. (See Plate 3-1 and 3-5). Ditches shall be maintained at a minimum depth of 1.8 feet, and at least 30" of headwater depth will be maintained at the inlet of the 18" culverts. Culverts are fitted with trash racks to prevent plugging, and buried and compacted a minimum of 30" to prevent crushing. In areas where velocities of runoff exceed 5 fps, erosion protection such as straw bales at 100' intervals or 6" median diameter rip-rap on a bed of gravel/sand 6" thick shall be maintained. Culvert spacing conforms with the requirements of UMC 817.153(c)(z)(i) Rock or concrete headwalls shall be other erosion protection shall be the outlet.

The road is surfaced with 4" of 3/4 gravel, and is main-

tained in such a manner that the approved design standards are met throughout the life of the facility. Damage to the road from use or weather events shall be promptly repaired.

This road shall be removed upon completion of the mining operation. The timing and procedure of removal and reclamation is discussed in detail under the Backfilling and grading Plan in Sec. 3.6.4 A detailed description of each road is included in Appendix 3-G.

All roads, conveyors and other facilities shall be maintained in such a manner to prevent damage to fish, wildlife, and related environmental values. This is accomplished by:

1. Maintaining hydrologic controls, such as ditches, culverts, diversions and sedimentation ponds to assure that disturbed drainages are either held or cleared before releases.
2. Watering of roads as necessary to reduce fugitive dust
3. Protection of wildlife within the permit area and reporting of sightings of threatened and endangered species.
4. Contemporaneous reclamation.
5. Advocating good-housekeeping practices to reduce the possibility of contamination of surface waters in area.

6. Co-op is committed that all support facilities will be restored to prevent damage to fish, wildlife and related environmental values and the possibility of additional contributions of suspended solids to streamflow or runoff outside the permit area will be minimal.

3.3.12 TOPSOIL STORAGE PILES

Topsoil storage piles are located as shown in Plate 2-2. This material will be recovered as needed to carry out the reclamation plan described herein.

3.3.13 EXPLOSIVES STORAGE AND HANDLING

Cp-Op does have an explosives facility within the permit area. Co-Op does not anticipate the use of explosives in their normal mining operation. However, in the unlikely event the need arises in the underground operation the following procedures will be adhered to:

USE OF EXPLOSIVES

There will be no surface blasting activities incident to this underground operation. There is a possibility that the need to use explosives in the underground operation to advance

through faults, dikes, or other rock strata too hard for cutting by the continuous miner. Any use of explosives in the underground operation will be in compliance with all applicable state and federal laws, and will be conducted by persons trained, examined and industrial Commission. Blasting material will be stored in fire proof bullet proof magazines and clearly designated as an (Explosives Storage Area), as required by state and federal laws.

Co-op will adhere to all State and Federal requirements, regulations and mandates applicable to the prescribed use and quantity. Including, but not limited to:

A federally approved storage facility.

An individual trained and certified in the use of explosives.

All forms, notifications and reporting procedures.

3.3.14 RELOCATION OR USE OF PUBLIC ROADS

There are no public roads within the permit area.

3.3.14.1 PROTECTIVE MEASURES

Access roads will be posted with "Authorized Personnel Only", speed and road information signs upon entrance to the property; use of these roads is restricted to authorized

personnel. Security is maintained by adequate security personnel.

3.3.14.2 MAPS

Plate 2-2 Shows the location of all roads in the permit area.

3.3.14.3 CROSS-SECTION

Plans and cross-section of the new access road to the portal area are shown on Plate 3-1 and section D-D; Mine Access Road - Construction Plan.

3.3.15 TOTAL AREA FOR SURFACE DISTURBANCE DURING PERMIT TERM

Total area of surface disturbance during the permit term is approximately 10 acres. Individual areas are shown on Plate 3-2.

3.3.16 ADDITIONAL AREA FOR SURFACE DISTURBANCE FOR LIFE OF MINE

Surface disturbance in addition to what has already been disturbed is not anticipated.

3.3.17 DETAILED CONSTRUCTION SCHEDULE

Construction of coal handling and processing facilities to begin on or about April 1, 1981, scheduled for completion by Nov. 1, 1985. Construction of truck scale and caretaker dwelling to begin on or about Sept. 1, 1982, scheduled for completion by Dec. 1, 1985. Construction of shop complex to begin on or about Aug. 15, 1983, scheduled for completion on or about Oct. 1, 1985.

3.4 OPERATION

We are entering the first coal seam through an existing mine. The underground plans, (roof control, ventilation, barrier pillar, and etc.) included as Appendix 3-B.

3.4.1 MINING PLANS

There are three seams in the Bear Canyon Property, the Upper Bear, (upper), the Bear or Blind canyon seam (middle), and Hiawatha (lower). The old existing mine is in the middle seam. Our projected plan is to begin mining in the existing mine.

3.4.1.1 PORTALS, SHAFTS AND SLOPS

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3.3.17 DETAILED CONSTRUCTION SCHEDULE

Construction of coal handling and processing facilities to begin on or about April 1, 1981, scheduled for completion by Nov. 1, 1985. Construction of truck scale and caretaker dwelling to begin on or about Sept. 1, 1982, scheduled for completion by Dec. 1, 1985. Construction of shop complex to begin on or about Aug. 15, 1983, scheduled for completion on or about Oct. 1, 1985.

3.4 OPERATION

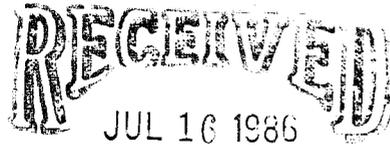
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We are entering the first coal seam ^{DIVISION OF} ~~division~~ of an existing mine. ^{OIL, GAS & MINING} The underground plans, (roof control, ventilation, barrier pillar, and etc.) included as Appendix 3-B. The following operation plans for the mining will pertain to the existing operation in the Bear Canyon Seam and to the proposed mining in the Hiawatha Seam.

3.4.1 MINING PLANS

There are three seams in the Bear Canyon Property, the Upper Bear, (upper), the Bear or Blind Canyon Seam (middle), and Hiawatha (lower). The old existing mine is in the middle seam. Our projected plan is to begin mining in the existing mine. The lower (Hiawatha) seam is also projected to be mined. The mine plan and sequence for the lower seam mining is shown on Plate 3-4A. There are no plans to mine the uppermost seam in

See Plate 2-1.



3.4.1.2 MINING METHODS

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Mining in both the Bear Canyon and Hiawatha Seams will be done by continuous miners. The miners will be discharged into shuttle cars (diesel or electric) which carry the coal to the feeder breaker. The feeder breaker discharges the coal onto the belt conveyor where it is taken out of the mine.

The main entries consist of a five-entry system on 80' - 100' centers to be driven to the property limits. Sub-mains consisting of five entries on 83' centers are then driven off the mains and room-and-pillar panels are developed off the submains. Rooms are developed within the panels on 70' - 83' centers. The pillars are then recovered according to the approved plan. Timber is installed to support the roof and provide for breaker control of caving roof. Retreat mining of this type will provide a recovery of 75% - 78% within the panels. As the panel retreat is completed, the sub-mains will be pulled back to the barrier pillars left along the mains. The mains will be pulled upon final retreat of the mine operation.

Mining plans and sequences for the Bear Canyon and Hiawatha Seams are shown on Plates 3-4 and 3-4A respectively. As can be seen, the lower seam workings are planned to be columnized with the upper as closely as practicable. The mining plan

sequence allows for recovery of the upper seam areas prior to final recovery of the lower seam. This procedure is consistent with accepted engineering practice in multiple seam mining.

3.4.1.3 PROJECTED MINE DEVELOPMENT

See Plate 3-4 and 3-4A.

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3.4.1.4 RETREAT MINING

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Underground coal mining procedures follow two basic approaches to the recovery of involved reserves. These are advancing and retreating. Sometimes considerable advantage can be developed and then mined from the most remote area back to the portal. However, this is not generally possible. As a result, development work and mining are usually accomplished simultaneously as the workings advance into the property. Depending upon the mine layout, this can become retreating and mine back to the portal. Thus, we have an advance-retreat situation for the entire property.

This concept can be applied to various parts of the main entries, submain entries and even panels.

See Plate 2-1.

3.4.1.2 MINING METHODS

Room & Pillar Methods will be employed.

3.4.1.3 PROJECTED MINE DEVELOPMENT

See Plate 3-4.

3.4.1.4 RETREAT MINING

Underground coal mining procedures follow two basic approaches to the recovery of involved reserves. These are advancing and retreating. Sometimes considerable advantage can be developed and then mined from the most remote area back to the portal. However, this is not generally possible. As a result, development work and mining are usually accomplished simultaneously as the workings advance into the property. Depending upon the mine layout, this can become retreating and mine back to the portal. Thus, we have an advance-retreat situation for the entire property.

This concept can be applied to various parts of the main entries, submain entries and even panels.

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If mining advances along both sides of any set of entries from their starting point to their termination, the system is advancing; if mining is not started until the entries reach their limit and then begins at the termination point on both sides, the system is retreating. If mining begins at the initiating point of the entries on one side and advances to the end, then moves to the other and works out to the starting point, it becomes an advance-retreat system.

Frequently this method is attractive, as it permits high production work to proceed in combination with development, creates favorable strata control conditions and, if done properly, facilitates ventilation and enhances safety of the operation. An overall advance-retreat system is used, the faces will retreat along the panel entries.

Advance-retreat is not to be confused with first and second mining, which applies primarily to room and pillar work. First mining refers to the excavation of rooms and entries, leaving the intervening pillars of coal in place. Second mining can accompany first mining as it advances into a solid block of coal, in which case it is advancing; or it can retreat through an area which has been first-mined. The former is probably the safer and preferred method. It will be used where second mining is applicable in the Bear Canyon Mine.

3.4.1.5 ROOF CONTROL, VENTILATION, WATER SYSTEMS, DUST
SUPPRESSION, DEWATERING AND ELECTRICAL

a. ROOF CONTROL

Roof control is described in the approved roof control plan (Appendix 3B). Basically, mine roofs are bolted on 5-foot centers with either expansion shield or resin grouted bolts not less than 48 inches long. Roof bolt Plates and, if desired, wooden cap pieces are used. Wooden posts and cap pieces can also be installed as needed.

Generally, roof strata are not expected to create major difficulties. The roof of the coal seams are predominately sandstone; it provides good anchorage for roof bolts.

Floor strata throughout appear to be adequate and should create few problems. Some minor floor heaving may occur.

b. VENTILATION

A fan with a combined capacity of 850,000 CFM supply air to the underground mining units.

Intake air is carried in the entries on one side of a set, while return air is carried through the entries on the other

side. Air is directed through the mine by stoppings, doors, overcasts, regulators and brattice cloth. After sweeping the working faces of each section the air is directed into the return aircourses and out of the mine. Little or no methane gas is generated in any of the Blackhawk seams.

c. DEWATERING, WATER SYSTEMS AND DUST SUPPRESSION

Water generated in the mine is collected in sumps and used at the mine. Some water from the roof is collected and pumped directly outside for use in the bathhouses and as drinking water in the offices. Tests for potability are made bi-monthly. Water also serves for sprays on the machines at the working faces, on the coal at belt heads and transfer points and for the wash plant. Presently water generated is used or contained at the mine; there is no discharge to surface waters. However, a National Pollution Discharge Elimination System (NPDES) permit has been obtained in case increased volumes are encountered.

d. ELECTRICAL

Electric power is currently purchased from a public utility at 12,500 V. and distributed over the surface of the property through company-owned overhead and buried trans-

Table 3-1
Coal Reserves - Bear Canyon Mine

Coal Seam	Surface Acres of Seam	Avg. Thickness of Coal	Coal Reserves	
			In Place	Recoverable
Bear Canyon Seam	750	10'	13,065,500	6,532,500
Hiawatha Seam	800	5'	6,968,000	3,484,000
TOTAL			20,033,000	10,016,500

- Note: (1) In place coal reserves are based on average coal heights times number of acres times 80 lbs./cu.ft. divided by 2,000 lbs./ton.

$$\text{Ht.} \times \text{Area} \times 80\#/ft.^3 \div 2,000 \text{ lbs./ton} = \text{Ton reserve in place}$$
- (2) Recoverable reserves are based on 50% of in-place reserves. The 50% figure has proven to be a good estimate of recoverable reserve on an entire property.

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Table 3-1
Coal Reserves - Bear Canyon Mine

Coal Seam	Surface Acres of Seam	Avg. Thickness of Coal	Coal Reserves	
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Bear Canyon Seam	750	10'	13,065,500	6,532,500
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TOTAL			20,033,000	10,016,500

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3.4.2 BARRIER PILLARS

Pillars of coal generally are left underground to protect a surface or underground feature which must be maintained and protected for the life of the mine (main entries) or permanently (oil or gas wells). The size of some is specified by law; others are designed by the operator to provide the protection needed. Those along the outside property boundary will be 100 feet wide. Shaft pillars will be large enough to prevent damage by subsidence, outcrops will be protected by a minimum of 200' barrier pillars.

3.4.2.1 PROTECTION OF OIL, GAS AND WATER WELLS

There are no active or abandoned oil or gas wells within the permit boundary.

3.4.2.2 PROTECTION OF MANMADE FEATURES (SURFACE & SUBSURFACE)

Manmade features and structures do not exist on the mineable portion of the permit area. There are some forest trails but they are all located beyond the coal outcrops. Maximum coal recovery in the controlled uniform manner planned for this mine should result in even surface substance with mini-

mum disturbance.

3.4.2.3 PROTECTION OF NATURAL SURFACE STRUCTURES & STREAMS

Co-op is committed to maintain a minimum of a 200' barrier pillar to the outcrop to minimize detrimental impacts to nesting raptor in the event of an escrapment failure. The stream channels will be safe on all disturbed waters.

3.4.2.4 PROPERTY BOUNDARIES

Area boundries of individual leases and fee property are shown in Plate 2-1. Total area covered by this permit is that enclosed by the heavy outside line. Protection of these lines and property adjacent to the permit area is provided by continuous barrier pillars 100 feet wide enough to prevent subsidence across the boundary resulting from angle of draw.

3.4.2.4.1 BUILDINGS WITHIN 1,000 FEET OF PERMIT AREA

No buildings lie within 1,000 feet of the permit area.

3.4.2.4.2 EXISTING PUBLIC ROADS

The main access road to the property is a public road. It

provides access from Huntington Canyon to the mine. Access beyond the gate entrance to the mine is controlled by the company and the road is posted with no trespassing, speed control and general traffic control signs. When mining has been completed, the road would be reclaimed.

3.4.2.5 OUTCROP PROTECTION

In most areas, the coal outcrops are buried. that is, they are not visible from the surface, either because they are covered to some depth either overburden or because, in many areas, the coal has been burned for some distance from the surface. Where neither of these situations exist, routine tests of the coal may show that it has been "weathered" or "oxidized" and mining would be stopped within 200 feet of the outcrop.

3.4.3 CONSERVATION OF COAL RESOURCE

Maximum recovery of this reserve will be practiced from the time Co-op Mine begins mining on this property. In addition, mining plans have established mine layouts to reach all areas of the property and, at the same time, by the adoption of pillar recovery techniques in room and pillar work, raise the percentage of recovery of reserves in the mining area.

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to the maximum. Whereas room and pillar methods without pillar mining recover approximately 50% of the coal, the above procedures show recovery of close to 60% overall.

Seams will be mined to a minimum thickness of 5 feet which is the lower limit for operation of the equipment that must also mine to full seam heights of 10 feet or more.

Barrier pillars to protect main and submine entries have been made large enough (200 feet or greater) to assure prevention of the entries for their useful life. When the area they service is mined out, the entry pillars will be recovered on the way out.

3.4.3.1 RECOVERY FACTORS

Various factors and combinations of factors affect the amount of coal recovered from any given area of a reserve. Natural conditions such as incompetent roof strata, soft floor strata, water, depth of overburden and residual tectonic forces in the strata influence operating procedures and their layout, mining sequences and operating procedures can significantly influence the amount of overall recovery.

Present indications of natural conditions within the permit area are encouraging. Roof and floor conditions are generally satisfactory with the exception of some faulting, which may create difficulties.

Burned areas of coal along the outcrops also are not definitely delineated. This will affect the total in-place reserve estimate if such burning has penetrated the seam to a greater distance than anticipated.

Co-op Coal Company's engineers have assured recovery of the highest percentage of in-place reserves by adoption of sound engineering principles in design and strict observance of these principles in operation.

3.4.3.2 PROJECTED MAXIMUM RECOVERY AND RATE

The mining systems adopted by Bear Canyon Mine for use on this property will assure maximum recovery of the most advanced current mining technology and equipment. Pillar recovery in room and pillar work follows procedures that assure thorough and uniform removal of the coal to maintain effective roof control over the working and adjacent areas.

3.4.3.2.1 RECOVERABLE RESERVES IN THE PERMIT AREA

Table 3-1 Section 3.4.1 shows the reserves in each seam determined from our most recent data.

Co-Op Coal Company plans to extract all coal reserves to the extent allowed by economics, safety conditions and prudent mining practice, from the lands it controls.

The "upper seam" in this area is the Upper Bear Canyon Bed, which is probably just a split off the main Bear Canyon Seam in which the mine is located. This seam lies only 15' to 20' above the Bear Canyon Seam at the minesite, and is evidenced only by a ledge and some burning. Speiker and Doelling have both referred to a probable upper split of the Bear Canyon Seam in this area, likely with a small lateral extent and little, if any, mining potential. An additional seam outcrops about 200' above the mine portals; however, this is one of the "upper beds" listed on Table 1, page 6-15, and again is not considered to have any economic potential due to limited lateral extent and extreme burning of seams in this horizon (Doelling p. 6-14).

Due to the burning, questionable lateral extent and inability to trace these upper seams (or splits), and due to the close proximity of the upper Bear Canyon split to the main bed presently being mined, there are no plans to enter or mine these upper seams.

These seams (or splits) are not considered as mineable reserves; therefore, the seam presently being mined is considered the uppermost, minerable seam in the area. This is consistent with mining practices recommended for multiple seam areas.

The reserves shown on Table 3-1 reflect mineable coal only Bear Canyon and Hiawatha Seams. These reserve estimates are based on numerous outcrop measurements as well as in-seam measurements, both in Bear Canyon and Trail Canton. (See Fig. 3.4-1 thru 3.4-4). Based on these measurements, and using a 2500' radius of influence from a known coal height, it was determined that an average coal height of 10' was an acceptable (although conservative) figure to use for the Bear Canyon Seam. By the same method, an average height of 5' was determined for the Hiawatha Seam. The reserves in place were then calculated by multiplying the number of acres of mineable coal by 1972 tons/acre ft. (80 lbs./cu. ft. coal in place) times the average coal height for each seam. The recoverable coal reserves was then estimated by multiplying the in-place reserve by a recovery factor of 50%. A 60% recovery factor could be used based on actual recovery experience by Co-Op Mining Company in the seams in this area; however, the 50% factor was used to assure the reserve estimate is conservative.

Co-Op plans to enter the Hiawatha Seam at a later date, although, at this time it is not known precisely when that will occur, or at what location. It is possible that access to the lower Hiawatha Seam may prove to be most economic through new portals in the outcrop; however, as mining progresses, and fault location and displacements are better delineated, it may become even more feasible and less environmentally destructive to enter the lower seam through rock tunnels. In any event, Co-Op will commit to provide the Division with complete plans for entering the lower seam prior to taking such action. These plans will be submitted as a modification to this MRP and will be submitted in a timely manner to allow for review and approval prior to commencing work on entering the Hiawatha Seam.

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Co-Op plans to enter the Hiawatha Seam at a later date, although, at this time it is not known precisely when that will occur, or at what location. It is possible that access to the lower Hiawatha Seam may prove to be most economic through new portals in the outcrop; however, as mining progresses, and fault location and displacements are better delineated, it may become even more feasible and less environmentally destructive to enter the lower seam through rock tunnels. In any event, Co-Op will commit to provide the Division with complete plans for entering the lower seam prior to taking such action. These plans will be submitted as a modification to this MRP and will be submitted in a timely manner to allow for review and approval prior to commencing work on entering the Hiawatha Seam.

3.4.3.2.1.1 RIDER SEAMS

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Available information on rider seams is presented in Section 3.4.3.2.1 (p. 3-18) and in Section 6.5.2.3 (p. 6-15) of this MRP. Available borehole data is shown in Figures 3.4-1 through 3.4-4, and in Appendices 6-A and 6-B of this permit. Locations and elevations of all test borings are shown on Plates 6-B and 3-4.1.

The only potentially "mineable" rider seams in the area are the "upper beds" some 200' above the Bear Canyon portals, and the Upper Bear Canyon (or Blind Canyon) Seam 15' - 20' above the

Bear Canyon Seam. As discussed on page 3-18 of this MRP, these seams have been verified in the field as having no economic potential due to extreme burning of the (upper beds", and the small lateral extent and close proximity of the Upper Bear Canyon Bed. For this reason, the Bear Canyon Seam is considered the uppermost mineable seam in this area. No rider seams of any importance are known to exist in the interval between the Bear Canyon and the Hiawatha Seams. The Hiawatha Seam is therefore considered to be the lowest, and only other economically recoverable coal seam in the permit area.

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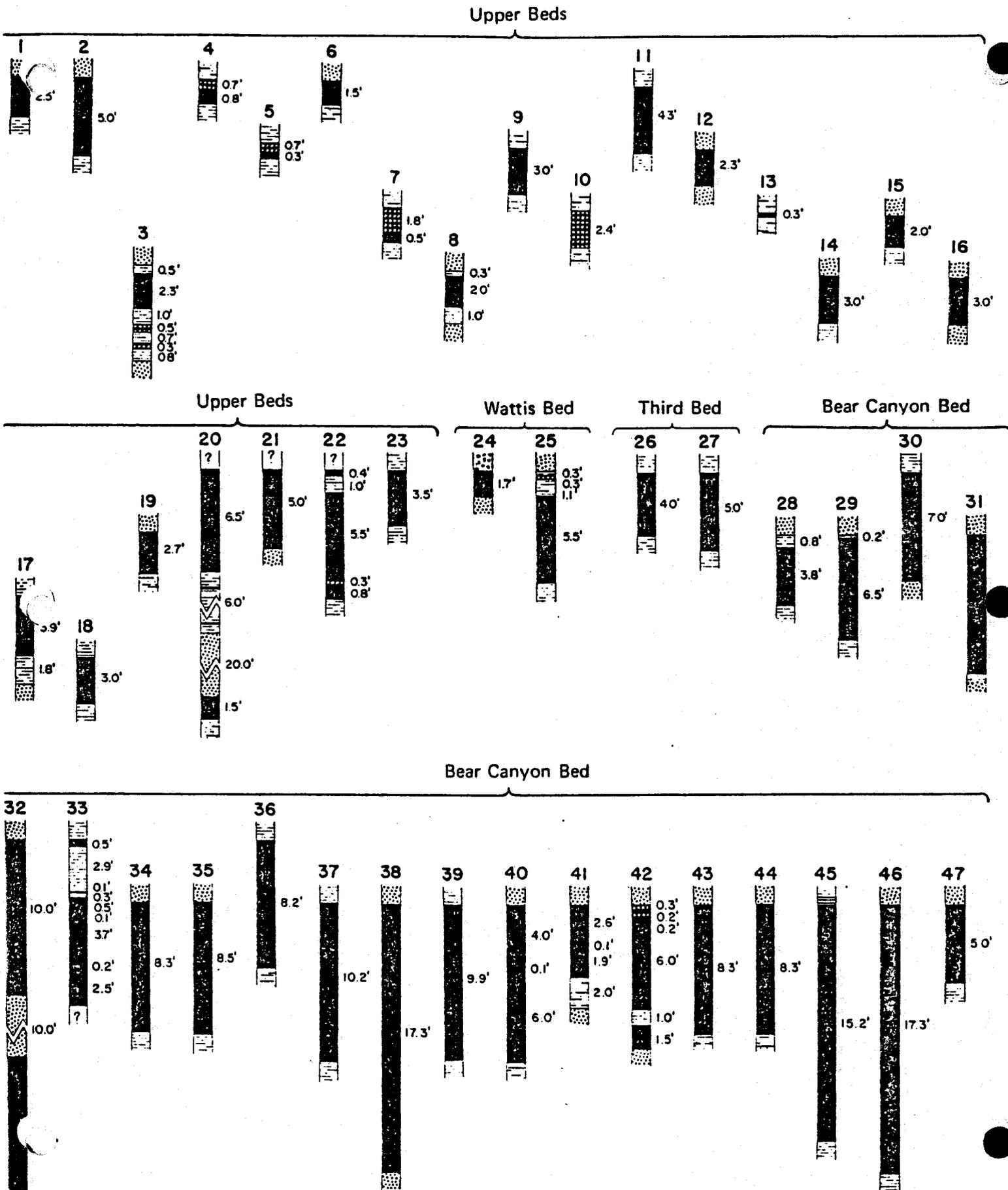
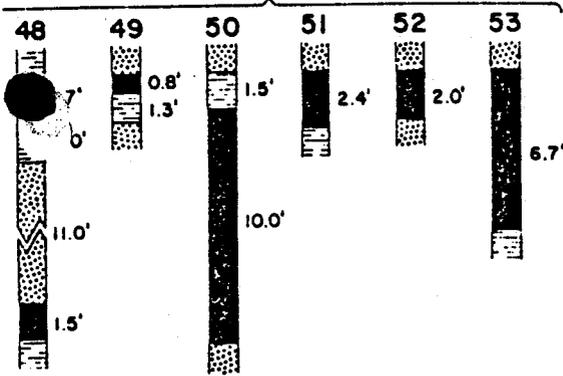
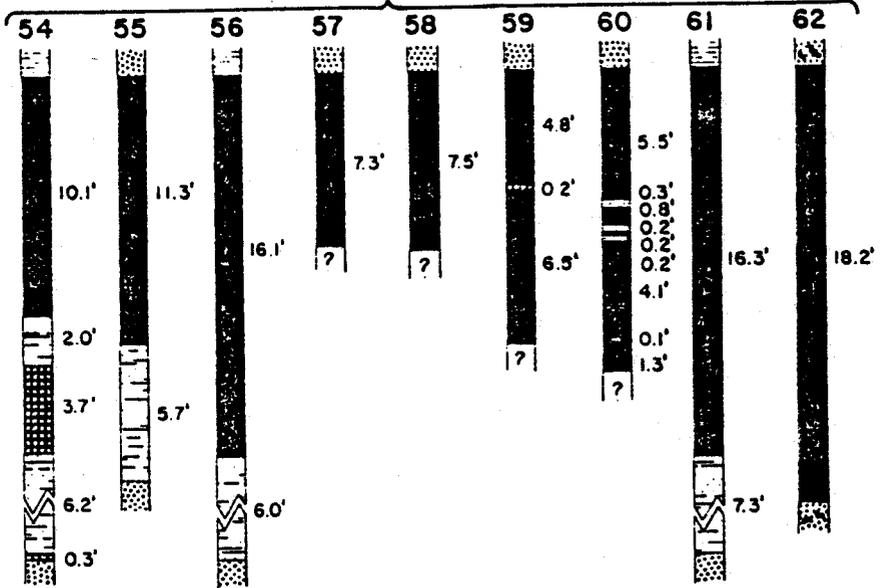


FIGURE 3.4-2

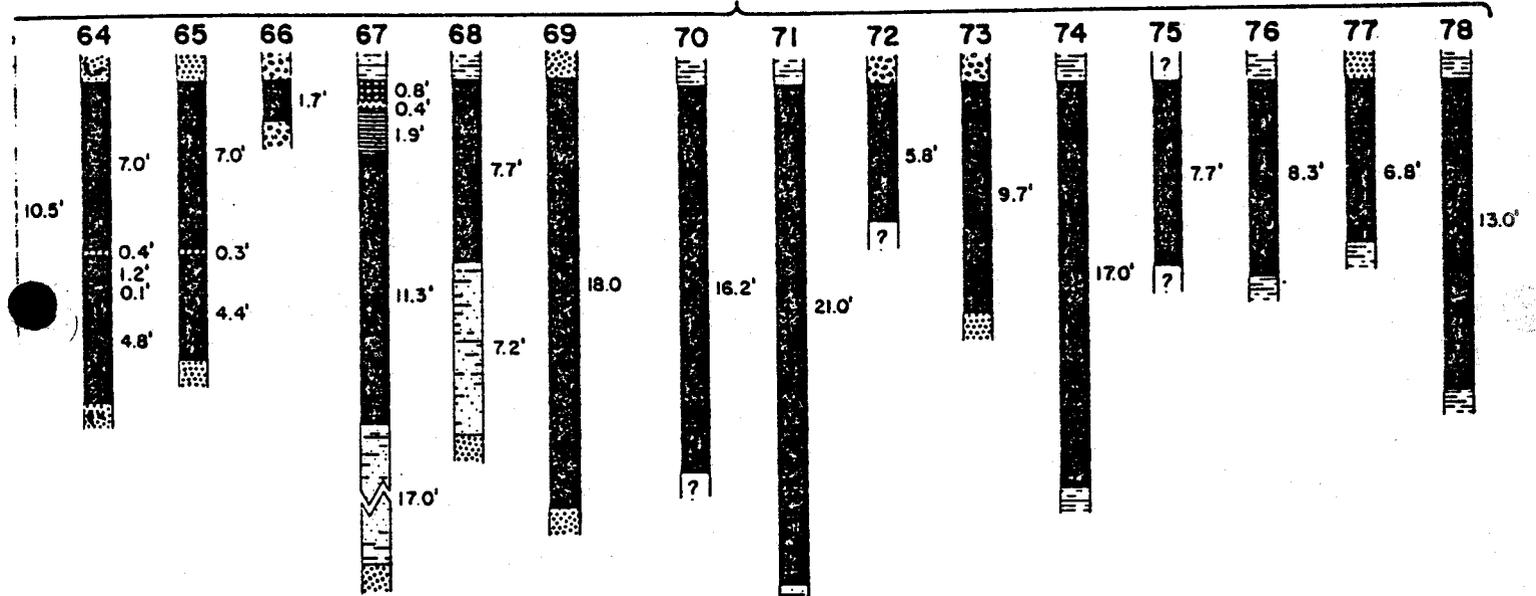
Blind Canyon Bed



Hiawatha Bed



Hiawatha Bed



Hiawatha Bed

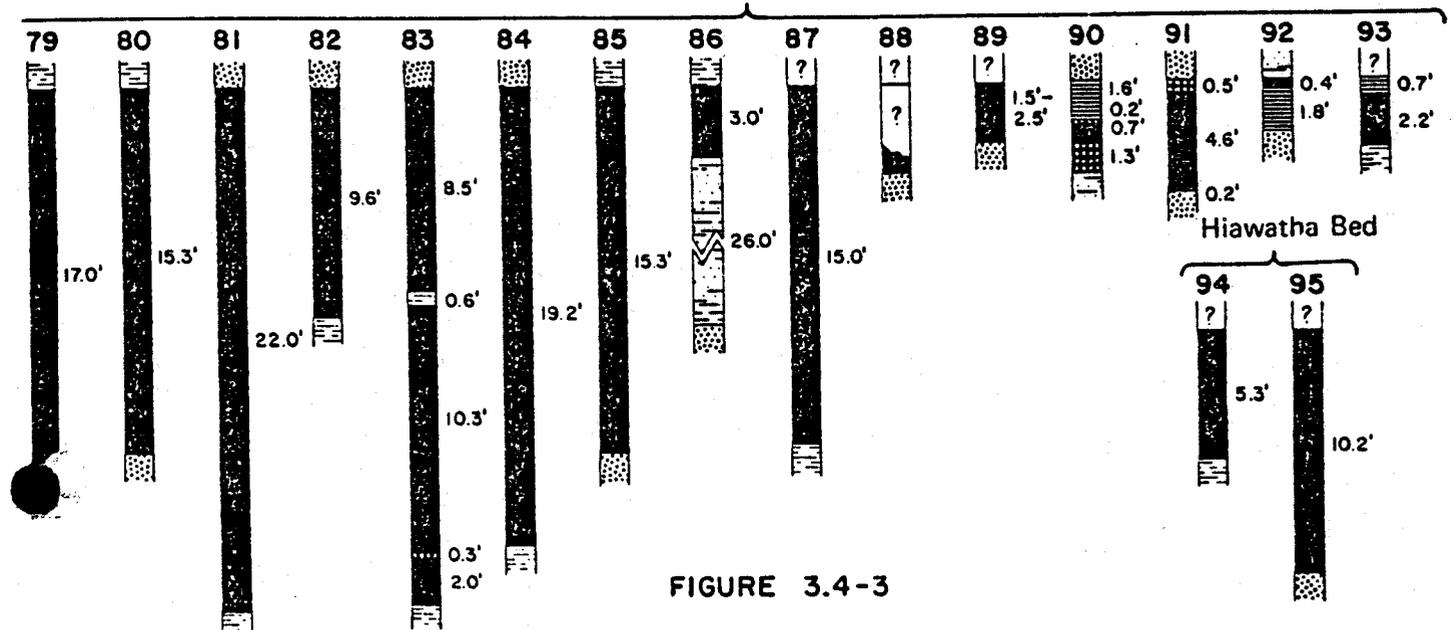


FIGURE 3.4-3

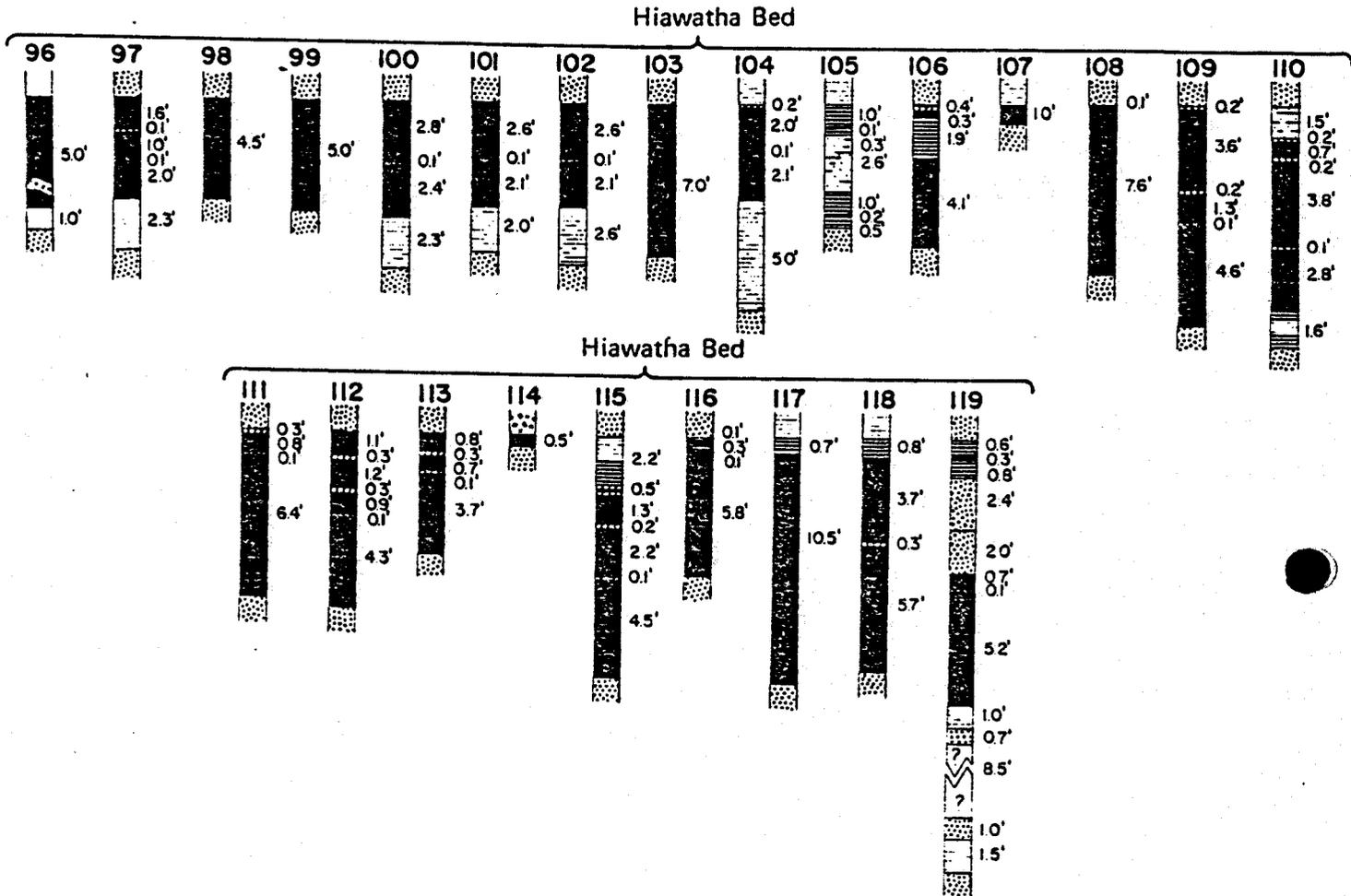


FIGURE 3.4-4

3.4.3.2.2 RECOVERY RATE

Mining recovery of the above reserves is projected to be 50% of the total inplace raw coal tonnage.

The operation will produce 300,000 tons of raw coal per year with at least 3 miner sections working 240 days. This is 1250 tons per day with 2 production shifts operating.

The rate of production (considering a lower rate during the initial buildup years plus the tonnage still to be mined in the area of old workings) will make the projected mine life 50 years.

3.4.3.2.3 JUSTIFICATION AND MINING ENGINEERING TECHNIQUES

Mining techniques and operating procedures adopted by Co-op for this property are based upon current engineering principles and modern equipment in relation to existing knowledge of the property, natural conditions and production desired. Approaches are not those of the Co-op staff alone; they are the result of consulting with reputable consulting mining engineers of this country as well, all of whom are familiar with western U.S. coal conditions.

Mine layout has considered the seam condition and minable areas so that all recoverable coal can be reached. Main entries are designed for maximum protection throughout their life with adequate capacity to supply ventilating air to working areas as well as trouble free haulage systems for coal, men and material.

3.4.3.2.4 JUSTIFICATION FOR NON-RE-COVERY

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RCS

Mining techniques and operating procedures adopted by Co-Op for this property are based upon current engineering principles and modern equipment in relation to existing knowledge of the property, natural conditions and production desired. Approaches are not those of the Co-Op staff alone; they are the result of consulting with reputable consulting mining engineers of this country as well, all of whom are familiar with western U.S. coal conditions.

Mine layout has considered the seam condition and mineable areas so that all recoverable coal can be reached. Main entries are designed for maximum protection throughout their life with adequate capacity to supply ventilating air to working areas as well as trouble free haulage systems for coal, men and material.

3.4.3.2.4 JUSTIFICATION FOR NON-RECOVERY

See Section 3.4.3.2.1.1 for discussion of rider seams and justification for non-recovery.

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Only that coal required by law to be left in place and that which is economically or physically unrecoverable because of adverse natural conditions or safety considerations will not be recovered.

Mine layout assures that all areas of coal within the permit boundaries are accessible to mining.

Even in the suspected area of faulting, plans have been made to locate panels between and parallel to the faults for maximum recovery.

3.4.3.2.5 Access to Future Reserves

Not Applicable

3.4.4 Economic Validity of Operation

Economic information provided in this application is in compliance with OSM and DOGM regulations 782.16 (b) AND (784.13(b)(6)). Reclamation costs are discussed in Section 3.6.7.

3.4.5 Equipment Selection

Co-op Mining Company will utilize the equipment described in the following list for its mining operation and will acquire any additional equipment as required to maintain a sound mining operation.

3.4.5.1 Surface Equipment

Vibrating screens
crushers
conveyors
Front end loaders
road grader
crawler tractor
fork lift

3.4.5.2 Underground Equipment

continuous miner
electric shuttle cars
belt line with feeder-breaker
roof bolter
scoop
service vehicle
personel carrier
boss buggy
rock dusters
water pumps
supply tractor
stopper
power center

3.4.6 Mine Safety, Fire Protection and Security

The mine complies with all federal, state and local

regulations on safety, fire control and security in underground and surface areas, as discussed below.

3.4.6.1 Signs

Signs used on the property are constructed of suitable material, employ uniform and standard designs and conform to local ordinances and codes. They will be maintained during the conduct of all activities to which they pertain. The gate at the main entrance will be posted with a sign containing the company name, address, telephone number and identification number. Table 3.4.6.1 lists signs and duration of maintenance and placement. Surface blasting is not planned at this underground mine. If such blasting becomes necessary for some reason, "Blasting Area" signs will be posted on access roads and on public roads within 200 feet. In addition, the blasting area will be conspicuously flagged in the vicinity of charged holes. All other requirements of the Utah DOGM mining regulation pertaining to surface blasting will also be satisfied.

In the event that surface blasting becomes

Table 3.4.6.1

Sign Maintenance

Stream Buffer Zone Signs	Until Bond Release
*Perimeter Markers	Until Bond Release
Vegetation Reference Area	Until Bond Release
Mine Identification Signs	Until Bond Release
Top Soil Signs	Until soil is redistributed
Blasting & Warning Signs	Until all hazardous activity is concluded
Road & Caution Signs	Until Bond Release
Flammable Materials Signs	Until all such material is removed
Hazardous Material Sign	Until all such material is removed

*Perimeter Markers- The perimeter of the mine disturbance area is marked with steel rods approximately 4' in length (roof bolts) and are painted a fluorescent orange on top. The rods are placed in such a manner that a person can site from one rod to the next and the line can be clearly determined.

necessary the entrance to the property from the public road will be posted with a sign stating, "Warning! Explosives in Use" and explaining the blast warning and all-clear signals and the marking of blast areas.

Tospoil stockpile areas are marked with "Topsoil" signs.

3.4.6.2 FENCES AND GATES

The entrance to the area on the public road will be fenced off with a gate across the road. Because of the rugged terrain, additional fencing is not necessary.

3.4.6.3 HAZARDOUS AND FLAMMABLE MATERIALS CONTINGENCY PLAN

Co-op Mining Company has reviewed the Environmental Protection Agency's list of hazardous material is used under the Resource Conservation and Recovery, Act. It is felt at this

time that the operation does not use or generate hazardous materials. Flammable materials are stored according to State Fire Marshall regulations.

3.4.6.3.1 Acid-Forming

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This mine produces no acid-forming materials. The coal samples in the permit area are representative of all coal material on the property, and are not acid-forming.

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Analyses of roof, floor and coal from the Bear Canyon and Hiawatha Seams are shown in Appendix 6-B of this MRP. Sample locations are shown on Plate 2-2 and 3-4a.

3.4.6.3.2 Toxic Forming

This mine produces no toxic-forming material. However, a small amount of toxic materials are stored on-site. These materials will be in an area bermed and contained. (See Appendix 3- E).

3.4.6.3.3 Flammable (Fire Protection)

The Bear Canyon Mine anticipates no long term storage of coal and thus, the risk of coal storage piles burning is very remote. However, in the event that routine monitoring and inspection reveals ignition to be imminent (hot spots) material in that area will be excavated, removed to a safe place and spread out to stop further heating.

time that the operation does not use or generate hazardous materials. Flammable materials are stored according to State Fire Marshall regulations.

3.4.6.3.1 Acid-Forming

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Combustible non-coal materials such as paper, used oil and wood will be collected routinely, transported to an approved sanitary land fill and disposed of.

Diesel fuel and gasoline are stored in tanks with capacities of 1,000 and 5,000 gallons. The tanks are located and positioned so as not to affect any slope or shaft opening. The storage tanks will be protected from corrosion by cathodic coat protection or other effective methods considered most compatible with existing soil conditions. The tanks will be inspected to ensure no leakage into the surrounding soil. All surface tanks will have protective berm constructed within 90 days of permit approval; Also, the tanks are located so as any major spillage runs directly to the sediment pond. (See Plate 2-2). Loose coal and the coal faces are sprayed with water prior to and during cutting by the water sprays on the machines. In addition, routine periodic (20-minutes) inspection and tests are made for methane gas during this operation.

Buildings and structures are protected against fire by the location of adequate numbers, sizes and types of fire extinguishers in compliance with regulations. Water is available from the surface water distributing system.

3.4.6.3.3.1 Facilities

Discussed above under Section 3.4.6.3.3

3.4.6.3.3.2 Coal Stockpiles

Monitored daily.

Refuse Piles

Co-Op does not produce processed coal and does not produce coal refuse.

3.4.6.3.4 Explosives

This is an underground mine using continuous mining methods which does not necessitate the need for blasting. In the event blasting would be necessary it would be in accordance with existing federal and state laws.

All surface work, such as site preparation is completed at this time. No surface blasting is anticipated in the permit term.

3.4.6.4 Compliance with Regulations

Co-Op Mining Company will comply with all federal and state regulations pertaining to the operation of this mine within the permit area.

3.4.6.4.1 Routine Reports

All routine reports pertaining to the operation will be submitted to the proper governmental agencies, in particular those required under CFR 30 Chapter 75.1800-1808.

3.4.6.4.2 Reporting of Accidents

All accidents will be reported to MSHA in accordance with CFR 30 Chapter 1 Subpart B par. 80.1080.12; Subpart C par.

80.20-80.24; and Subpart D par. 80.30-80.33. Such reporting will also include the Utah DOGM.

3.4.6.4.3 Corrective Action Accidents

Immediately after an accident, an on-site investigation will be initiated by company safety personnel accompanied by federal and state officials if required. The investigation and report will determine the cause of the accident, contributing factors and methods for prevention. Corrective action will be taken immediately. All data will be reviewed with mine personnel at their regular safety meetings and pertinent data will be incorporated into safety training classes.

Federal, state and other appropriate officials will be notified of all accidents in accordance with current regulations.

3.4.6.4.4 Good Housekeeping

The company believes that neat, clean

working areas are conducive to greater safety, pride and productivity. Its practice will be therefore, to require that supplies and materials be stored neatly in designated areas, that trash be cleaned up daily and transported to control areas for disposal and that spillage of coal or other materials be reduced to a minimum. Inadvertent spillages will be removed as soon as possible.

3.4.6.4.5. Mine Maps

Maps of underground section working will be updated by Section Foremen using their own measurements of face advance and width. Sections will be regularly and accurately surveyed by the Salaried Personnel and all mine maps will be kept up to date and filed. These records will be reported to the appropriate agencies as required by current regulations.

3.4.6.4.6 Mine Records

Mine operating records will be maintained daily to show progress, production, workforce, conditions, etc. These records will be maintained in the mine files and will be accessible to authorized personnel when necessary.

3.4.7 Operations Schedule

The mine operating schedule as outlined is, of course, subject to change from a variety of causes, i.e., strikes, changes in market, underground mining conditions, surface transportation, etc. However, the following data show the projected performances.

3.4.7.1 Annual Production for Permit Time

If the market conditions warrant, annual production could reach 200,000 tons, and increase to 400,000 tons, (projection) by the year 1995. Prior to the 400,000 ton, an approval from the Executive Secretary in accordance with Sec. 3.1 UAR will be gained.

3.4.7.2 Operating Schedule

The mine will operate 240 days per year, 5 days per week to produce the above ton-

ages. It will use a total of 30 + miners working 3 shifts per day (2 production and 1 maintenance) and producing 400 + ton per shift per unit.

3.4.7.3 EMPLOYMENT

Total personnel will be 35, 5 of whom will be salaried and 30 hourly employees.

3.4.8 MINE PERMIT AREA

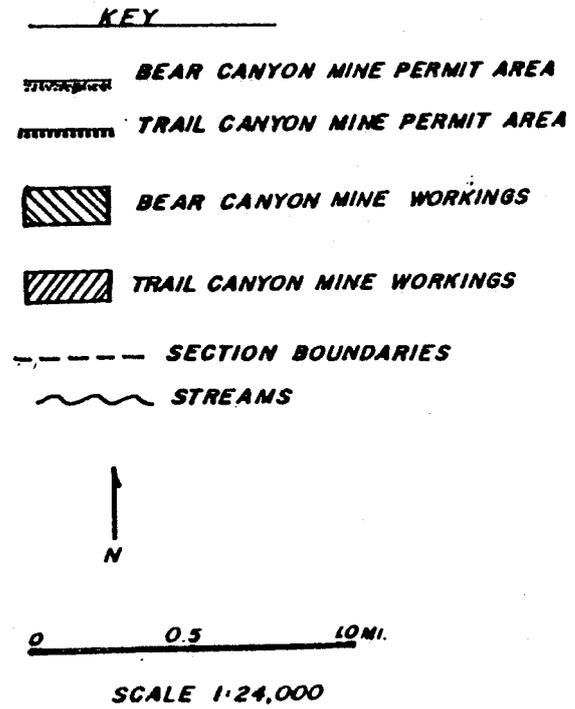
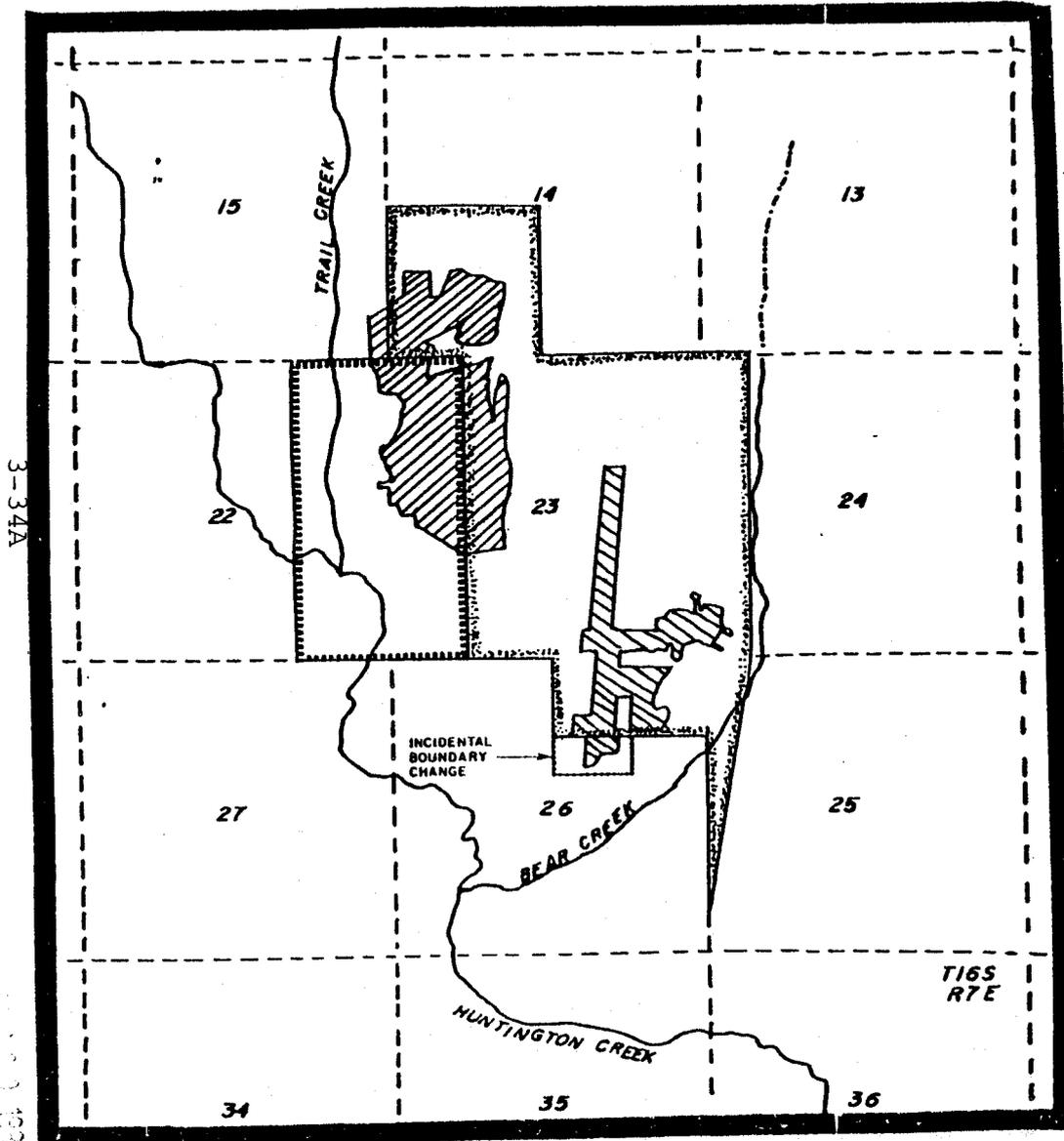
3.4.8 ACREAGE AND DELINEATION

The permit area comprises approximately 900 acres located and outlined as shown on Plate 2-1.

The permit area is made up of properties owned in fee be COP Development Company.

3.4.8.2 MINING SEQUENCES

Plate 3-4 show the mining sequence on the property each year for the first five years and each five years thereafter for the life of the mine.



TRAIL CANYON AND BEAR CANYON MINES:
PERMIT AREAS / MINE WORKINGS

FIGURE 3-4

3.4.8.3 Acreage in Each Scheduled
Sequence of Underground Activity
(Not Surface Disturbance)

<u>YEAR</u>	<u>ACREAGE</u>
1984	<u>11</u>
1985	<u>11</u>
1986	<u>11</u>
1987	<u>11</u>
1988	<u>13</u>
1989-1993	<u>65</u>
1994-1998	<u>65</u>
1999-2003	<u>65</u>

3.4.9 Mine Plan Area

The "mine plan area" is defined for the purposes of this section to consist of the permit area.

The permit area has been discussed previously (Section 3.4.8).

The tentative acreages to be disturbed for each activity described above are as follows:

Mine Shop Area	.75 acres
Mine Access Road	2.15 acres
Portal and Pad Areas	5.1 acres
Sediment Treatment Area	.5 acres
Scale Area	1.42

3.5 ENVIRONMENTAL PROTECTION

COP Development Company, which is the legal owner of affected surface operations, anticipates that the postmining land uses of the affected areas will remain the same as the premining land uses. These uses are identified in Chapter 4. State or local governments have not proposed any changes in land use following reclamation.

Once operations in an area have ceased, the disturbed area will be scarified, sloped and seeded before the next growing season. The site will be reseeded with a mixture of seed such as mountain varieties of wheatgrass, hard fescue, or species

specified by the Division of Oil, Gas, and Mining. Grass will be maintained by fertilization or reseeding until stable up to five years. (See Interim Reclamation Plans - Appendix 3-C, and Final Reclamation Plan Sec. 9.5). Co-op is committed to total Reclamation of all disturbed areas.

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

Co-op Coal Company will cooperate with all state and local land use plans and programs.

Emery County zoning ordinances classify the Bear Canyon Mine plan area as Industrial Mining.

3.5.1.1 PROJECTED IMPACTS OF MINING ON
CURRENT AND FUTURE LAND USE

The management objectives and the impacts from the Bear Canyon Mine pertaining to

these objectives are described in detail
in Chapter 4.

IMPACTS

Approximately 10 acres of soil will be disturbed within the permit area. This includes loadout areas, offices, shops and substations, roads, portal areas and the topsoil storage area.

The reduction in desirable plant species will temporarily reduce forage production and wildlife capacities.

The short-term negative impact of vegetation removal would be outweighed by the positive impacts of revegetation and improved fire protection and prevention.

Wildlife in the area will adapt to the operation in a relative short time as witnessed by existing coal operations. Proposed construction may temporarily disrupt wildlife if human disturbance is not kept to a minimum. These

topics are discussed in detail in the Wildlife Report, Chapter 10.

3.5.1.2 Control Measures to Mitigate Impacts

Reclamation activities in the permit area will be directed toward minimizing the overall impact of coal mining. This can be accomplished by careful planning of the disturbed areas that must be later reclaimed.

The mine surface operation facilities proposed, will be returned to a wildlife/grazing habitat at the conclusion of the mining operation. The premining and proposed postmining uses are therefore identical for all areas. (Chapter 4)

The initial step in the reclamation plan is to seal all large diameter openings. This will be accomplished by backfilling these openings with non-combustible material. The seals will be designed so 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. Next, all solid waste generated in abandonment operation will be collected and removed from the reclaiming areas. Additional information concerning this aspect of the reclamation plan is presented 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 backfilling is completed, drainages will be returned and disturbed areas will be graded and recontoured. A detailed description of this reclamation phase is

found in Section 3.6.4, Backfilling and Grading Plans.

A suitably permanent and diverse vegetative cover, as required by the appropriate land management agency, will be established on all affected land. (See Sec. 9.5 and 10.5 for details).

Land reclamation will take place as soon as possible after surface disturbance.

All cut and fill slopes resulting from construction of the access road will be stabilized and revegetated at the first seasonal opportunity. Areas occupied by support facilities such as roads, office buildings, shops and coal handling structures will not be reclaimed until conclusion of the mining operation.

3.5.2 Protection of Human Values

There are no public parks nor historical sites worthy of preservation in the permit area.

3.5.2.1 Projected Impact of Mining on Human Values, Historical and Cultural

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The projected impact of mining on cultural resources can be direct or indirect. Direct impacts are a direct consequence of project development and operation, such as earthmoving. Indirect impacts arise from activities that are not strictly part of the project development and operation, such as changes in local population.

3.5.2.2 Control Measures to Mitigate Impacts

Co-Op is committed to take all necessary steps to remedy any adverse impacts from slides and to notify the Division by the fastest available means to safeguard human and environmental values.

3.5.3 Protection of Hydrologic Balance

Co-op Mining Company will conduct all mine site operations in such a way as to minimize potential impact to surface and ground water quality.

Water originating in or flowing through disturbed areas will be collected by a drainage control system and the additional suspended material allowed to settle in a sediment treatment facility before discharge into the natural

drainage system. No permanent changes to the natural drainage channels are anticipated. Postmining land use will be similar to premining use, and the hydrological aspects of the reclamation effort have been planned accordingly.

Present mine portals are designed to ensure that water will not be discharged from the mine, once the water right issue is resolved and the present discharge will be utilized.

In compliance with 30 CFR 75.1711-2, 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.

Culinary water usage at the mine site will qualify as a public water supply and will meet State of Utah primary and secondary water standards.

3.5.3.1 Projected Impacts of Mining on
the Ground Water Hydrologic
Balance

Geology largely controls the occurrence and quality of water in any region. Since the region surrounding the mine plan area consists of the same geologic formation, the effects of mining on hydrologic balance should be the same throughout the area. Further, it can be assumed that the impacts from future mining will be the same as the minor impacts that have resulted from the mining of the past 50 years.

The existing hydrologic balance will be discussed in detail in Chapter 7, Hydrology.

3.5.3.2 Control Measures to Mitigate Impacts

No significant impacts to the ground water system are expected from the mining operation. The ground water monitoring plan, discussed in Section 3.5.3.3, will provide

a means to follow the possible effect of the mining activities on the ground water system. No surface or ground water will be discharge into the mine under any circumstances. If mine water is encountered at the working face, which on an areawide basis generally yields less than 10 gal./min. per active face, it will be collected in the face area and pumped to impoundments located within the mine. The impoundments will be designed to allow sufficient time for suspended solids to settle. If necessary, mechanical devices will be installed to remove grease and oil that might be present in the water before it is used for dust suppression.

The construction of proposed surface facilities will result in increases of the suspended solids concentration increases, however are expected to be temporary because of compliance with the regulatory requirements that sediment control features be provided for all areas of surface disturbance.

Water quantity will remain generally unaffected due to the geological conditions in the mine area. Therefore, there will be little or no impact, adverse or otherwise, on the hydrologic system.

State and federal regulations (30 CFR 817.54 and UMC 817.54) require that an alternate water supply be provided to replace any water supplies in the area, Co-op Mining Company will provide this alternate supply if needed. Several alternate sources of supply exist:

- 1) Water from springs could be piped to the affected site.
- 2) Water rights could be purchased for springs damaged by Co-op Mining Company, or, alternate water shares could be substituted. (See App. 3.3.6., Proof of Ownership).
- 3) A well could be drilled at the affected site to provide an alternate supply (since artesian conditions do not exist).

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- 4) Water produced in the mine could be piped to the affected site.
- 5) Water shares presently owned could be transferred.

Alternative 4 may mean treating of poorer quality water and pumping to overcome elevation differences.

In the unlikely event that mining adversely affects a water source, the Co-op Mining Company will select an alternative after considering all possibilities of each site-specific circumstance.

3.5.3.3 Ground Water Monitoring Plan

An ongoing ground water monitoring program will be conducted.

3.5.3.4 Projected Impacts of Mining on the Surface Water Hydrologic Balance

The occurrence and quality of water in any region is highly controlled by geology. The majority of the mine plan area is strong structurally and consists of the same geologic formations. It is presumed that mining activities will have little adverse impact on the area hydrologic system.

3.5.3.5 Control Measures to Mitigate
Impacts - Surface Water

Runoff from all disturbed areas will be passed through sediment treatment facilities. Any discharge from facilities will be monitored in accordance with NPDES permit standards and state and federal regulations.

The effects of the mining operation on the surface water system will be analyzed through the surface water monitoring plan described in the next section. In the unlikely event that monitoring shows that the surface water system is being adversely

TABLE 3-6

Parameters Included in Surface Weater and
Groundwater Monthly Monitoring Plan

1. Flow (gpm)
2. pH
3. Temperature (C^o)
4. Total Dissolved Solids (mg/1)
5. Dissolved Calcium (mg/1)
6. Dissolved Iron (mg/1)
7. Dissolved Magnesium (mg/1)
8. Dissolved Potassium (mg/1)
9. Dissolved Sodium (mg/1)
10. Dissolved Bicarbonate (mg/1)
11. Dissolved Carbonate (mg/1)
12. Dissolved Chloride (mg/1)
13. Dissolved Nitrate (mg/1)
14. Dissolved Sulfate (mg/1)
15. Total Suspended Solids (mg/1)

Note: See Figure 7-4 for reporting format.
These parameters will be expanded to
comply with new DQGM guidelines upon
their adoption by the agencies.

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.

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

UMC 817.21-25

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 operation are concluded in each disturbed area, the removed topsoil will be redistributed on the site in a 6" uniform lift. 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.

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

PHYSICAL AND CHEMICAL SOIL STABILIZATION

Soils will be stabilized by physical and chemical methods before planting. This will 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 will 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 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 plan.

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 underground mine, the overall impact on surface vegetation is minor. The effects of surface opera-

tions on 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 (817.111)

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 postmine 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 replanting. These will be potted seedlings, if available. Bare-root trees will be used to some extent. Seedling will be planted during the months of April-May when possible - however, depending on availability fall planting would occur September - October.

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 and are detailed in the specific reclamation plan chapter 9.

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 2 years after revegetation. Problem areas will be corrected and a monitoring schedule adhered to as defined in 3.6.6.2. Any maintenance indicated by the

results of these inspections will be carried out promptly.

Vegetation will be measured yearly on all revegetated plots for the first 2 years. If success is achieved, further measurements will be made at 2-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-

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 impact. Disturbance to vegetation resulting in several 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 high quality streams in the surface operation areas, little impact to aquatic wildlife is expected. Huntington Creek, the closest high quality 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

Maximum effort will be made to minimize habitat disturbance and loss, surface activity will be minimal. 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 the disturbed area and will be small. All water in the permit area is perennial, but of poor quality. Any water sources necessary to wildlife will be provided. In addition, riparian habitat will be enhanced.

(See Section 10-D) Structures that pose a barrier or hazard will be provided with passageways, buffers, fences, or other necessary protection, as directed by UDWR. Co-op is committed to reclaim all disturbed land and remove all support facilities upon completion of mining to prevent damage to fish, wildlife, and related environmental values.

The applicant will inform employees of the vulnerability of local wildlife and will admonish them to avoid all harrassment 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. Co-op will also report the presence of all Golden Eagles on the permit area as well as any other T&E species.

Since no impacts are expected to surface 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/m³, which is less than the NAAQS of 60 Hg/m³. 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 than 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

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 minedout 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

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. An annual field survey will be made to identify observable subsidence. Details are attached under Appendix 3-5-8A.

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 could be developed if the need were to become critical in the effort to maximize coal removal. Co-op would then submit plans for a disposal site for underground-waste at least 90 days prior to anticipated need and will not use the site until such area is approved

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 was generated and submitted to the Division for their review prior to implementation. It is discussed in Appendix 3.3.4.A Sec. 8.



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In the interim, the equipment which is not scrapped out will be temporarily stored on the disturbed site in Bear Canyon. This site is situated in such a manner to insure that whatever runoff results from the area will pass through designated sediment facilities. The noncoal 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. Appendix I addresses a comprehensive plan to handle toxic or contaminated material in the course of reclamation.

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 will 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. (See List Attached under Appendix 3-C).

Proposed access roads, to the mine portals, will be reclaimed and revegetated. This will accomplish a dual purpose of controlling runoff and revegetating the hill-sides 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, (earth & small rock) adjacent to the portals. The seals will be designed such that mine drainage, if any, will not enter surface water bodies.

8/23/85

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 vegetation cover to 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 coal yards 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 site in Bear Canyon. The balance of 5,500 cu yds. has been purchased from RACO Company and was tested to insure its compatibility. Sec. 8.6. (See Appendix 3-D).

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 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 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.

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.

TOPSOIL PROTECTION

The short-term topsoil stockpile will be sprayed with water or temporary 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 tacking 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 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.

TOPSOIL REDISTRIBUTION

Prior to topsoil redistribution, regraded land will be scarified by a ripper-equipped tractor. The ground surface will be ripped to a depth of 14" in order to reduce surface compaction, provide a

roughened surface to assure topsoil adherence and promote root penetration.

Within a ten day 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 road-bed, mine pads and building sites are to be abandoned.

Topsoil redistribution procedures will ensure approximate uniform thickness of 6" consistent with the proposed reclamation plan. Topsoil will be redistributed within a ten day period prior to seeding and 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 disk running at a 6" 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 measure outlined in Chapter 8, 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 re-vegetation/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. Co-Op is committed to plugging all drill holes with 5 feet of cement as required by rule M3(5) UMLR Act of 1975.

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 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 lfb/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 recess will be made 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 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 seeded. 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 Section 3.6.9.1.

3.6.3.2 Removal of Surface Structures

Co-Op Mining Company will restore disturbed land-surface areas to their approximate premining conditions, to the extent technologically and economically feasible. All surface facilities including support facilities will be removed and restored to prevent damage to fish, wildlife, and associated environmental values.

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

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

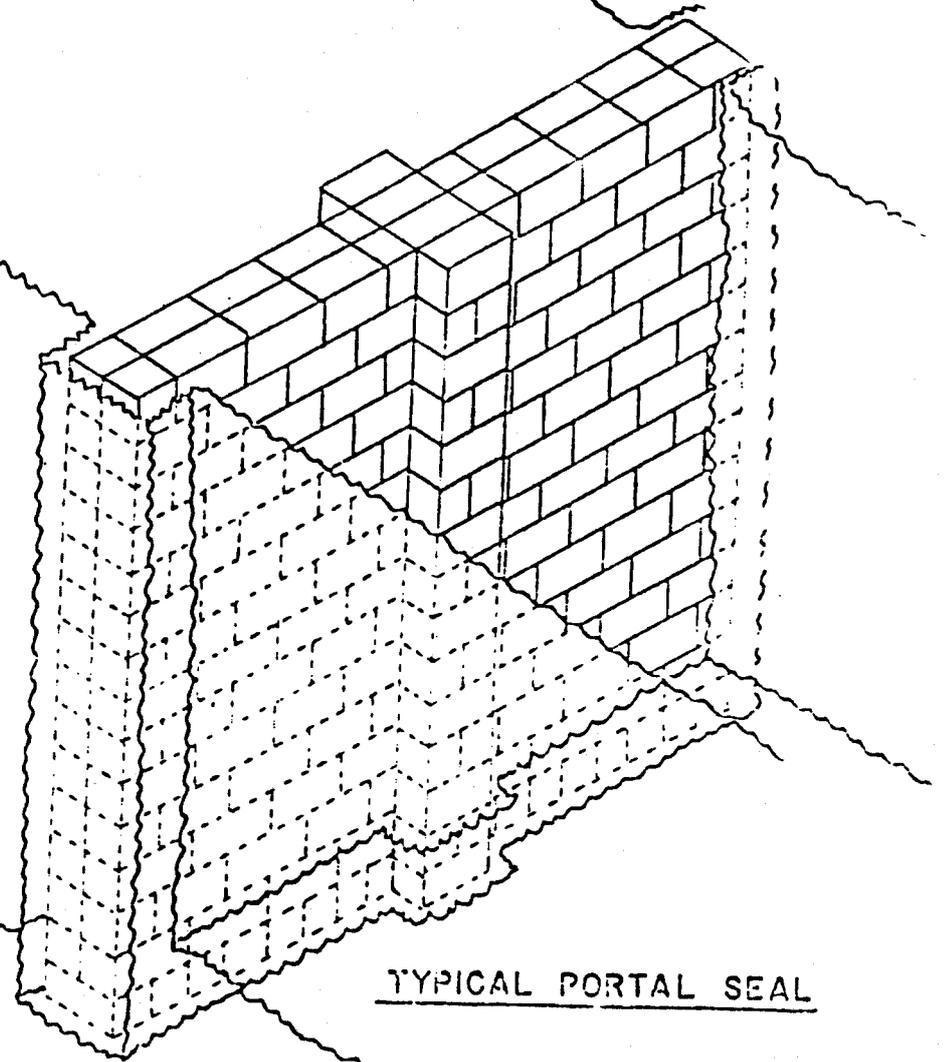
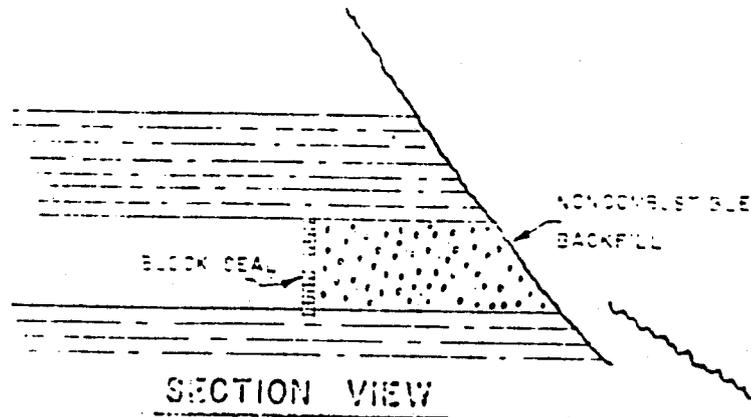
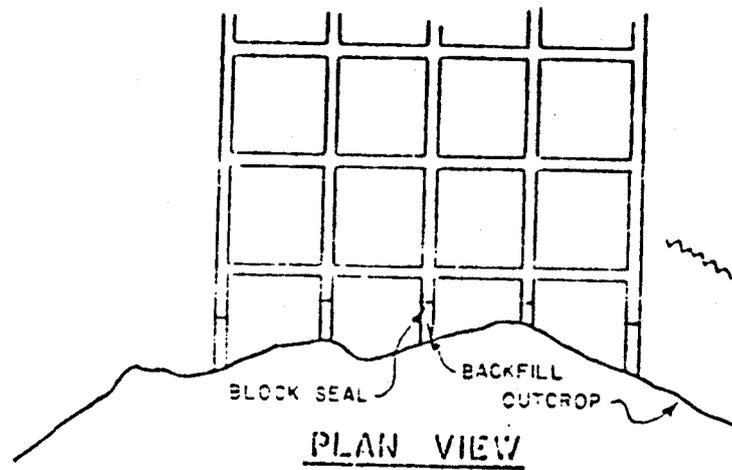
3.6.3.3 DISPOSITION OF DAMS, PONDS AND DIVERSIONS

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 backfilled and revegetated.

Natural drainage pattern 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, conouring and grading process is to achive a reclaimed surface which ~~all~~ will



PORTAL SEALS

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. Stability analyses of backfilled areas are discussed in Appendix 3- F.

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.

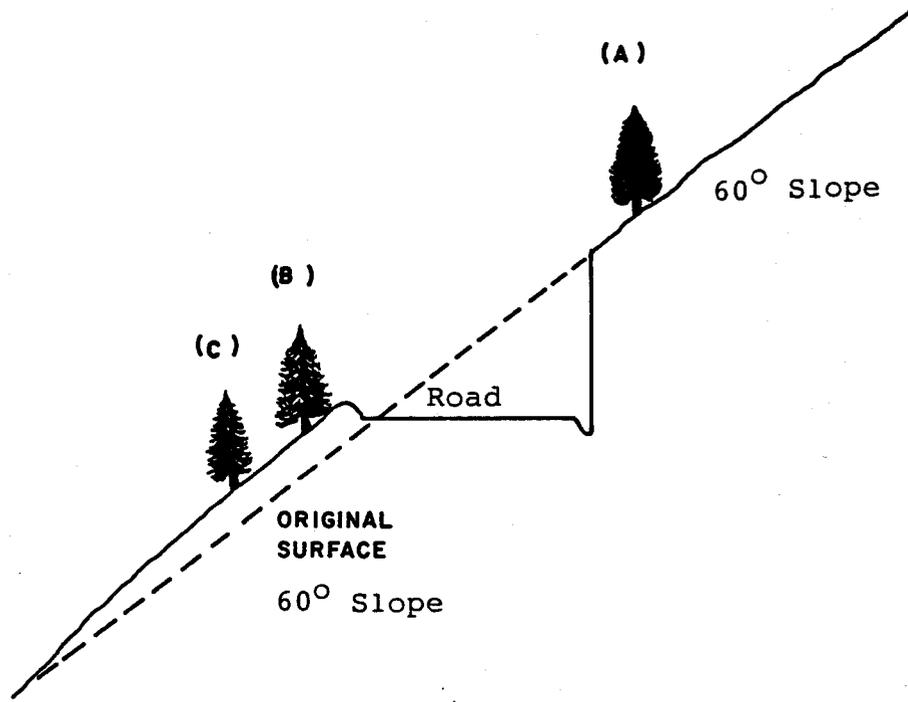
In general, the backfilling and grading operation will take place in the following manner:

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.

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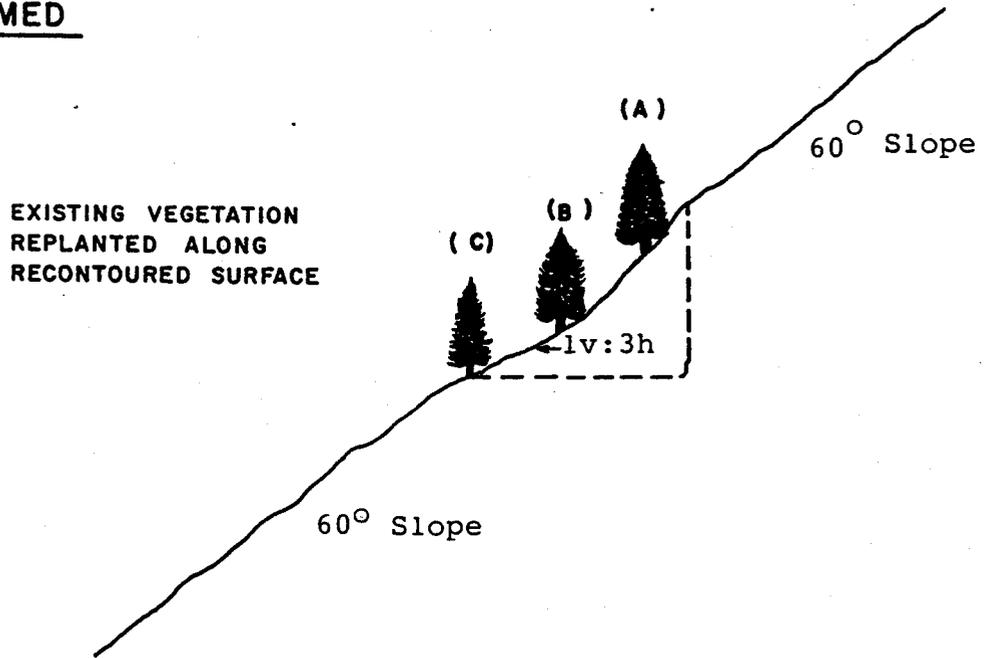
3. A backhoe and dozer will work in conjunction to remove the outer edge of the operational benches and compact it against the highwall. This will be accomplished by the backhoe reaching over the edge of the bank approximately 20' pulling the material back. The dozer will then push and compact this material from the highwall outward to reach a bench slope of approximately 1v:3h 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 14" with a dozer where possible. Steep slopes will receive ripping to create ledges, crevices, pockets and screes. These areas are shown on the Post mining Topography Plate 3-2 as cat track terraces. This will reduce compaction and prevent topsoil slippage, and improve soil retention and vegetation establishment in the cat tracks. The area will be walked over to create grouser marks which run parallel to the slope.

EXISTING



Scale: 1"=20'

RECLAIMED



Scale: 1"=20'

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 a 3:1 safety factor & 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 backhoe, approximately 20'. Steep slopes and highwalls are inaccessible to conventional equipment, and thus, cannot be reduced or flattened appreciably during reclamation. Stability analysis on these areas have confirmed that they have a factor of safety greater than 1.3 as they presently exist. (Appendix 3-F)

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 Dames & 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 compacted. 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 Dames & 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

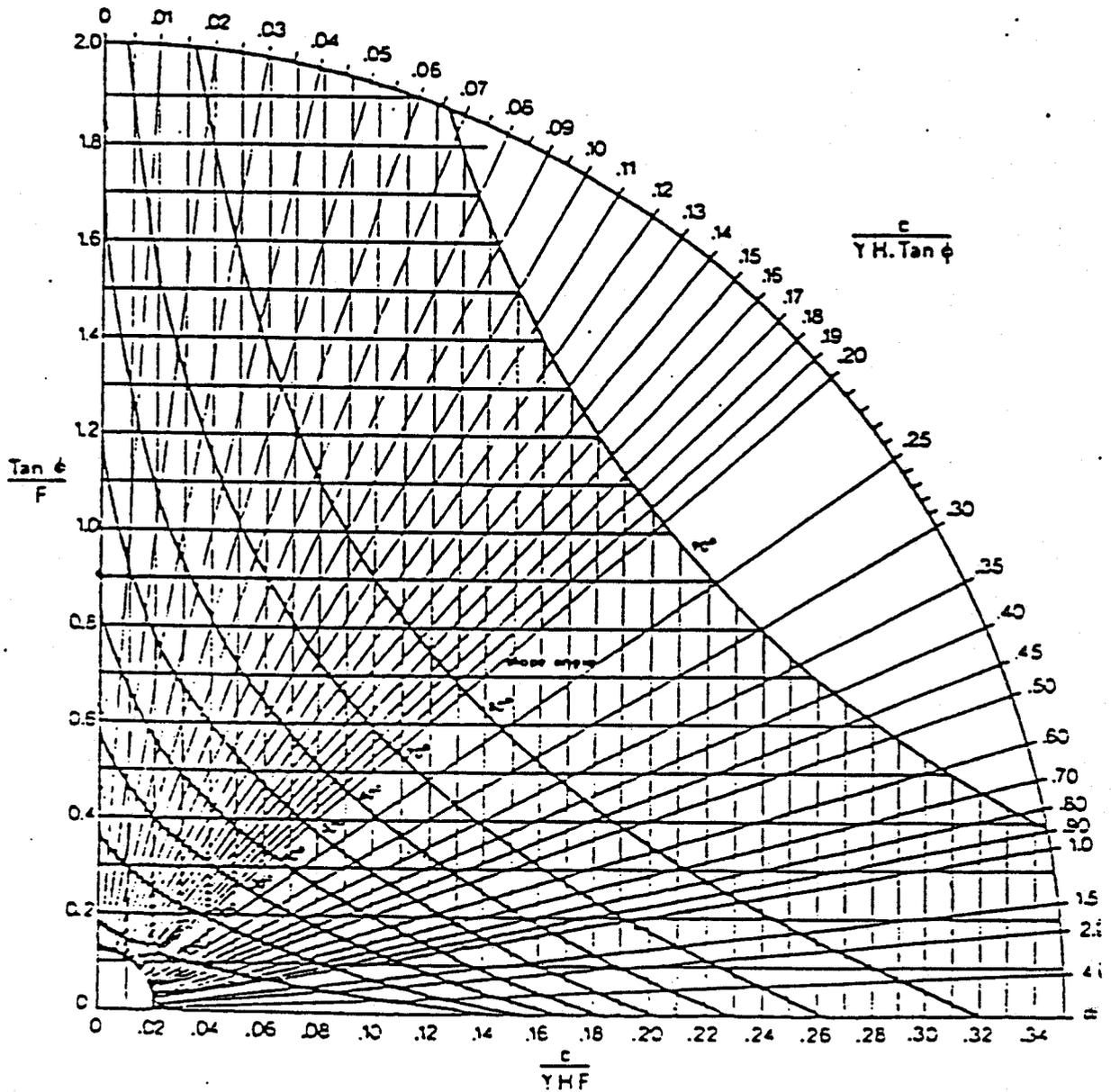
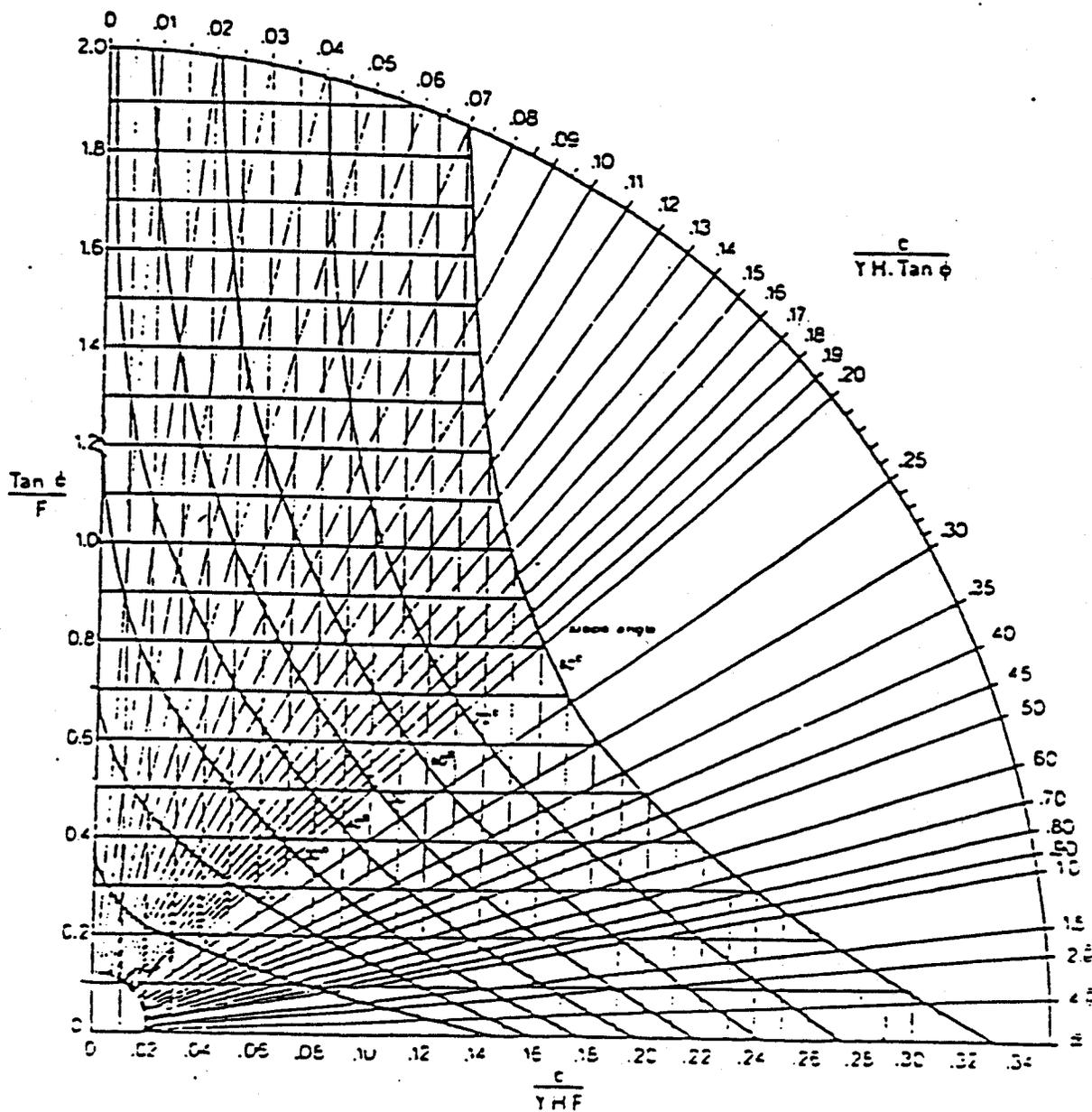


Figure 3.6.4.2.B

(SATURATED CONDITIONS)

CIRCULAR FAILURE CHART NUMBER 5



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 regraded land will be scarified by a ripper-equipped tractor. The ground will be ripped to a depth of 14" to reduce surface compaction, provide a roughened surface to assure topsoil adence and promote vegetational root penetration

Within a 10 days period 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 6" thickness consistent with the proposed reclamation plan. Topsoil will be redistributed in the fall of the year suitable for establishing permanent vegetation.

To minimize compactin of the redistributed topsoil, travel on reclaimed areas will be limited. After topsoil has been applied, surface compaction will be reduced with^d disk to a depth of 6". This operation

8/23/85

help prepare a proper seedbed and protect the re-distributed 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 as outlined in Chapter 8 page 23.

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 are defined in Chapter 8 page 23. An example of the soil stabilization methodology that will be used includes the placement of crushed and heavier material at the toe of roadfill 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, the additional of remedial soil treatments. A 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 screes and are referred to as cat track terraces. This will allow better soil retention and

vegetaion establishment.

3.6.5.1.2 FERTILIZATON 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 analysis will measure the following components:

- o Soil Texture
- o phosphorus
- o Nitrogen
- o Soil pH and salinity

Chemical analyses for micronutrients will be conducted by testing soil extract potassium, calcium and magnesium for atomic absorption analyzer. Ammonium acetate will be used to extact potassium, calcium and magnesium for atomic absorption analysis. Phosphrus will be determined with soduum bicarbonate extraction and colorimteric analysis. The kjeldahl method will be used for determination of total nirogen. Soil texture will be determined by a Bouyoucus hydrometer method (solum herametaphosphate dispersing agent).

Soil pH will be determined on a 1:1 soil/water mixture tested with an electrode pH meter. Salinity will 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 AMONTS/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 diverse 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 was chosen on the basis of premine diversity values (see Section 9.3.6), available seed source and enhancement of postmine land use.

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.

Seedling will be planted in April - May or September - October depending on availability and sequence of completion, plants will be grouped to provide wildlife cover. Spacing within the group is on a 1-m (3.25 foot) Interval and will be correlated to the reference area. Further recommended species and seeding protocol can be found in Appendix 3C.

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 will 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 which temporarily precludes vegetation establishment, a preferred course of action would be to replant problem areas.

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 ON
INTERIM REVEGETATION

All interim 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 not apparent, as represented by achievement of 80% original cover during the 5-year period, monitoring will be immediately investigated to determine the possible failure cause(s), so that positive steps can be taken to establish the desired interim vegetation during the next seasonal opportunity. Planting and/or seeding will be implemented on a contemporaneous basis as soon as backfilling or grading are complete. (see Appendix 3-C Interim plan) This effort will ensure a temporary cover of small grains, grasses or legumes until a permanent cover can be established.

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.
- 2033-2034- 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, and rills and/or gullies develop on reclaimed areas, the damage will be addressed in such a manner to allow re-application of seed and mulch and tack the next available growing season. Earth work will constitute; (1) the diversion of water concentrations away from eroded areas with small hand-made berms, (2) distribution of additional soil if necessary to fill gullies, (3) recontouring with equipment as warranted and, (4) re-application of seed, tack, mulch and fertilizer in the approved manner as outlined in Chapter 9.

If gullies constitute an overall change in drainage

pattern, a plan to stabilize and modify drainage pattern will be submitted to the Division for approval prior to implementation.

The monitoring procedures will be the same sampling methodologies which were incorporated in establishment of the reference areas with the exception of productivity. Starting in year 3 after reclamation, years 1 and 2 will be ocular estimates with the intent of identifying problem areas. When plant establishment is obtained the area will be monitored every two years until bond release. Both the final reclaimed area and reference area will be sampled for cover, density (woody plants), Species composition productivity will be determined using the Harvest method after reclamation appears successful.

The success of the reclamation effort will be evaluated by detailed sampling of cover, woody plant density production on reference and 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 woody plant density 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 standards will be sampled for each reference area as well as the reclaimed areas and the success of the reclaimed area based on the results from the reference areas (app. 400 plants/ha survival at bond release) cover, woody plant density 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 Harvest 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

Co-Up Mining Company
 Bear Canyon Mine
 ACT/015/025, Emery County

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3.6.7.1

Detailed Timetable for Completion of Major Reclamation Processes
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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 - 2 weeks	3 weeks
3. Soil Placement (backfilling and grading)	
A. Upper Pad - 1 week (including road)	4 weeks
B. Channel Restoration - 1 week	5 weeks
C. Lower Pad and Diversions - 1 week (including road)	6 weeks
4. Seedbed Material and Handling - 1 week	7 weeks
5. Reseeding and Fertilizing - 1 week	8 weeks
6. Mulching - .5 week	8.5 weeks
7. Protective Fencing - 2 weeks	
(concurrently)	
	<u>8.5 weeks</u>

The above reclamation tasks are, therefore, proposed to be completed within 8.5 weeks following the start of reclamation activities.

Labor - Hourly Rates from 1985 Means Site Work Cost Data

- Equipment Operator = \$29.25
- Truck Driver = \$22.90
- Average Helper = \$22.20
- Foreman = \$32.20
- Crane Operator = \$29.90
- Welder - \$33.50

Equipment - Hourly Rates from 1985 Means Site Work Cost Data

	<u>Cost Per Hour</u>
1. Loader - 950E (2-1/2 cy bucket) - \$100 + \$17.65 Operator	\$117.65 29.25 <u>\$146.90</u>
2. Crane - Groves RT-580 20T - \$69.75 = \$12.35 Operator	\$ 82.10 29.90 <u>\$112.00</u>
3. Truck and Operator	\$ 65.15
4. Cat D-7G - \$137.50 + \$20.35 Operator	\$157.85 29.25 <u>\$187.10</u>
Ripper (three shanks = \$24.90 + 2.25 oper/hr)	\$ 27.15
5. Backhoe (Cat 235) - \$185.00 + \$26.90 Operator	\$211.90 29.25 <u>\$241.15</u>
6. Acetylene Torch	\$ 6.40
7. Lowboy (truck/trailer) @ \$93.30	\$ 93.30
8. Cat D-3 - \$39.50 + \$5.70 Operator	\$ 45.20 <u>\$ 29.25</u> \$ 74.45

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Backhoe (BH) Cycle Time Estimates - 235 Backhoe (From Cat Performance Handbook)

Average	
Load Bucket	6.5 sec
Swing Bucket	6.0 sec
Dump Bucket	2.5 sec
Swing Empty Bucket	5.0 sec
Total Average	<u>20.0 sec</u> - 2.12 yds ³

Medium to hard digging (hard packed soil with up to 50 percent rock content) depth to 70 percent of machine's capability

3 cy/min x 2.12 yds x 60 = production/hr = 381.60 cu yd/hr or 180 cycles/hr.

J. Retaining Wall Removal	\$	482.00
K. Borehole Plugging	\$	344.00
L. Maintenance and Monitoring of Subsidence, Vegetation and Erosion (10-yr bond liability period)	\$	19,460.00
M. Hydrology Monitoring (10-year bond liability period)	\$	23,166.00
N. Supervision (8-1/2 weeks)	\$	11,050.00
O. Mobilization and Demobilization	\$	2,500.00
		<u>\$179,298.00</u>
	10% Contingency	<u>17,930.00</u>
		\$197,228.00 (1985 dollars)

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- 1986 - \$204,703.00
- 1987 - \$212,461.00
- 1988 - \$220,513.00
- 1989 - \$228,871.00
- 1990 - \$237,545.00

Note: Section 3.6.7.2 (page 3-116)
Modification cost adjustment

Reclamation Costs

A. Seal and Backfill Portals	\$	10,500.00
AMR Costs - \$3,500/seal including backfill x 3 seals	\$	10,500.00
B. Removal Structures		
<u>Fan</u>		
Labor - 2 men. x \$179.20/day x 2 days	\$	717.00
Equipment (hauling) - truck + operator x 4 hrs X \$85.15/hr		340.60
20 T crane x 2 hrs x \$112.00/hr		224.00
		<u>\$1,281.60</u>
	SUBTOTAL	

Structures and Conveyor (principle)

Labor - 3 men x \$179.20/day x 2 days \$1,075.20
Equipment (hauling) - 1 truck + operator
x 16 hrs x \$85.15/hr 1,362.40
1 loader + operator x 16 hrs x \$146.90/hr (950B - 2-1/2 cu yd bucket) 2,350.40
Crane - 2 hrs @ \$112.00/hr 224.00
DIVISION OF SPECIAL MINING \$5,012.00

Substation Power Transformer

Labor - 2 men x \$179.20/day x 2 days \$ 716.80
Hauling - 1 truck + operator x 16 hrs
x \$85.15 1,362.40
Loader - 4 hrs x \$146.90/hr (+ operator) 587.60
SUBTOTAL \$2,666.80

Scale House Complex Including Bathhouses, Shop, Warehouse,
One Mine Office (same building)

Labor - 2 men x \$179.20/day x 3 days \$1,075.20
Equipment (hauling) - 1 truck + operator x
16 hrs x \$85.15/hr 1,362.40
Loader - 8 hrs x \$146.90/hr + operator 1,175.20
SUBTOTAL \$3,612.80

Water System (10,000 gal & 12,000 gal tanks)

Labor - 2 men X \$179.20/day X 1 day \$ 358.40
Hauling - 1 truck + operator x 4 hrs x
\$85.15/hr 340.60
Loader - 2 hrs x \$146.90/hr + operator 293.80
Acetylene Torch - 4 hrs @ \$6.40/hr 25.60
Welder - 4 hrs @ \$33.50/hr 134.00
SUBTOTAL \$1,152.40

Fuel Storage Tank and System

Labor - 2 men x \$179.20/day x 2 days \$ 716.80
Hauling - 1 truck + operator x 16 hrs x
\$85.15/hr 1,362.40
Loader - 8 hrs @ \$146.90/hr + operator 1,175.20
Acetylene Torch - 2 hrs @ \$6.40/hr 12.80
Welder - \$33.50/hr x 2 hrs 67.00
SUBTOTAL \$3,334.20

Truck Loadout

Labor - 48 hrs @ \$29.25/hr	\$1,404.00
Lowboy truck + operator @ \$93.30/hr x 5.5 hrs	513.15
1 580 Crane 2 hrs x \$113.20	226.00
10 yd dump @ hrs @ \$79.30	475.80
Torch - 4 hrs @ \$6.40/hr	26.00
Welder - 4 hrs x \$33.50/hr	134.00
950B Loader @ \$146.90/hr x 4 hrs	587.60
D-7 Crawler Tractor - 4 hrs @ \$187.10/hr	748.40
	<hr/>
SUBTOTAL	\$4,114.95

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Stacking Facility and Coal Bins

Labor - 4 men x \$179.20/day x 1 day	\$ 716.80
Truck and operator \$85.15 x 4 hrs	340.60
1 20 ton Crane 4 hrs x \$112.00	448.00
1 950B Loader \$146.90/hr x 4 hrs	587.60
Acetylene Torch - 2 hrs @ \$6.40/hr	12.80
Welder - 2 hrs @ \$33.50/hr	67.00
	<hr/>
SUBTOTAL	\$2,172.80

Crusher Facility

Labor - 2 men @ \$179.20/day x 4 days	\$1,433.60
1 20 T Crane - 8 hrs X \$112.00/hr	896.00
1 Truck + operator - 8 hrs x \$85.15	681.20
Torch + Welder @ 4 hrs @ \$39.90/hr	159.60
	<hr/>
SUBTOTAL	\$3,170.40

Oil Slack Loadout

Labor - 2 men @ \$179.20/day x 2 days	\$ 716.80
1 20 T Crane - 4 hrs X \$112.00	448.00
1 Truck + operator - 4 hrs x \$85.15	340.60
	<hr/>
SUBTOTAL	\$1,505.40

C. Waste Removal

Labor - 2 men x \$179.20/day x 4 days	\$1,434.00
Hauling - 1 truck + operator x 8 hrs x \$85.15/hr	681.20
Loader (+ operator) - 4 hrs x \$146.90	587.60
	<hr/>
SUBTOTAL	\$2,702.80

D. Soil Placement and Seedbed Material & Handling

SUBTOTAL \$38,954.01

E. Channel Restoration (pulling culverts, reshaping channel, riprap and gabion structures)

Backhoe + operator x \$241.80 x 48 hrs	\$11,575.00
Labor - 4 men x \$179.20/day x 4 days	2,867.00
Cat x 1 day @ \$187.10/hr	1,496.80
Gabion Structures @ \$63.00/sy (53.3 sy)	3,356.00
Miscellaneous Riprap - \$500.00	500.00
	<u>\$19,796.80</u>

SUBTOTAL

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F. Reseeding and Fertilization (5 ac)

Hydroseeding, operator and driver (from page 9-25 of the MRP)

Seeding = 853/ac x 20% reseeding rate	\$5,118.00
Shrubs (1,752/ac x 2 ac) @ \$.63/plant	2,207.52
\$93.00/ac x 2 ac (labor)	\$ 186.00

SUBTOTAL

\$7,511.52

G. Mulching (5 ac) (from page 9-25)

Hydromulcher, operator and driver

\$843/ac x 5 ac x 20% reseeding rate	\$8,092.80
Straw bales for sediment control	500.00
Mobilization of hydromulcher	500.00
	<u>\$9,092.80</u>

H. Protected Fencing (10 ac)

6 ft high x 3,000 linear ft x \$2.00/ft installed

SUBTOTAL

\$6,000.00
\$6,000.00

I. Baseball Park Seeding

3 ac orill seeding @ \$240.00/ac
600 lbs seed @ \$3.00/lb

SUBTOTAL

\$ 720.00
1,800.00
\$2,520.00

J. Retaining Wall Remov. 1

2 hrs backhoe @ \$241.15

SUBTOTAL

\$482.30
\$482.30

K. Borehole Plugging

5 yds cement @ \$51.00/yd
4 hrs labor @ \$22.20/hr

SUBTOTAL

\$255.00
88.80
\$343.80

L. Maintenance and/or Monitoring for Subsidence, Vegetation and Erosion (bond for 10-year bond liability period)

Vegetation - 1 person (truck, expenses) - 3 days	\$ 500.00/yr
Erosion - D- for 1 day @ \$74.45/hr	595.60/yr
1 day to field check erosion - 8 hrs @ \$25/hr	200.00/yr
<u>Subsidence</u>	
2 day field survey @ \$200/day	
1 day certified surveyor @ \$250/day	650.00/yr
SUBTOTAL	<u>\$1,946.00/yr</u>
10 yrs x \$1,946.00 = \$19,460.00	

M. Hydrology Monitoring, Quarterly

Labor - 4 days annually @ \$179.20/day	\$ 716.80
Laboratory work - \$400.00/quarter x 4	1,600.00
SUBTOTAL	<u>\$2,316.80/yr</u>
10 yrs X \$2,316.80 = \$23,168.00	

N. Supervision - 8-1/2 weeks @ \$1,288/week	\$11,050.00
SUBTOTAL	<u>\$11,050.00</u>

O. Mobilization and Demobilization of 5 pieces of equipment @ \$500 each	\$2,500.00
SUBTOTAL	<u>\$2,500.00</u>

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SOIL PLACEMENT
(Reference Area Postmining Contour Map)

Areas	Earth Moveo	Cu Yds	Cost/Hr D7G	Cost/Hr BH-235	Time	Cost
Scale Area	Cut	889	\$187.10		13.7 hr	\$ 2,573.00
Sediment Pono B	Fill	450		\$241.15	1.18 hr	\$ 284.37
Sediment Pond A	Fill	1,333		\$241.15	3.49 hr	\$ 841.38
Ditch to Pond A	Fill	377	\$187.10		5.83 hr	\$ 1,091.05
Bathhouse Area	Cut	1,111	\$187.10		17.18 hr	\$ 3,215.28
Loadout	Cut	3,352		\$241.15	8.78 hr	\$ 2,118.27
	Fill	3,352		\$241.15		
Road Coal Preparation	Cut	2,222		\$241.15	5.82 hr	\$ 1,404.18
	Fill	2,222				
Lower Road to Switchback	Cut	3,377		\$241.15	8.85 hr	\$ 2,134.08
	Fill	3,377				
Upper Road to Portal	Cut	6,622		\$241.15	17.35 hr	\$ 4,184.74
	Fill	6,622				
Total	Cut	17,376				\$17,847.36
	Fill	17,333				

SEEDBED MATERIAL AND HANDLING

8,000 cu yds topsoil - transport :65 mi = 950B Loader 41 hrs - \$146.90/hr =	\$ 6,022.90
Dump and regrade - 2 trucks and operator = 41 hrs @ \$85.15/hr	\$ 3,491.15
Spreading and ripping (3 shank ripper) - D7G = 41 hrs @ \$214.25/hr	\$ 8,764.25
	<u>\$18,298.30</u>

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3.6.7.2 Major Modification to Mine the Hiawatha Seam
(Modification of Existing Bond Amount)

**DIVISION OF
OIL, GAS & MINING**

Co-Op Mining will enter the Hiawatha Seam through a portion of old works which were partially covered during road construction to the upper portal. The area in question is presently disturbed and will not constitute an additional area to revegetate, alter natural drainage reconstruction or significantly alter the post-mining contour map in any way.

A new coal receiving bin identical to the existing structure will be constructed as well as approximately 200 additional feet of conveyor; these two structures along with 2 new portals and a small support pad will necessitate the following costs associated with final reclamation:

Hiawatha Seam Revision Costs:

A.	Seal & Backfill Portals	
	AMR Cost - 3,500/seal	
	including backfill X 2 seals =	\$ 7,000.00
B.	Structures and Conveyor (Secondary)	
	Labor - 3 men X \$184.40/day X 2 days	\$ 1,106.40
	Equipment (hauling) 1 truck + operator	
	X 16 hrs X \$90.65/hr	\$ 1,450.40
	1 loader + operator X 16 hrs X \$140.70	
	(950B - 2½ cu. yd. bucket)	\$ 2,251.20
	Crane - 2 hrs. @ \$121.85/hr.	\$ 243.70
	Subtotal	\$ 5,051.70
C.	Hiawatha Receiving Bin	
	Labor - 2 men @ \$184.40/day X 2 days	\$ 737.60
	1 20 T Crane - 4 hrs X \$121.85	487.40
	1 Truck + Operator - 4 hrs X \$90.65	362.60
	Subtotal	\$ 1,587.60

AMENDMENT TO

APPROVED Mining & Reclamation Plan
Approved, Division of Oil, Gas & Mining 3-115

10/3/86

by J. J. H. date 10/14/86

Costs in present bond will change to
1986 costs. The revised bonding costs are:
(Should be added to 1986 Dollars)
Reclamation Costs for Hiawatha Seam
revision (see below)

\$ 204,703.00

\$ 13,639.00

\$ 218,342.00

10%

\$ 21,834.00

\$ 240,176.00 (1986 dollars)

Escalate @ 1.62%

1987 - \$ 244,067

1988 - 248,021

1989 - 252,039

1990 - 256,122

Presently have \$ 237,545 posted in (1990 dollars) (ILOC)
Will add \$ 18,577 more upon approval of surface facilities.

*Pages 3-117 and 3-118 (to be deleted)

AMENDMENT TO
APPROVED Mining & Reclamation Plan
Approved, Division of Oil, Gas & Mining

[Signature] 10/14/86

SOIL PLACEMENT - (Reference Area Post-Mining Contour Map)

Areas	Earth Moved	Cu. Yds.	Cost/Hr.D7G	Cost/Hr.BH-235	Time	Cost
Scale Area	cut	889	182.40		64.65 hr.	2,508.00
Sed. Pond B	fill	450		241.80	1.17 hr.	282.90
Sed. Pond A	fill	1333		241.80	3.49 hr.	843.88
Ditch to Pond A	fill	777	182.40		5.83 hr.	1,063.39
Bath House Area	cut	1111	182.40		17.18 hr.	3,133.39
Load Out	cut	3352		241.80	8.78 hr.	2,123.00
	fill	3352				
Road Coal Prep.	cut	2222		241.80	5.82	1,407.00
	fill	2222				
Lower Rd.to Swith- Back	cut	3377		241.80	8.84	2,137.50
	fill	3377				
Up Rd. to Portal	cut	6622		241.80	17.35	4,195.23
	fill	6622				
Portal Fan Area	cut	4444		241.80	11.64	2,814.55
	fill	4444				
Total	cut	21,820			19 days	20,510.00
	fill	21,777				

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Seedbed Material & Handling:

8,000 cu. yds. topsoil - transport .65 miles = 9503 Loader 41 hrs. 142.45 5,840.00
 dump and regrade - 2 trucks & operator = 41 hrs @ 79.35 3,253.00
 Spreading and ripping - D7G = 41 hrs. @ 182.40 7,478.00

3-116

G. Mulching (10 acres)

Hydromulcher, operator and driver

\$350/acre X 10 acres 3,500.00

Subtotal 3,500.00

H. Protective Fencing (10 acres)

6 foot high X 3,000 linear feet

X 2.00/foot installed 6,000.00

Subtotal 6,000.00

I. Baseball Park Seeding

3 acres drill seeding @ 160.00/acre 480.00

600 lbs. seed @ 3.00/lb. 1,800.00

Subtotal 2,280.00

J. Retaining Wall Removal

2 hours backhoe @ 241.80 483.60

Subtotal 483.60

K. Borehole Plugging

5 yds. cement @ 51.00/yd. 255.00

4 hours labor @ 22.00/hour 88.80

Subtotal \$ 343.80

L. Maintenance and Monitoring Subsidence, Vegetation,
and Erosion

5 years @ \$500.00/year 2,500.00

Subtotal 2,500.00

2. The area receives less than 14" annual precipitation and has no evidence of subterranean irrigation.
3. Water quality of the perennial Bear Creek is marginal and the flows are tied to precipitation event rather than ground water interation.
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 USX.

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 activitie sthat 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.

Each mine entry which is temporarily inactive, but has a further projected useful service under the approved permit application, shall be protected by barricades or other covering devices, fenced, and posted with signs, to prevent access into the entry and to identify the hazardous nature of the opening. These devices shall be periodically inspected and maintained in good operating condition by the person who conducts the underground coal mining activities.

Co-Op is committed to sealing all portals in the prescribed manner which are temporarily inactive in course of normal mining activities.

APPENDIX 3.3.4.A

EXISTING STRUCTURES

4/26/84

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EXISTING AND PROPOSED STRUCTURES

DIVISION OF OIL
GAS & MINING

The Bear Canyon Mine has the following surface facilities:

Temporary Scale House	Fuel Storage Tanks
Truck Loadout	Oil Slack Loadout
Crusher Facility	Shop
Principle Conveyor Structure	Non-Coal Storage Yard
Coal Storage Area & Stacking Facility	Power Transformer
Single Building Complex containing shops, parts warehouse, bathhouse, mine offices and new scale house.	
Mine Run coal Receiver bin, magazines, cullinary water system, and Electric storage shed.	

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 interim approval for each structure in the course of construction, the hydrologic safeguards have been implemented, top soil removed and stored, interim re-vegetation 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.

8/23/85

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 1985. 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-trailor 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

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GAS & MINING

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 segregation 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 No 1-1. 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.

(11) Single Building Complex (New Scale House) Containing small shop, parts warehouse, formans bathhouse, and mine offices.

A schematic of this structure of attached construction, is underway with an anticipated completion date of fall 1986.

(12) Mine run Coal Receiver Bin

As the name implies, is approximately 50' X 100' bin where coal fall from the conveyor chute prior to traveling to the crusher is pictured in photo #7.

8/23/85

Co-Op is committed that all support facilities, mine disturbance or associated disturbance of any kind will be restored so as to prevent damage to fish, wildlife and related environmental values; and, minimize the possibility of additional contributions of suspended solids to streamflow or runoff outside the permit area.

5/10/85

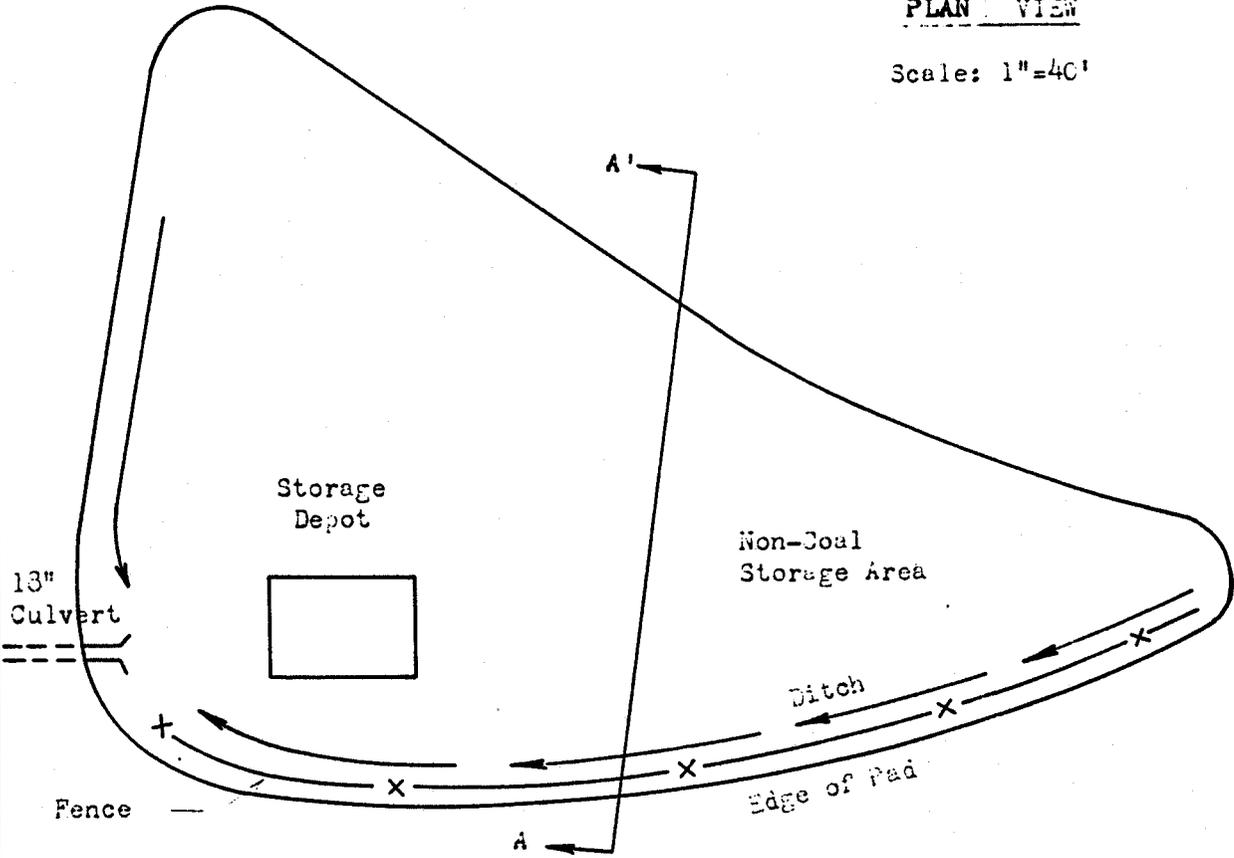
Table 3.3.4.-1

Existing Structure	Construction Dates		Photo #1	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 Stack 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		2033
Fan	9/1982	11/1982		2033
Water Tanks	8/1982	10/1955		2033
Elec. Shed	on site	on site		2033
Bath House	8/1984	11/1985		2033
Stacking Tube & Load-out (2nd Phase)	4/1985	10/1985		2033
Magazines (rental property)	9/1982	contanerized		prior to 1990

8/23/85

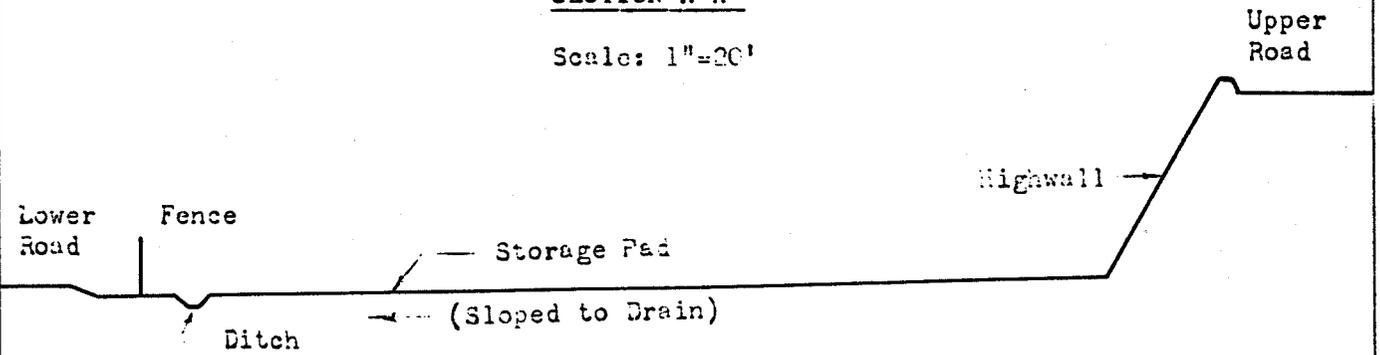
PLAN VIEW

Scale: 1"=40'



SECTION A-A'

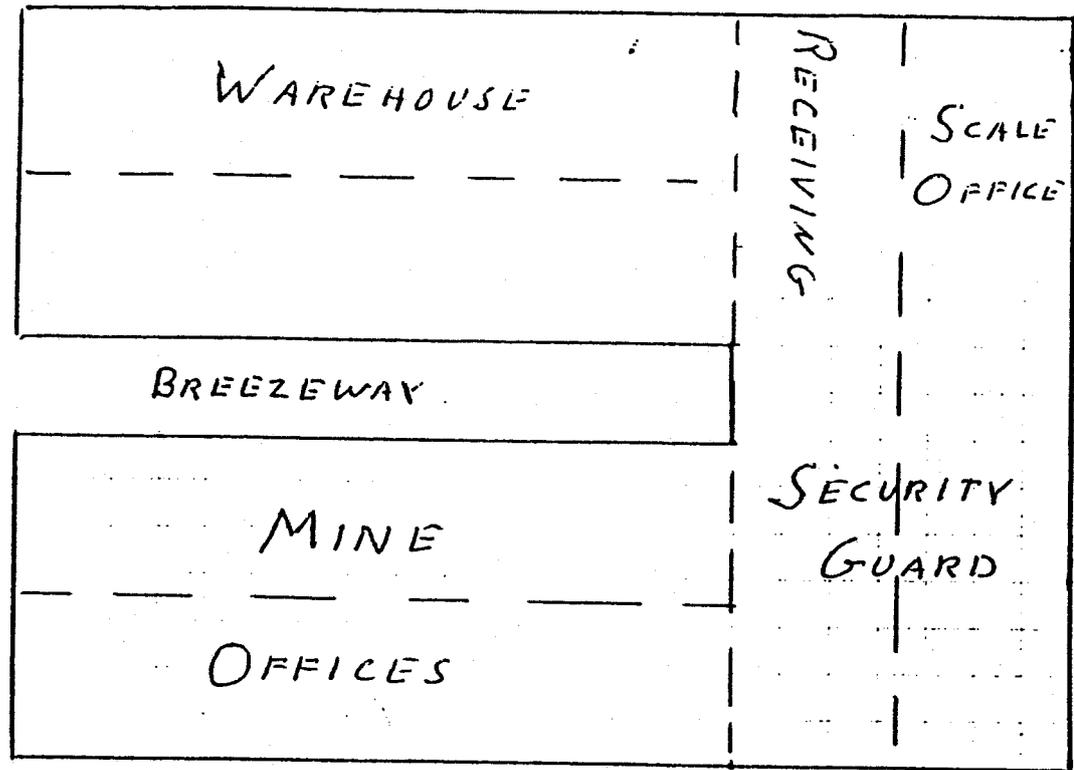
Scale: 1"=20'



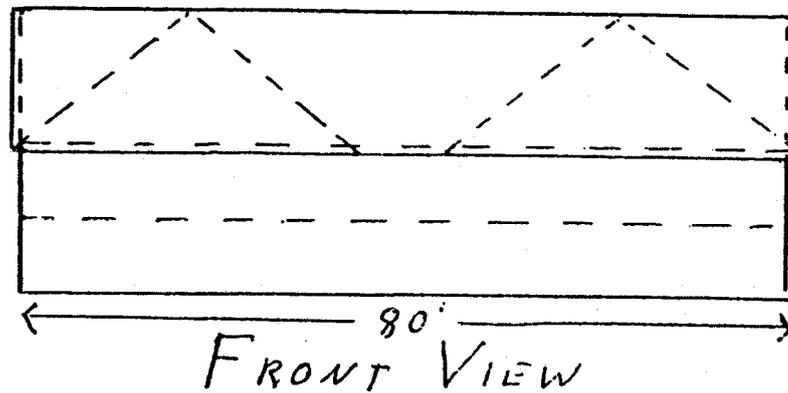
NON-COAL STORAGE AREA

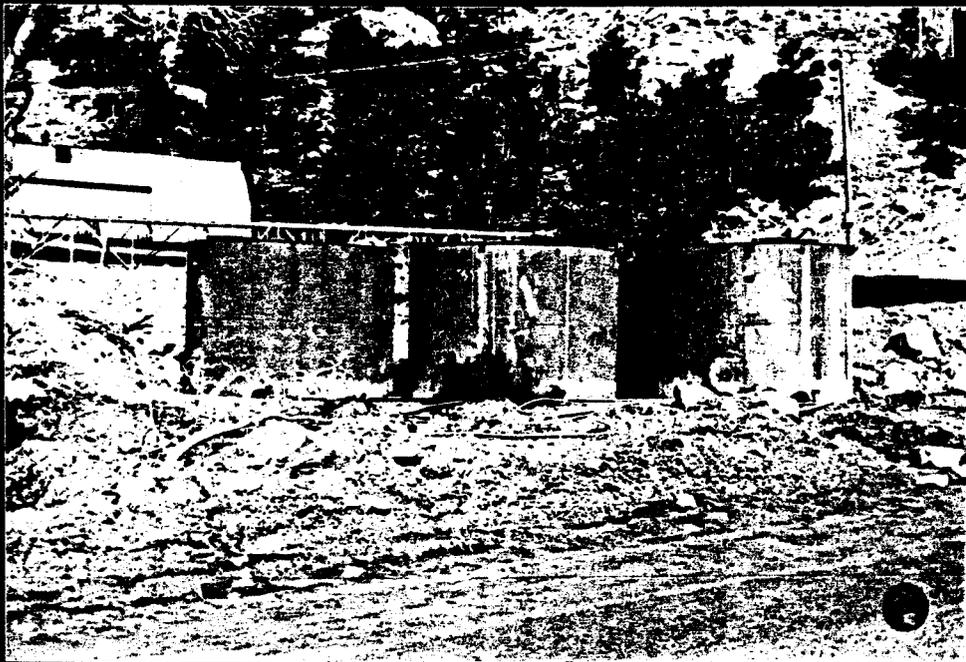
BEAR CANYON

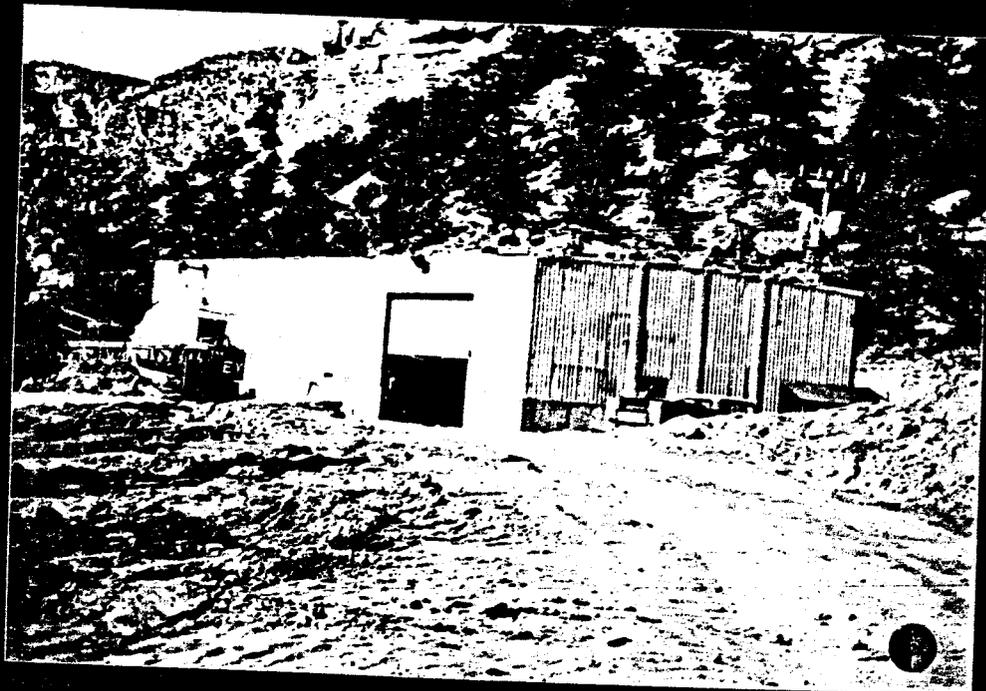
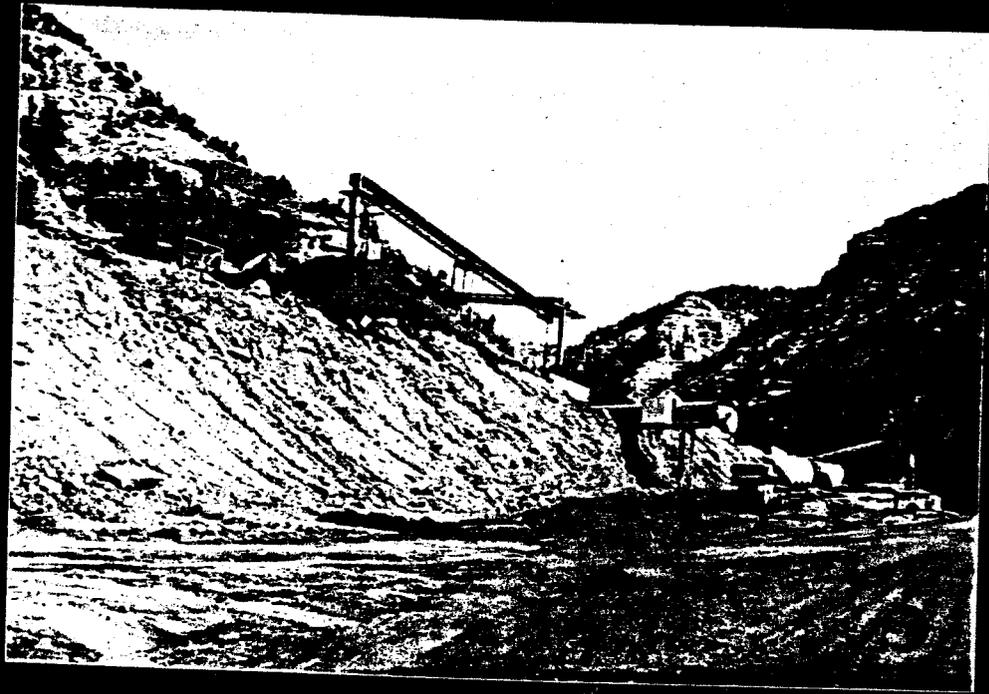
FIGURE
NO 1-1

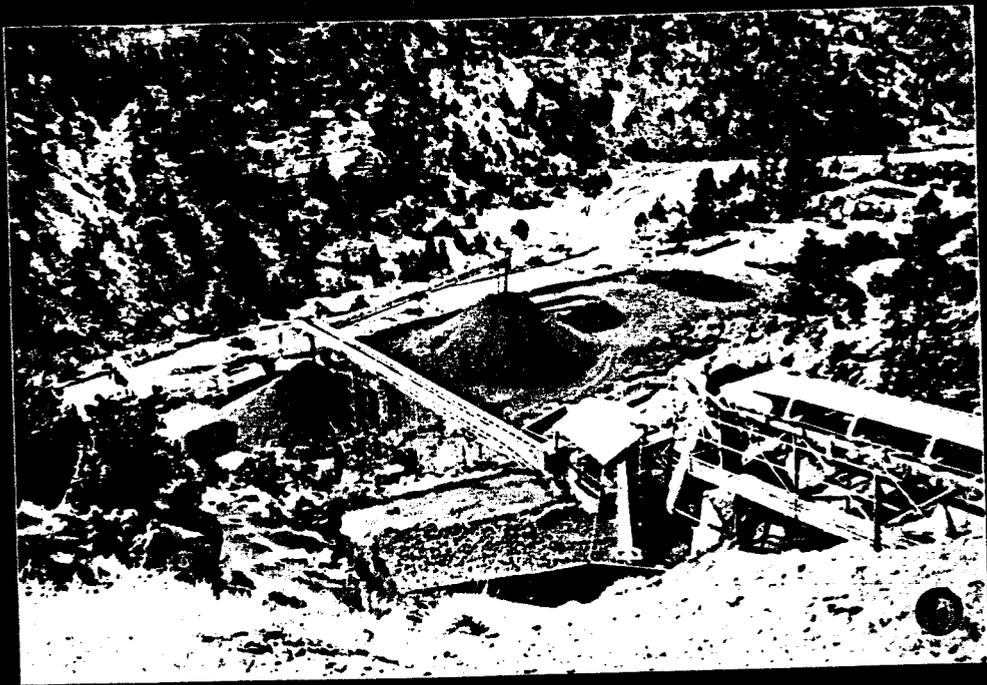
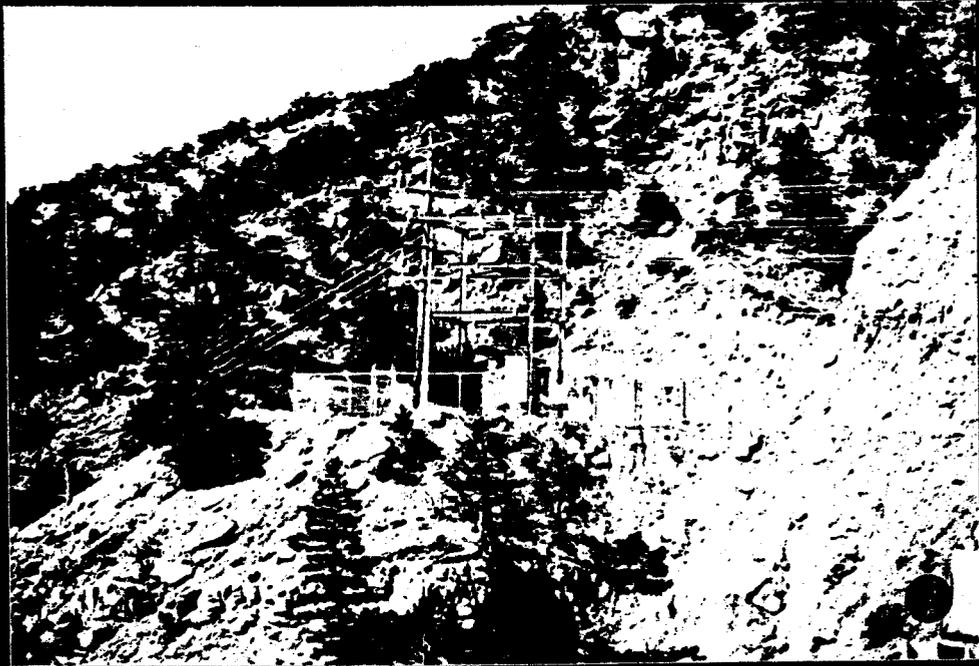


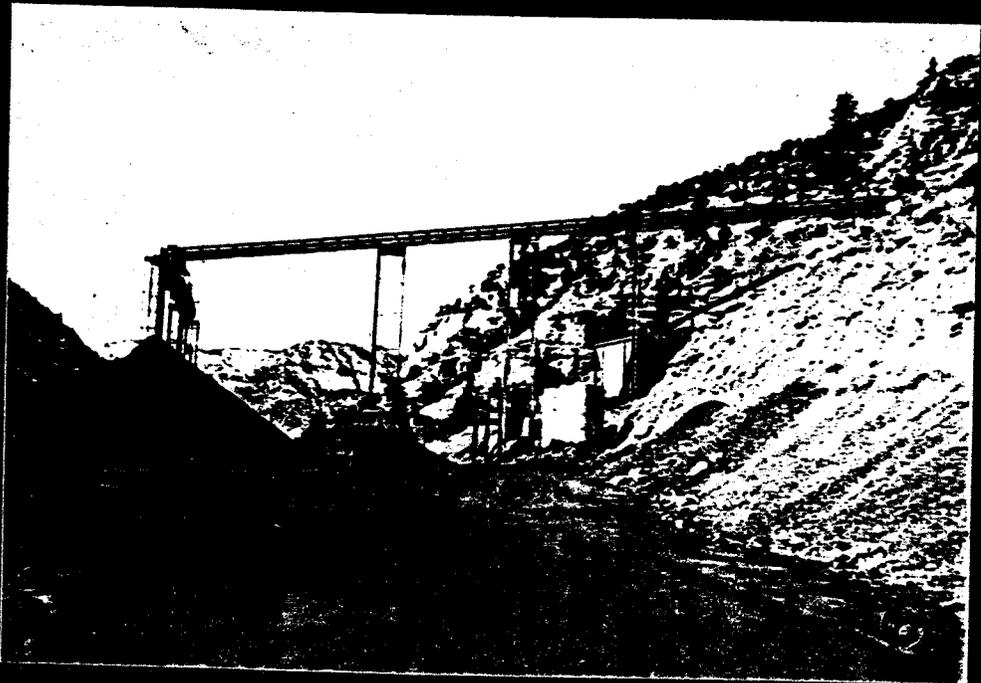
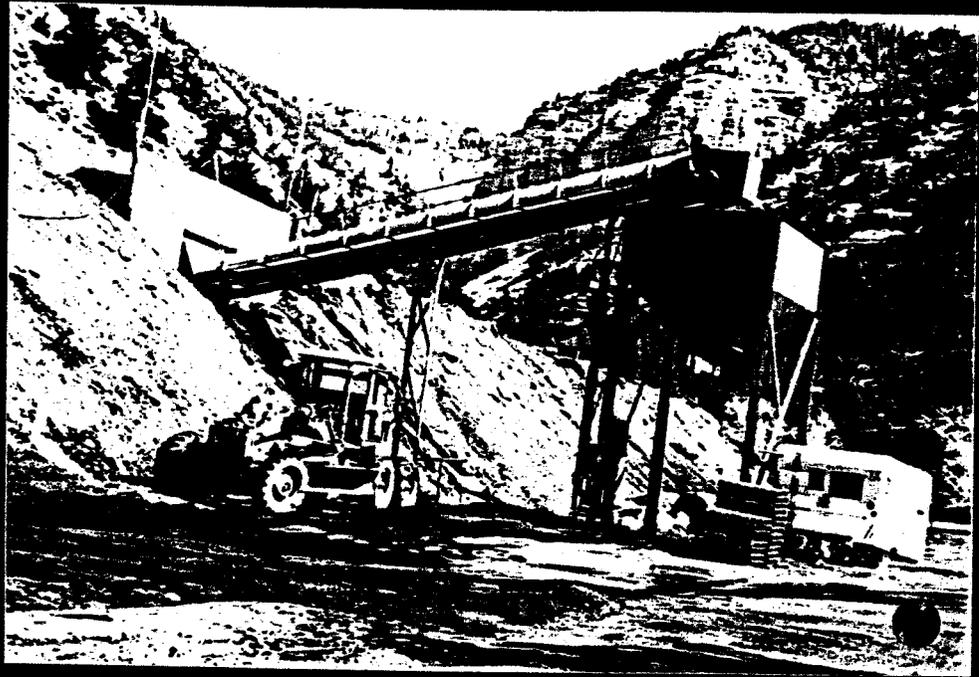
PLAN VIEW - UPPER LEVEL

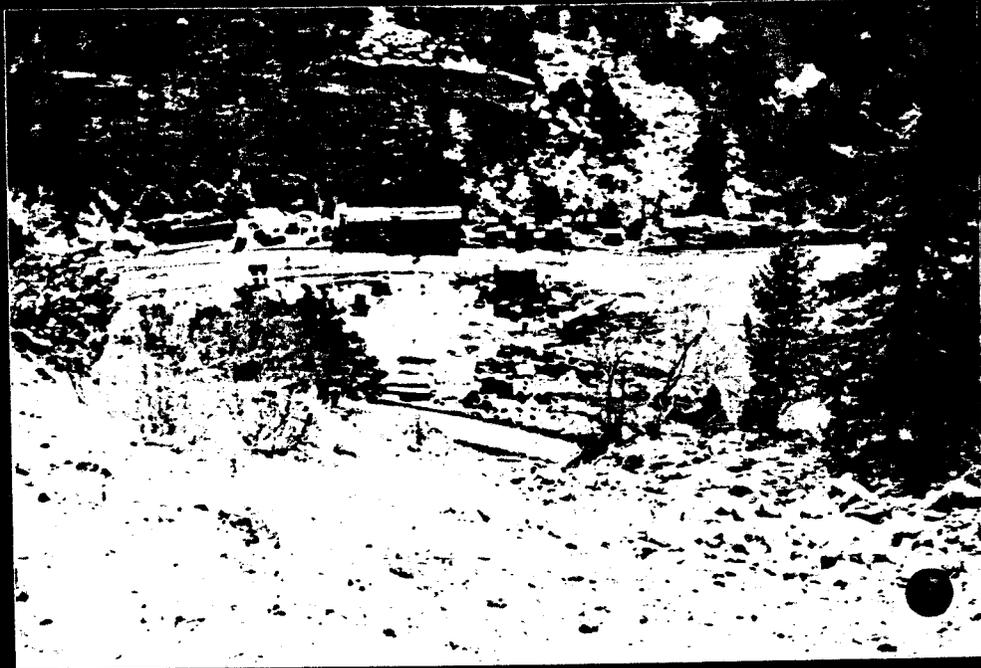
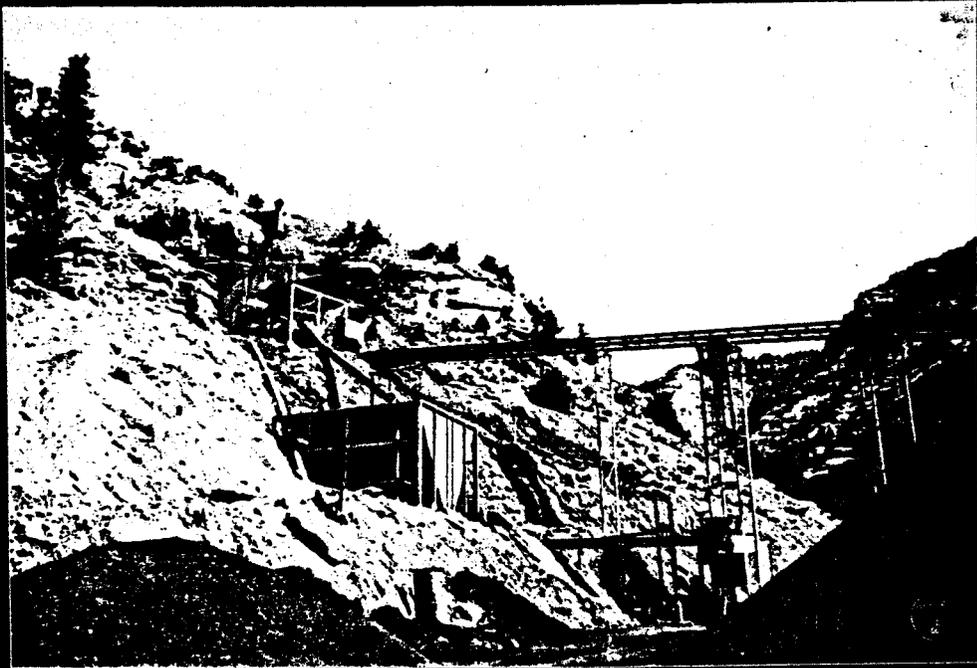












APPENDIX 3.3.6 A

WATER RIGHTS

WATER RIGHTS
APPLICATIONS

CO-OP MINING COMPANY, BEAR CANYON MINE
CULINARY WATER SYSTEM

Co-Op Mining Company, on September 2nd, 1983, applied for a change of Point of Diversion place and nature of use of water on Water Right A-35836 (93-1067). The application was approved on September 28, 1984. The purpose of the application and change was to facilitate a new mine located in Bear Canyon SE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 22, NE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 27 T16S, R7E, SLBM.

On June 10, 1985, an application for a change in nature of use was submitted to the Division of Water Rights to incorporate culinary (domestic use). (Applications and approval attached, Appendix A).

Pending the approval of said application, Co-Op has initiated construction of the following mining, irrigation and domestic water system;

Water is trapped in a portion of the old works of the Bear Canyon Mine. This mine was abandoned in the 1920's. The resulting of abandonment created a sump which is recharged through a number of seeps associated with regional faulting. This same source was utilized in conjunction with the abandoned Trail Canyon Mine. These old works are permanently sealed and well separated from the existing Bear Canyon Mine. A 1 $\frac{1}{2}$ " PVC schedule 40 pipe was installed to gravity feed a 10,000 gal. water storage tank located at the fan site. A distance of approximately 360' transversing the existing mine. This pipe is buried on all working areas of the mine to a depth of 4'.

8/23/85

Anticipated usage of the system is a potential of 1 family, and as many as 25 miners on 3 different shifts.

Laboratory analysis of the of the water indicates that it is of a suitable quality, and a sample has been sent to the Department of Health to determine bacterial content. The results of that test indicated "0" count.



STATE OF UTAH
NATURAL RESOURCES & ENERGY
Water Rights

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

14 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

INCORPORATED UNDER
THE LAWS OF THE STATE OF UTAH

NUMBER

SHARES



Huntington-Cleveland Irrigation Company

Capital \$150,000 150,000 Shares

This Certifies

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. 19 62

H. Jensen
SECRETARY

Rose Jensen
PRESIDENT

SHARES



SHARES

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AUG 22 1966

DIVISION OF OIL
GAS & MINING

Application for Permanent Change of Point of Diversion
Place and Nature of Use of Water
STATE OF UTAH

Please clearly and correctly complete the information requested below which defines the right or rights being changed. (Type or clearly print.)

For the purpose of obtaining permission to permanently change: the point of diversion , place , or nature of use , of water rights acquired by Charles W Kingston A-35836 (93-1067)
(Give Number of Application, certificate of appropriation, title and date of Decree or other identification of right.)

If the right described has been amended by a previous approved change application, give the number of such change application. No. A-6330

- The name of the applicant is Mrs. Charles W. (Lavenda) Kingston
- The post-office address of the applicant is 862 East Garfield Ave. SLC, Utah 84110
- The flow of water which has been or was to have been used in second-feet is .25
- The quantity of water which has been or was to have been used in acre-feet is _____
- The water has been or was to have been used for and during periods as follows:

Irrigation	from	April 1	to	October 31	incl.
(purpose)		(month) (day)		(month) (day)	
Mining	from	January 1	to	December 31	incl.
(purpose)		(month) (day)		(month) (day)	

 and stored each year (if stored) _____ from _____ to _____ incl. _____
 (month) (day) (month) (day)
- The direct source of supply is Tunnel (Tear Canyon) in Emery County.
(well, spring, stream, drain, river; if other explain)
- The point or points of diversion N. 210 ft. & W. 320 ft. from E4 Cor. Sec. 22, T16S, R7E, SLBM Hiawatha Quad. San Rafael R. Hydro Survey Sheet 21

(Must be the same as that of right being changed unless a previous change has been filed and approved. Then use the point or points approved in the previous change.)

8. Diversion works:
- If a well give diameter and depth _____
- If a dam and reservoir give height, capacity, and area inundated _____
- If other give type of diversion facility Pump and pipeline

9. The water involved has been or was to have been used for the following purposes in the following described legal subdivisions: (If used for irrigation, state sole or supplemental supply, and describe other supplemental rights.)

Irrigation SE4SE4 Sec. 22, NE4NE4 Sec. 27; T16S, R7E, SLBM

Total acres to be irrigated .50

Stockwatering (number and kind) _____

Domestic (number of families and/or persons, etc.) _____

Other Mining

10. The point at which water has been or was to have been returned to the stream channel is situated as follows: (Please describe method of return.) _____

Note: Paragraph 10 is to be completed only when all or part of the water is returned to the natural stream or channel.

The Following Changes Are Proposed

11. The flow of water to be changed in cubic feet per second is .25

12. The quantity of water to be changed in acre-feet is _____

Num 1
Appl. 1
Alpha 1
1 & k 1

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DIVISION OF OIL
GAS & MINING

13. The water will be used each year for:
 Irrigation from April 1 to October 31 incl.
 (purpose) (month) (day) (month) (day)
 Mining from January 1 to December 31 incl.
 (purpose) (month) (day) (month) (day)
 and stored each year (if stored) from _____ to _____ incl.
 (month) (day) (month) (day)

14. It is now proposed to divert the water from Tunnel (Bear Canyon)
 (i.e., spring, spring area, stream, river, drain, well, etc.)
 at a point(s) as follows: N. 79 ft. & E. 75 ft. from the SW cor. Sec. 24
 T16S, R7E, S16M Hiawatha Quad. San Rafael R. Hydro Survey Sheet 21
 (.8 1/2 miles N.W. of Huntington)

NOTE: The "point of diversion," or "point of return," must be located by course and distance or by rectangular distances with reference to some regularly established United States land corner or United States mineral monument if within a distance of six miles of either, or if a greater distance to some prominent and permanent natural object. A spring area must also be described by metes and bounds.

15. The proposed diverting and conveying works will consist of: (if a well, state diameter and depth thereof)
 Pump and Pipeline

16. If water is to be stored, give capacity of reservoir in acre-foot _____ height of dam _____
 area inundated in acres _____ legal subdivisions of area inundated _____

17. The water is to be used for the following purposes in the following described legal subdivisions: (if used for irrigation, state sole or supplemental supply, and describe other supplemental rights.)
 Irrigation SE 1/4, NE 1/4, SEC. 26; T 16S, R7E, S16M

Total acres to be irrigated .50

but limited to the sole irrigation supply of _____ acres.
 Stockwatering (number and kind) _____
 Domestic (number of families and/or persons, etc.) _____
 Other Mining

18. If paragraphs 11 and 12 designate that only part of the right described in paragraphs 1 to 10 inclusive is to be changed, designate the status of the water so affected by this change as to its being abandoned or used as heretofore.

EXPLANATORY

The following additional facts are set forth in order to define more clearly and completely the full purpose of the proposed change: The change in the point of diversion is due to a change in the location of mining tunnel

The undersigned hereby acknowledges that even though he may have been assisted in the preparation of the above-numbered application through the courtesy of the employees of the State Engineer's Office, all responsibility for the accuracy of the information contained therein, at the time of filing, rests with the applicant.

Lorenda Kingston
 Signature of Applicant

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OCT 21 1985

Form No. 107 3-66

WATER RIGHTS

CHANGE APPLICATION NO. a. 13694

RECEIVED

OCT 23 1985

DIVISION OF OIL
GAS & MINING

Application for Permanent Change of Point of Diversion
Place and Nature of Use of Water
STATE OF UTAH

Please clearly and correctly complete the information requested below which defines the right or rights being changed. (Type or clearly print.)

For the purpose of obtaining permission to permanently change: the point of diversion , place , or nature of use , of water rights acquired by Charles W. Kingston A-35836 (93-1067)
(Give Number of Application, certificate of appropriation, title and date of Decree or other identification of right.)

If the right described has been amended by a previous approved change application, give the number of such change application. No. a-6330

- The name of the applicant is Mrs. Charles W. (Lavenda) Kingston
- The post-office address of the applicant is 862 East Garfield Ave. SLC, Utah 84110
- The flow of water which has been or was to have been used in second-feet is .25
- The quantity of water which has been or was to have been used in acre-feet is _____

- The water has been or was to have been used for and during periods as follows:

<u>Irrigation</u>	from <u>April 1</u>	to <u>October 31</u>	<u>incl.</u>
(purpose)	(month) (day)	(month) (day)	
<u>Mining</u>	from <u>January 1</u>	to <u>December 31</u>	<u>incl.</u>
(purpose)	(month) (day)	(month) (day)	

 and stored each year (if stored) _____ from _____ to _____
 (month) (day) (month) (day)

6. The direct source of supply is Tunnel (Trail Canyon) Emery County.
(well, spring, stream, drain, river; if other explain)

7. The point or points of diversion N. 210 ft. & W. 320 ft. from E 1/4 Cor. Sec. 22, T16S, R7E, SLBM Hiawatha Quad. San Rafael R. Hydro Survey Sheet 21

(Must be the same as that of right being changed unless a previous change has been filed and approved. Then use the point or points approved in the previous change.)

- Diversion works:
 - If a well give diameter and depth _____
 - If a dam and reservoir give height, capacity, and area inundated _____
 - If other give type of diversion facility Pump and pipeline

9. The water involved has been or was to have been used for the following purposes in the following described legal subdivisions: (If used for irrigation, state sole or supplemental supply, and describe other supplemental rights.)

Irrigation SE 1/4 SE 1/4 Sec. 22 NE 1/4 NE 1/4 Sec. 27; T16S, R7E, SLBM

Total acres to be irrigated .50

Stockwatering (number and kind) _____

Domestic (number of families and/or persons, etc.) _____

Other Mining

10. The point at which water has been or was to have been returned to the stream channel is situated as follows: (Please describe method of return.) _____

Note: Paragraph 10 is to be completed only when all or part of the water is returned to the natural stream or channel.

The Following Changes Are Proposed

- The flow of water to be changed in cubic feet per second is .25
- The quantity of water to be changed in acre-feet is _____

13. The water will be used each year for:
 Irrigation from April 1 to October 31 incl.
 (purpose) (month) (day) (month) (day)
 Mining & Domestic from January 1 to December 31 incl.
 (purpose) (month) (day) (month) (day)
 and stored each year (if stored) from January 1 to December 31 incl.
 (month) (day) (month) (day)

14. It is now proposed to divert the water from Tunnel (Bear Canyon)
 (i.e., spring, spring area, stream, river, drain, well, etc.)
 at a point(s) as follows: N. 79 ft. & E. 75 ft. from the SW cor. Sec. 24
 T.16S, R7E, S1BM Hiawatha Quad. San Rafael R. Hydro Survey Sheet 21
 (8 1/2 miles NW of Huntington)

NOTE: The "point of diversion," or "point of return," must be located by course and distance or by rectangular distances with reference to some regularly established United States land corner or United States mineral monument if within a distance of six miles of either, or if a greater distance to some prominent and permanent natural object. A spring area must also be described by metes and bounds.

15. The proposed diverting and conveying works will consist of: (if a well, state diameter and depth thereof)
 Pump and Pipeline

16. If water is to be stored, give capacity of reservoir in acre-feet. NA* height of dam. NA
 area inundated in acres. NA legal subdivisions of area inundated
 *2 - 10,000 gal. tanks

17. The water is to be used for the following purposes in the following described legal subdivisions: (if used for irrigation, state sole or supplemental supply, and describe other supplemental rights.)
 Irrigation SE 1/4, SE 1/4, Sec. 26; T.16S, R7E, S1BM

Total acres to be irrigated 50
 but limited to the sole irrigation supply of _____ acres.
 Stockwatering (number and kind)
 Domestic (number of families and/or persons, etc.) 1 family, shower house 25 mine pers.
 Other Mining

18. If paragraphs 11 and 12 designate that only part of the right described in paragraphs 1 to 10 inclusive is to be changed, designate the status of the water so affected by this change as to its being abandoned or used as heretofore.

EXPLANATORY

The following additional facts are set forth in order to define more clearly and completely the full purpose of the proposed change: The change in the point of diversion is due to a change in the location of mining tunnel.

The undersigned hereby acknowledges that even though he may have been assisted in the preparation of the above-numbered application through the courtesy of the employees of the State Engineer's Office, all responsibility for the accuracy of the information contained therein, at the time of filing, rests with the applicant.

Lawrence W. Sturgeon
 Signature of Applicant

August 20, 1985
Salt Lake City, Utah

TO WHOM IT MAY CONCERN:

I, LaVenda Kingston, widow of C. W. Kingston and owner of 333.77 shares of stock in and to the Huntington Cleveland Irrigation Company, hereby grant unto Co-op Mining Company, the right to use the water represented by such shares in its mining operations, or for any other use Co-op Mining Co. deems appropriate.

LaVenda Kingston

LaVenda Kingston

APPENDIX 3-B

ROOF CONTROL PLAN

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. H. E. ✓

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 clean 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

B.W. Stoddard
B.W. Stoddard

9.14.83
H.E.

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

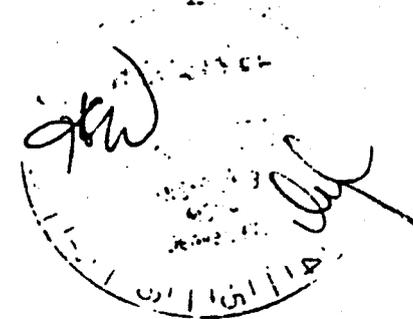
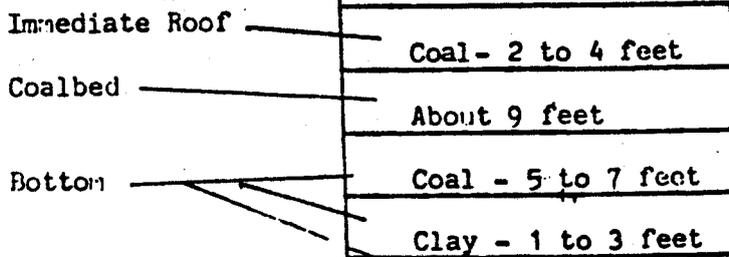
C. Location (reference to nearest highway route, direction, and distance)
2 Miles East Off Route No. 31

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



G. B.W. Stokland Min 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 _____

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.

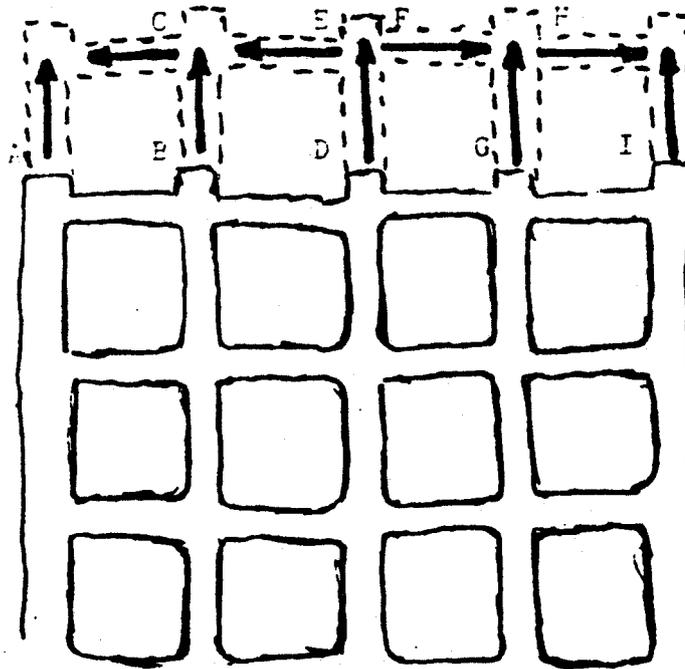
Sincerely,


John W. Barton
District Manager

JWB:J.S.Miller:mh

cc: Price
Orangeville
DTSC
State

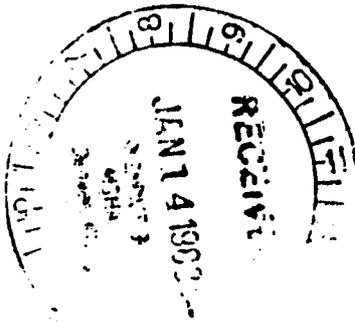
Sketch #1



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 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.



LOOP SUPPORT MATERIALS FOR RESIN GROUTED RODS

RODS Manufacturer's
Manufacturer Birmingham Designation 6 or 7 x 12
OR EQUIVALENT
Minimum Length 12" Diameter 3/4 or 7/8
Type Steel #40 rebar Type Head square
Minimum Yield 40,000 lbs.
Dimensions of Rod: Head 1 1/2" Flange 1 7/8"

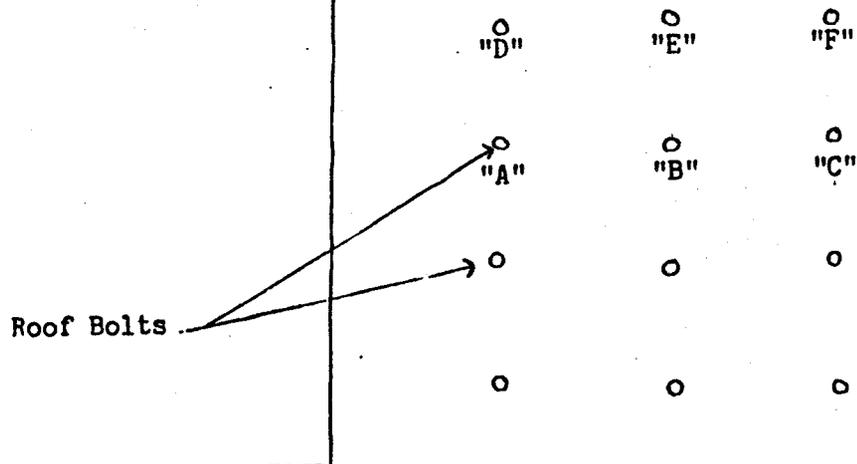
BEARING PLATES

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

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

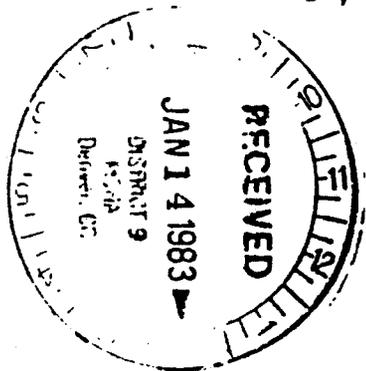
Prior approval shall be obtained before making any changes in the materials listed.

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.

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.

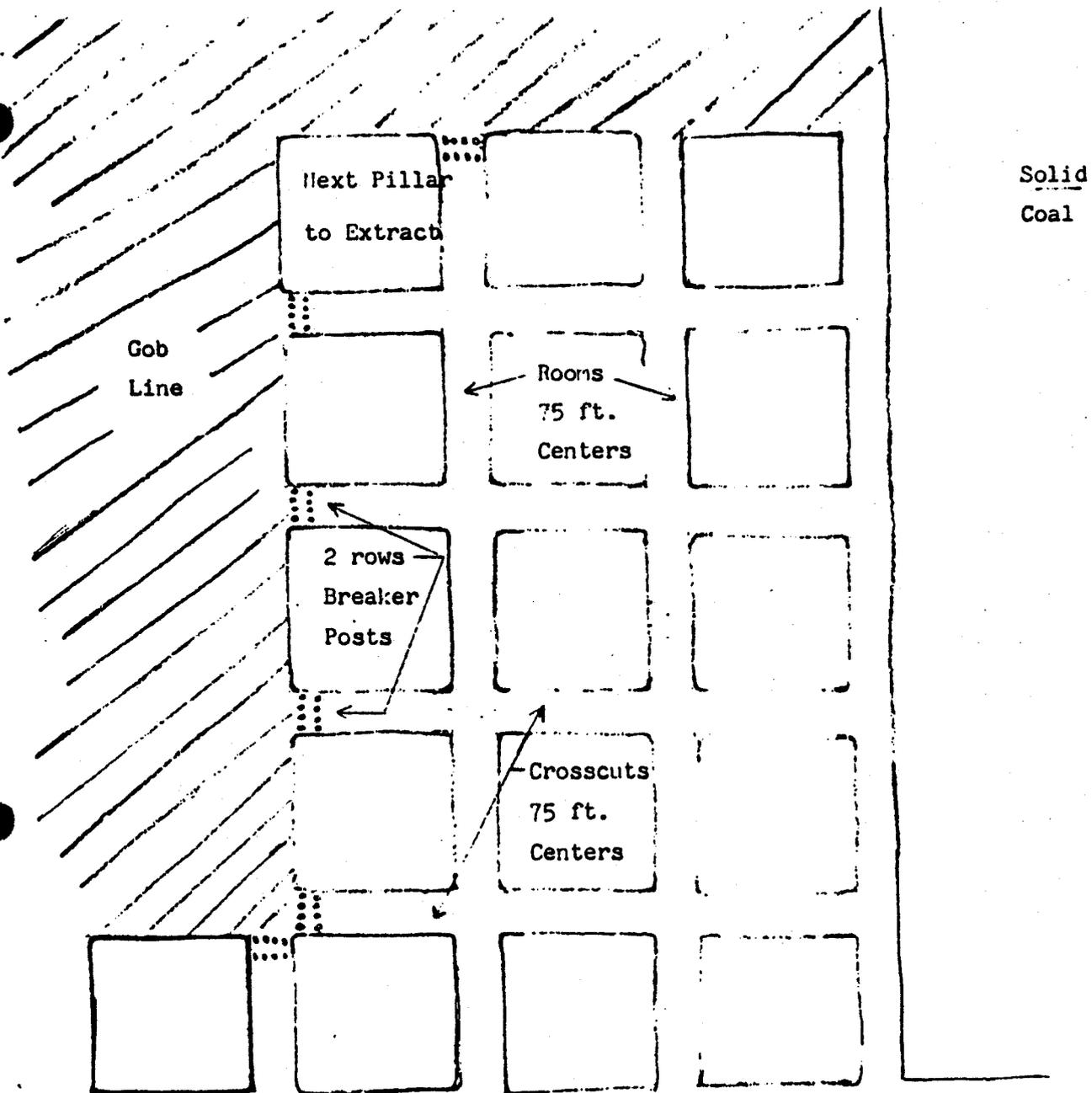
1. Rooms are run on 75 ft. centers and are 13 ft. to 20 ft. wide. crosscuts are run on 75 ft. centers and are run 13 ft. to 20 ft. wide. The total coal seam is about 19 ft. high. Rooms and crosscuts are developed about 9 ft. high. Four ft. of top coal is left for safe roof. About 6 ft. of bottom coal 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

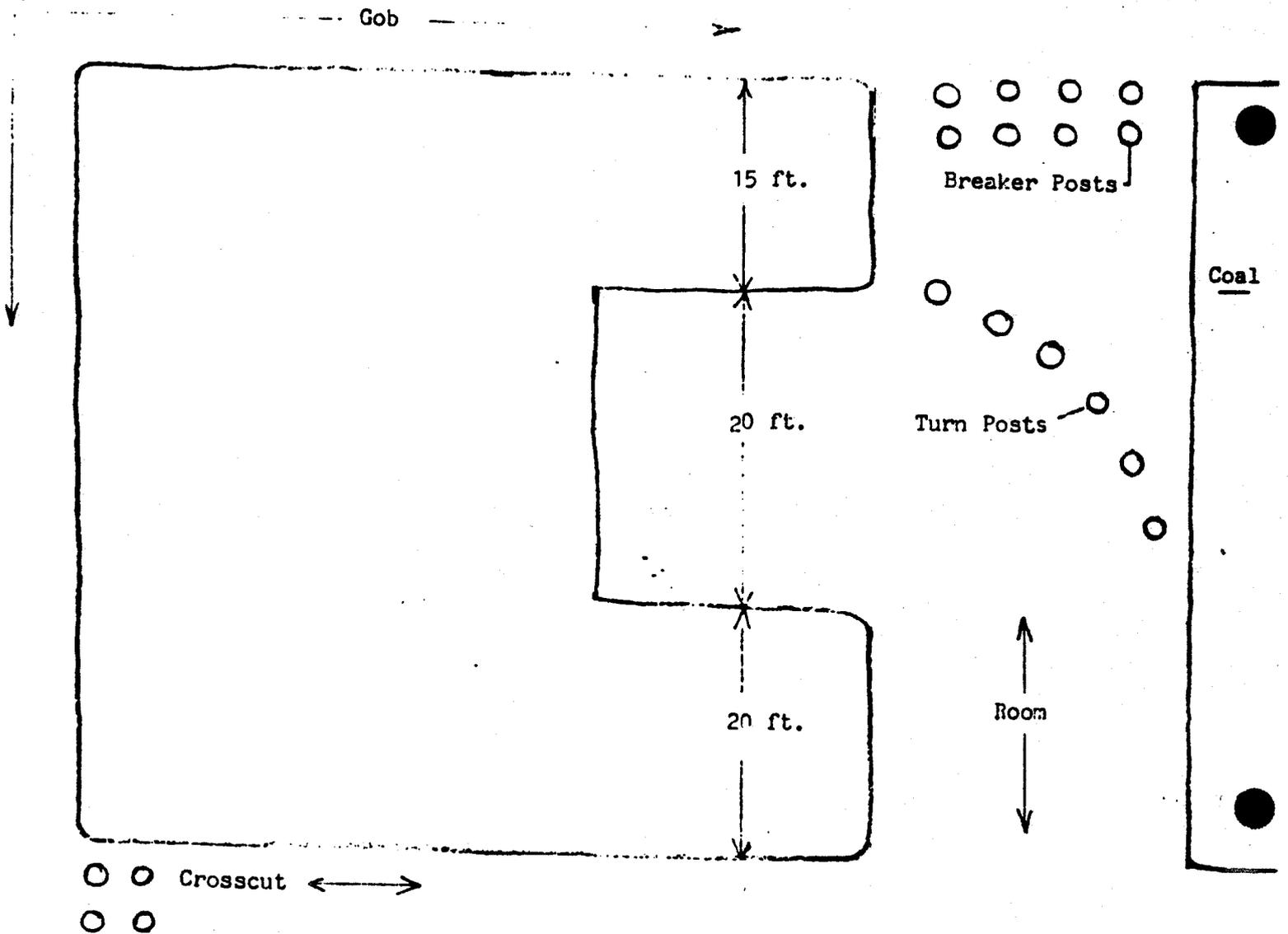
Two rows of breaker posts are set on 4 ft. centers across each opening leading into pillard areas. Such posts are installed near the break-line between the split being started and the gob.

Sketch No. 1

Bear Canyon No. 1

Mine I.D. No. 42-01607

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

INTERIM RECLAMATION PLAN

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

<u>SPECIES</u>	<u>RATE PER ACRE</u>
	<u>HYDROSEED</u>

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
------	----

APPENDIX 3 - D

TOP SOIL

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

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

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

DATE RCVD 11-2-82
 REPORTED 11-23-82

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

TEXTURE <small>silt, silty sand, sandy loam, loamy 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
LD	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

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 fact. 2. P x 2.3 = P₂O₅ K x 1.2 = K₂O S x 3 = S

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 _____

Diana Lansing

ATTACHMENT #2-A

RECOMMENDED SEED MIXBEAR CREEK MINECO-OP MINING COMPANY

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

ATTACHMENT 3-A

SOIL LEGEND

SOIL SYMBOL

SOIL MAPPING UNIT NAME

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-freeze 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.

Attachment B-A

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

TOXIC MATERIALS & HANDLING

APPENDIX 3E

TOXIC MATERIAL HANDLING PLAN

"Any material that is contaminated with coal, as determined by visual observation, will be placed against the highwall and buried beneath a minimum of 3' of fill material during reclamation. Material that is contaminated with oil or grease or any other potentially acid or toxic matter, as determined by visual means, will be placed against the highwall and covered with a minimum of 4' fill, top soiled, and reclaimed. Isolation of such material will be by use of berms and a backhoe or loader.

Since the roof material from the mine has shown a high SAR value, any roof rock that is stored on the surface will be isolated by a berm as long as it is stored on site. During reclamation, this material will be placed against the toe of the highwall and covered with a minimum of 4' of material, covered with 6" of top soil and revegetated."

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 ml 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 µm 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. I 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. 1
(mg/L)

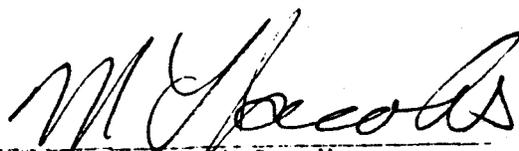
EP Toxicity

<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

BAH/cl


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



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 UDOGM 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.

COMMERCIAL TESTING & ENGINEERING CO.



July 22, 1983

Phone: 303-278 9521

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

Mr. Jack Blair
CT & E Co.
224 South Carbon Ave.
Price, Utah 84501

CO-OP MINING COMPANY
Pond Sample
Lab No. 57-13312

Re: IAD # 97-M179-335-01

Analytical Report

One coal sample was received for analysis on July 12, 1983.
This sample was assigned our IAD identification # 97-M179-335-01.

The sample was prepared to No.10 mesh size in accordance with the procedure of U.S.D.A. Handbook #60. Electrical Conductivity and pH were determined in accordance with the same publication.

Acid/Base Potential was determined in accordance with the procedure of the Environmental Protection Agency, EPA-670/2-74-070. This procedure is used for the Wyoming DEQ and in telephone conversation with the Utah Division of Oil, Gas & Mining we were advised that this procedure is acceptable for the requirements of the State of Utah.

The results of these determinations are presented in Table No.1 and are reported in units as indicated in the Table.

Table No. 1

<u>Parameter</u>	<u>57-13312</u>
pH, paste (Standard Units)	7.6
Electrical Conductivity (μ mhos/cm)	195
Acidity Potential*	0
Neutralization Potential*	29.8
Acid/Base Potential*	29.8

*Values are reported in Tons CaCO_3 Equivalent / 1000 tons.

Texture determination was not performed as the sample is carbolithic and thus the determination of Sand, Silt and Clay fractions is not applicable in this case.



If you have any questions concerning these results, please call.

Harold A. Connell
Harold A. Connell
Assistant Lab Manager

Robert L. Taylor
R.L. Taylor, Ph.D. Manager 2-2 Jul 83
Instrumental Analysis Division



COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300

Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
490 ORCHARD ST., GOLDEN, CO 80401
TELEPHONE: (303) 278-9521

Commercial Testing & Engineering
224 So. Carbon Avenue
Price, Utah 84501

Date: July 03, 1986
IAD #97-W406-335-03
Received: 06/18/86

Material: Soil

Procedure: EP Toxicity per EPA, Hazardous Waste and Consolidated Permit Regulations, Federal Register, Monday, May 19, 1980.
Acid Potential, Neutralization Potential and Clay Content per EPA, 600/2-78-054.

Results: EP Toxicity reported in milligrams per Liter (mg/L), on an extract basis.
Acid Potential and Neutralization Potential reported as tons CaCO₃/1000 tons material.
Clay Content reported in weight percent (wt. %).

RECEIVED
JUL 16 1986
DIVISION OF
OIL, GAS & MINING

Table I
EP Toxicity

Parameter	Roof	Coal	Floor
Arsenic, As	<0.001	<0.001	<0.001
Barium, Ba	<0.8	<0.8	<0.8
Cadmium, Cd	<0.006	<0.006	<0.006
Chromium, Cr	<0.02	<0.02	<0.02
Lead, Pb	<0.04	<0.04	<0.04
Mercury, Hg	<0.0002	<0.0002	<0.0002
Selenium, Se	<0.002	<0.002	<0.002
Silver, Ag	0.017	<0.008	0.019
initial pH, s.u.	9.3	7.3	9.5
final pH, s.u.	6.9	4.9	5.1
mLs acetic acid added, per 100g sample	400	50	400

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • (312) 953-9300

PLEASE ADDRESS ALL CORRESPONDENCE TO:
224 SO. CARBON AVE., PRICE UT 84501
OFFICE TEL. (801) 637-7540

July 7, 1986

Co-op Mining Co.
P.O. Box 300
Huntington, Utah 84528

Sample identified
by **Mel Coonrod**

Roof Sample
Coal Sample
Floor Sample

Kind of sample
reported to us **Soil**

Sample taken at **Hiawatha Seam**

Sample taken by **Mel Coonrod**

Date sampled **6-1-86**

Date received **6-2-86**

RECEIVED
JUL 16 1986

DIVISION OF
OIL, GAS & MINING

Analysis report no. **57-21437, 38, 39**

SULFUR FORMS

	<u>Roof</u>	<u>Coal</u>	<u>Floor</u>
Pyritic Sulfur	0.06	0.01	0.02
Sulfate Sulfur	0.01	0.01	0.02
Organic Sulfur (Diff.)	xxxx	0.56	xxxx
Total Sulfur	xxxx	0.58	xxxx

Reported As Dry Basis Only

WH/sm

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Walter J. Hawley
Manager, Price Laboratory



Charter Member

Original Copy Watermarked
For Your Protection

Table II

<u>Parameter</u>	<u>Roof</u>	<u>Coal</u>	<u>Floor</u>
Acid Potential, tons CaCO ₃ /1000 tons	1	15	<1
Neutralization Potential, tons CaCO ₃ /1000 tons	595	6.3	488
Clay Content, Wt. %	---	---	25.4

RECEIVED
JUL 16 1985

DIVISION OF
OIL, GAS & MINING

If you have any questions concerning these results, please feel free to call.

Martha L. Turner

Martha L. Turner
Supervisor
Environmental Section

MLT/vmc



APPENDIX 3-F

SLOPE STABILITY ANALYSIS

Dames & Moore



250 East Broadway, Suite 200
Salt Lake City, Utah 84111
(801) 521-9255
TWX: 910-925-5692 Cable: 910-925-5692

February 20, 1981

Mr. Wendell Owen
Co-op Mining Company
Box 300
Huntington, Utah 84528

Dear Mr. Owen:

Summary Report
Slope Stability Analyses
Bear Creek Portal
Access Road
Near Huntington, Utah
For Co-op Mining Company

INTRODUCTION

This report summarizes the results of our stability analyses of the slopes along the Bear Creek Portal Access Road located northwest of Huntington, Utah.

PURPOSE AND SCOPE

The purpose and scope of this study were planned in discussions between Mr. Wendell Owen of Co-op Mining and Mr. Bill Gordon of Dames & Moore. In general, the purpose of this investigation was to analyze the stability of the side-cast cut and fill slopes along the Bear Creek Portal Access Road.

Mr. Wendell Owen
February 20, 1981
Page -2-

BACKGROUND

The Co-op Mining Company is in the process of reopening an abandoned coal mine at the Bear Creek Portal. Several abandoned facilities from a previous mining effort exist near the portal. We understand that the existing old portal will be used for ventilation of the new mine. The mine is located on a steep slope in the Wasatch Plateau and access to the portal is by a typical unsurfaced access road constructed by conventional side-cast methods.

Co-op Mining Company was issued a citation by the Department of Natural Resources Division of Oil, Gas, and Mining. The nature of the violation was with regard to the placement of side-cast cut and fill material on steep slopes (20 degrees or more). Regulations require that such fills achieve a minimum static factor of safety of 1.5.

An engineering geologist from Dames & Moore previously visited the site and performed a reconnaissance survey of the area and sideslopes in question. Laboratory tests have been performed on samples of the side-cast cut and fill material obtained at the site. These laboratory tests included sieve analyses and Atterberg Limits. The results of these laboratory tests, a discussion of our site reconnaissance survey, and a summary of our conclusions were presented in a report dated December 29, 1980*.

*"Report, Geotechnical Consultation, Bear Creek Portal, Near Huntington, Utah, For Co-op Mining Company."

Mr. Wendell Owen
February 20, 1981
Page -4-

site and our experience with similar soils, we have assumed the following soil properties:

Side-Cast Fill Material

Angle of Internal Friction	$\phi = 26^{\circ}$
Cohesion	C = 350 psf
Unit weight soil	$\delta = 98$ pcf

Natural Soils

Angle of Internal Friction	$\phi = 26^{\circ}$
Cohesion	C = 700 psf
Unit weight soil	$\delta = 120$ pcf

SLOPE STABILITY ANALYSIS

To aid in evaluating the stability of the side-cast cut and fill material of the Bear Creek Portal Access Road, a computer slope stability analysis was performed. The computer analysis utilized a simplified Bishop's Method in computing the long-term static factor of safety of the slopes. Due to the limited laboratory and field data, and the uncontrolled method in which side-cast cut and fill materials are placed, ultra conservative soil strength parameters were used in the computer analysis. A Geometric cross-section of a critical section utilized in the analysis is shown on Plate 2, Slope Cross Section. It was also assumed that a phreatic water surface would not develop in the slopes of the embankment.

The computer program analyzed the slope stability by searching a specified coordinate grid area for the center of the circle

Mr. Wendell Owen
February 20, 1981
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having the lowest factor of safety. The slope stability analyses was performed using a total of four separate coordinate grid areas. The number of trial failure arc centers analyzed in each of these four areas varied from 12 to 63. As indicated on Plate 2, this analysis indicated a minimum static factor of safety varying from 1.43 to 2.15.

Copies of the results of the computer analysis for each coordinate grid area are included with this report.

DISCUSSIONS AND RECOMMENDATIONS

GENERAL

Supporting data upon which our recommendations are based have been presented in the previous sections of this report and in the previous Dames & Moore report dated December 29, 1980.

SLOPE STABILITY

The computer slope stability analysis indicates a minimum static factor of safety varying from 1.43 to 2.15 for the trial arcs analyzed.

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.

Mr. Wendell Owen
February 20, 1981
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Stability of the slopes will be influenced by the degree of saturation of the existing soils. Therefore, surface drainage must be channeled to minimize runoff over the slopes. However, during wet periods of the year, small localized slides and sloughs should be anticipated along the slopes. However, these occurrences should be minor. The performance of these side-cast cut and fill slopes is anticipated to be similar to virtually identical side-cast cut and fill slopes along the nearby road leading to the Trail Canyon Portal. These slopes have been stable since their construction, varying from 10 to 25 years ago.

Based on our slope stability analysis and observations made during our reconnaissance visit to the site, it is our opinion that the side-cast fill material located along the Bear Creek Portal Access Road generally has a long-term static factor of safety of 1.5 or greater and will perform in a satisfactory manner.

o0o

Mr. Wendell Owen
February 20, 1981
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We appreciate the opportunity of performing this service for you. If you have any questions or require additional information, please contact us.

Very truly yours,

DAMES & MOORE



William J. Gordon
Associate
Professional Engineer, No. 6177
State of Utah



Douglas G. Beck
Staff Engineer

WJG/DGB/wb

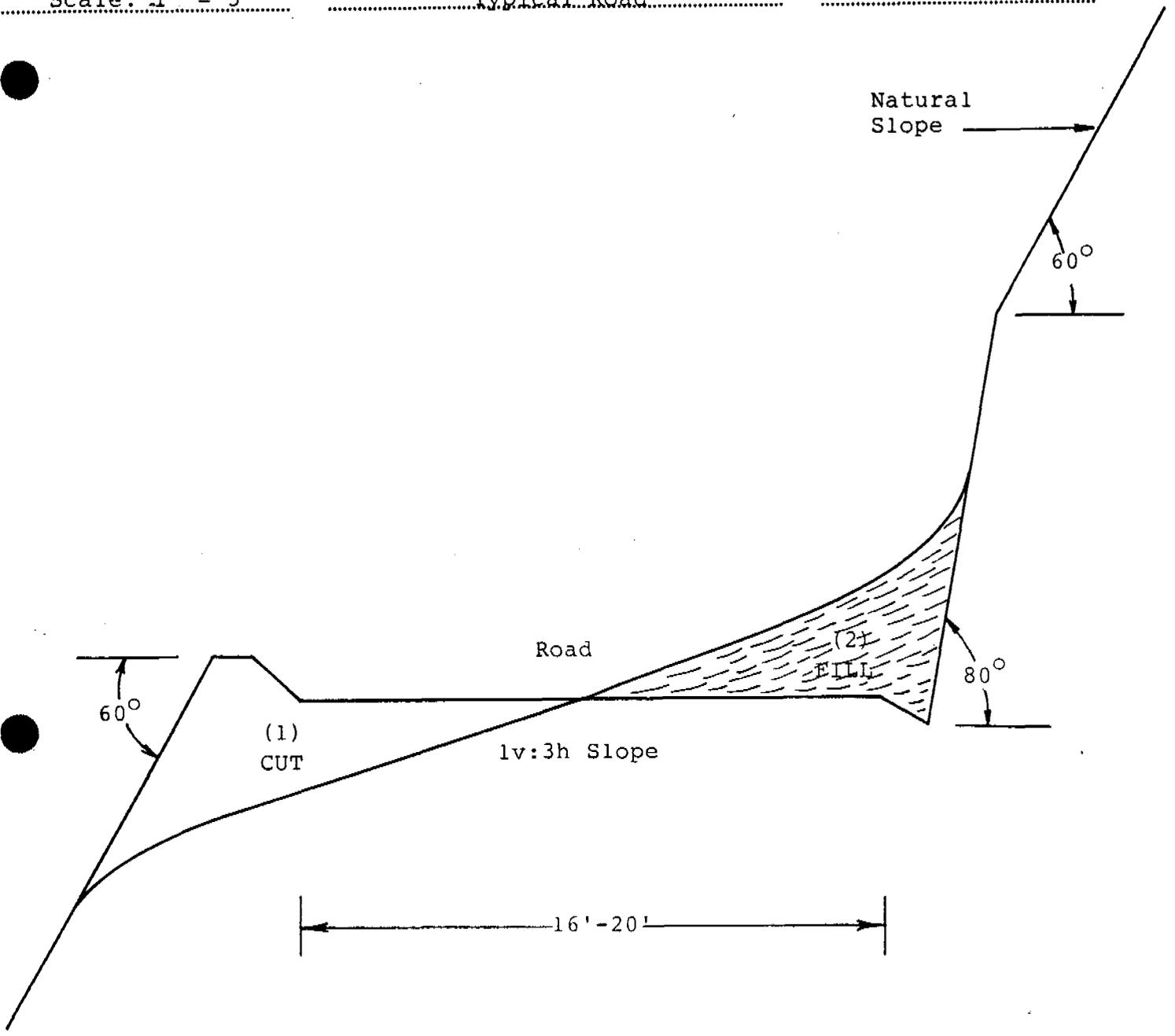
Attachments"

Plate 1 - Plot Plan
Plate 2 - Slope Cross-Section
Computer Analysis Results

cc: Department of Natural Resources
Division of Oil, Gas and Mining (2)

BY D. Guy DATE 5/11/85 SUBJECT Recontouring
of
Scale: 1" = 5' Typical Road

SHEET NO. 41 OF 1
JOB NO.



Note: Area (1) is placed in Area (2).

CO-OP Mining Company
December 29, 1980
Page-2-

We understand that a violation of the Federal Regulations (Section 717.14 in the Federal Register, Vol. 42, No. 252, p. 62695, issued December 13, 1977) was issued by the State Department of Oil Gas and Mining to CO-OP Mining Company. Part (a) of this section states that surface operations on steep slopes (20 degrees or more) "shall be conducted so as not to place any material on the down slope below road cuts, mine workings or other benches, other than in conformance with part (a)(1)" of Section 717.14. Part (a)(1) states that fills shall achieve a minimum static safety factor of 1.5.

The slope where the Bear Creek Portal is located is steeper than 20 degrees and the only feasible way to construct the access road is by conventional side-cast methods. Therefore, the static factor of safety of the side-cast material is the key issue.

DISCUSSION

The material being excavated and forming the side-cast fill is gravel and cobble sized pieces of silty sandstone in a sandy and silty clay matrix. Calcium carbonate derived from the cement in the sandstone is also present. The results of a partial grain size analysis are tabulated below:

<u>SIEVE NUMBER</u>	<u>PERCENT FINER BY WEIGHT</u>
#4	72.2
#40	64.0
#200	37.2

The results of an Atterberg Limit determination performed on the material finer than the number 200 sieve are tabulated below:

<u>LIQUID LIMIT (%)</u>	<u>PLASTIC LIMIT (%)</u>	<u>PLASTICITY INDEX</u>	<u>UNIFIED SOIL CLASSIFICATION</u>
30.5	15.6	14.9	CL

During our reconnaissance, we examined the access road leading to the Trail Canyon Portal in Section 22. This road is in virtually identical conditions to the road leading to the Bear Creek Portal. Some of the side-cast fill near the Trail Canyon Portal is 25 years old; the youngest of it is about 10 years old. The side-cast fill material near the Trail Canyon Portal is nearly everywhere sloping at 35 degrees (approximately 1-1/2 horizontal to 1 vertical).

The side-cast material appears to be performing in a satisfactory manner. In many places, the side-cast material appears to be very similar to natural slopes between nearly vertical exposures of resistant sandstone. Very minor gullies and slumps are present locally. Vegetation is becoming established on some of the slopes.

The surface of the side-cast material is quite firm and difficult to walk on because boot heels don't penetrate. We believe that the reason the surface is so firm is related to the clay and the calcium carbonate in the soil. The clay gives the soil cohesive strength and the calcium carbonate tends to cement the soil particles together.

The calcium carbonate cement in the soil is probably a significant constituent in the safety factor of side-cast fill material which has remained stable for 25 years in a situation identical to the access road leading to the Bear Creek Portal.

CO-OP Mining Company
December 29, 1980
Page-4-

CONCLUSION

Based on observations made during our reconnaissance and the discussions presented above, it is our opinion that the side-cast material located adjacent to the access road leading to the Bear Creek Portal will behave in a manner similar to the side-cast material located adjacent to the access road leading to the Trail Canyon Portal. Since the material near the Trail Canyon Portal has been grossly stable for 10 to 25 years as determined by its performance, we believe that the material placed during construction of the Bear Creek Portal access road will also be grossly stable.

Consequently, we believe that the stability concern identified in the regulations can best be addressed by the empirical evidence of the performance of similar material in a similar situation rather than a calculated factor of safety.

We trust that this report satisfies your present needs. If you have any questions or require additional discussions or information, please contact us.

Very truly yours,

DAMES & MOORE



William J. Gordon
Associate
Professional Engineer No. 3457
State of Utah

Jeffrey R. Keaton
Engineering Geologist

WJG/jrk/kc

BARES AND (SLOPED)
 SLOPE STAGE SIMPLIFIED BISHOP'S METHOD
 DATE OF LAST PRINTING 11 78
 DATE RUN - 02/19/81 TIME RUN - 19.00.45
 0546101206 6093 BMB 022081 STABILITY ANALYSIS CUTSLOPE PARTIAL FILL

DATA INPUT MODE = 1
 EARTHQUAKE COEFFICIENT = 0.000
 PORE PRESSURE IS DEFINED BY WATER LINE DATA
 TOTAL NUMBER OF SOIL LINES = 6 NUMBER OF WATER LINES = 0

LINE NO	COORDINATES				SOIL DATA		FRICT. ANGLE (DEG)		COHESION (PSF)		PORE PRESSURE RATIO		NEW BELOW	MUU ABOVE	MUU BELOW
	LEFT-X	LEFT-Y	RIGHT-X	RIGHT-Y	WT BELC	LINE-PCF	ABOVE	BELOW	ABOVE	BELOW	ABOVE	BELOW			
1	1018.00	1180.00	1084.00	1134.00	120.0	0.00	26.00	0.0	700.0	0.000	0.000	0	0	0	
2	1084.00	1134.00	1100.00	1120.00	120.0	0.00	26.00	0.0	700.0	0.000	0.000	0	0	0	
3	1100.00	1120.00	1104.00	1120.00	120.0	0.00	26.00	0.0	700.0	0.000	0.000	0	0	0	
4	1104.00	1120.00	1120.00	1120.00	98.0	0.00	26.00	0.0	350.0	0.000	0.000	0	0	0	
5	1120.00	1120.00	1232.00	1040.00	98.0	0.00	26.00	0.0	350.0	0.000	0.000	0	0	0	
6	1104.00	1120.00	1220.00	1042.00	120.0	26.00	26.00	350.0	700.0	0.000	0.000	0	0	0	

NOTE: IF (NEW.UED.1) SOIL IS NEWLY PLACED AND DOES NOT CONSOLIDATE LAYERS WITH MUU=1
 IF (MUU.UED.1) SOIL WILL BE LOADED UNDER UNDEVELOPED CONDITIONS BY NEWLY PLACED LAYERS
 VALUES MARKED WITH ** ARE C/P RATIOS FOR LAYERS WITH MUU=1

UNIT WEIGHT OF WATER = 62.40 NUMBER OF COLUMN LOADS = 0
 MODE OF PROGRAM OPERATION = 3
 CENTER VARIATIONS MIN-X MAX-X MIN-Y MAX-Y DX DY
 1240.00 1240.00 1250.00 1280.00 10.00 10.00
 RADIUS TANGENTS MAX= 1058.00 MIN= 1042.00 INCR= 1.00
 RESULTS

INTR NO	RAD	CENTER COORDINATES	CIRCLE	FACTOR OF SAFETY	SUMMS	SUM1	SUM2	XR	XL	ARC	NN	TRIAL
NO	NO60.24	170.08	2									

STRMS
 SRDYS
 EDIT.OLD.GMB
 UNIEDIT 3.32 READY ? WIDTH=132/%FINDI/TABUL/%P.118
 TABULATION OF MINIMUM SAFETY FACTORS
 (CRITICAL RADIUS IN PARENTHESES)

Y COORDINATES	X COORDINATES		
	1240.0	1250.0	1260.0
1280.0	1.802 (222.)	2.111 (222.)	2.024 (219.)
1270.0	1.877 (212.)	2.034 (212.)	2.108 (210.)
1260.0	1.953 (202.)	2.114 (202.)	2.045 (202.)
1250.0	1.954 (191.)	2.084 (188.)	2.575 (192.)

Y COORDINATES	X COORDINATES							
	1210.0	1215.0	1220.0	1225.0	1230.0	1235.0	1240.0	
1310.0	1.534 (240.)	1.504 (244.)	1.478 (246.)	1.451 (252.)	1.495 (252.)	1.549 (252.)	1.617 (252.)	
1305.0	1.512 (237.)	1.484 (241.)	1.431 (247.)	1.447 (247.)	1.515 (247.)	1.569 (247.)	1.644 (247.)	
1300.0	1.442 (236.)	1.440 (240.)	1.445 (242.)	1.485 (242.)	1.531 (242.)	1.594 (242.)	1.672 (242.)	
1295.0	1.449 (233.)	1.427 (237.)	1.440 (237.)	1.501 (237.)	1.552 (237.)	1.619 (237.)	1.701 (237.)	
1290.0	1.437 (230.)	1.441 (232.)	1.477 (232.)	1.518 (232.)	1.575 (232.)	1.643 (232.)	1.734 (232.)	
1285.0	1.424 (227.)	1.456 (227.)	1.491 (227.)	1.538 (227.)	1.595 (227.)	1.670 (227.)	1.746 (227.)	
1280.0	1.440 (222.)	1.471 (222.)	1.509 (222.)	1.554 (222.)	1.618 (222.)	1.699 (222.)	1.802 (222.)	
1275.0	1.435 (217.)	1.485 (217.)	1.528 (217.)	1.577 (217.)	1.645 (217.)	1.727 (217.)	1.834 (217.)	
1270.0	1.448 (212.)	1.503 (212.)	1.545 (212.)	1.600 (212.)	1.669 (212.)	1.759 (212.)	1.877 (212.)	

READY ? END
 SRDY-FDRS
 BYE
 CT = 00.23 SU-A = 1.9
 KCM = 7
 0034008 LOG OFF. 19.04.00.

TABULATION OF MINIMUM SAFETY FACTORS
 (CRITICAL RADIUS IN PARENTHESES)

Y COORDINATES	X COORDINATES				
	1140.0	1145.0	1150.0	1155.0	1160.0
1180.0	2.423 (82.)	2.475 (82.)	3.043 (82.)	3.249 (81.)	2.729 (80.)
1175.0	2.534 (77.)	2.819 (77.)	3.242 (77.)	2.883 (73.)	2.744 (75.)
1170.0	2.642 (72.)	2.982 (72.)	3.294 (70.)	2.867 (68.)	2.694 (71.)
1165.0	2.811 (67.)	3.167 (67.)	3.041 (67.)	2.703 (64.)	2.479 (67.)
1160.0	2.984 (62.)	3.235 (60.)	2.997 (62.)	2.545 (60.)	2.319 (62.)

TABULATION OF MINIMUM SAFETY FACTORS
 (CRITICAL RADIUS IN PARENTHESES)

Y COORDINATES	X COORDINATES				
	1120.0	1125.0	1130.0	1135.0	1140.0
1180.0	3.342 (82.)	2.219 (78.)	2.144 (82.)	2.260 (82.)	2.425 (82.)
1175.0	3.061 (77.)	2.173 (74.)	2.225 (77.)	2.352 (77.)	2.534 (77.)
1170.0	2.181 (71.)	2.220 (72.)	2.315 (71.)	2.454 (72.)	2.642 (72.)
1165.0	2.241 (67.)	2.314 (67.)	2.421 (67.)	2.577 (67.)	2.811 (67.)
1160.0	2.344 (62.)	2.425 (62.)	2.543 (62.)	2.718 (62.)	2.954 (62.)



December 29, 1980

Mr. Wendell Owen
CO-OP Mining Company
Box 300
Huntington, Utah 84528

Dear Mr. Owen:

Report
Geotechnical Consultation
Bear Creek Portal
Near Huntington, Utah
For CO-OP Mining Company

INTRODUCTION

The purpose of this report is to discuss the stability of side-cast fill material placed during construction of the access road to the CO-OP Mining Company Bear Creek Portal. The scope of our consultation was formulated in discussions with Mr. Owen and consisted of a brief field reconnaissance, collection of a sample of the fill material, limited laboratory testing and preparation of this report.

The Bear Creek Portal is located in the SW 1/4, SW 1/4, S. 24, T. 16S., R. 7E., Emery County. Several abandoned facilities from a previous mining effort exist near the Portal. We understand that the CO-OP Mining Company is in the process of re-opening the old mine and that the existing old Portal will be used for ventilation of the new mine. The mine is located in a steep slope in the Wasatch Plateau; access to the Portal is by a typical unsurfaced access road constructed by conventional side-cast methods.

Appendix 3-F (cont.)

5/10/85

STABILITY ANALYSES

Highwall Stability

Highwalls at the site face south, southeast, and east. The highwalls are nearly vertical, with an average slope of 1V:.2H, or 80°.

The highwall stability analysis is based on a rotational shear analysis using the Hoek method. Compressive strengths of materials in the Blackhawk Formation are highly variable, ranging from 290 PSI for soft shale to more than 20,000 PSI for certain sandstones. An average value of 5,000 PSI has been used for this analysis. This is a very conservative figure, based on the relative proportions of sandstones and shales in the exposed highwalls.

There are 2 joint sets typically found in this area. The major set has a strike of about N 10° E and dips 80° to vertical. The minor set has a strike of approximately N 70° W and also dips greater than 80°. The bedding in the highwall area is nearly flat.

Cohesion can be calculated from compressive strength by the following formula:

$$C_i = \frac{C_o}{2} \tan(45 - \frac{\theta}{2});$$

where:

C_i = Intact rock shear strength or cohesion

C_o = Intact rock compressive strength

θ = Internal friction angle.

Using a typical internal friction angle of 45° for Wasatch Plateau rock types, and a 5,000 PSI compressive strength, a cohesion or intact rock strength of approximately 1,000 PSI is found. Since the 1,000 PSI value is for intact or solid rock, the value must be adjusted to compensate for jointing and fracturing common to all rock masses. A method of relating fracture intensity and cohesion was developed by Stimpson and Ross-Brown and can be found in the article entitled, "Estimating the Cohesive Strength of Randomly Jointed Rock Masses", Mining Engineering, Vol. 31, No. 2, pp. 182-188. Based on this method and using a conservative figure of 4 joints per meter, a .065 factor is determined for calculating C_m or rock mass cohesion. Based on a C_i of 1,000 PSI, C_m becomes 65 PSI.

A typical or average rock mass bulk density of 155 lbs./ft.³ was selected for the analysis, and a slightly conservative, but commonly used value of 31° was selected for the rock mass sliding friction angle.

The following parameters were used with the Hoek slope chart (Hoek, E., and J. W. Bray, 1981, Rock Slope Engineering, Revised Third Edition, IMM, London):

H = Maximum Slope Height - 100'

θ = Slope Angle (average) - 80°

C_m = Rock Mass Cohesion - 65 PSI

ϕ = Rock Mass Friction Angle - 31°

Υ = Rock Mass Bulk Density - 155 lbs./ft.³

Plotting the above parameters on the Circular Failure Charts Nos. 1 and 5, it can be seen that the projected highwalls will have a safety factor of 2.61 under dry conditions and 2.40 under saturated conditions. It should be noted that the safety factors exceed the required 1.5 safety factor.

Embankment Stability

Embankment or backfill will be placed in lifts not to exceed 36" and will be compacted to 90% of the laboratory obtained T-99 Standard Proctor. Slopes will not exceed 1V:1.5H or 33.7°. Soil properties are based on those used in the "Slope Stability Analyses for the Bear Creek Portal and Access Road", by Dames and Moore, February 20, 1981, and the "Geotechnical Consultation, Bear Creek Portal", by Dames and Moore, December 29, 1980, and the "Bear Creek Canyon Mine Site, Sedimentation Pond "A" Stability Analysis", by Horrocks and Corollo Engineers on July 12, 1984.

Based on the proposed plan, and the results of samples taken during the above studies, the following parameters were established for the safety factor calculations:

- (1) H = Embankment Height = 30'; this represents the maximum height of compacted embankment proposed in the plan;
- (2) θ = Slope Angle = 33.7° ; this is the maximum slope (1V:1.5H) proposed for the reclaimed embankments;
- (3) C_m = Soil Cohesion @ 90% Compaction = 4.375 PSI; Actual Cohesion tests on compacted native material at this site showed a cohesion value of 700 PSF at a density of 118 lbs./ft.³ and a compaction value ranging from 89% to 94%. (See Sediment Pond "A" Stability Analysis", by Horrocks & Corollo Engineers, July 12, 1984.) To provide for maximum safety in the calculation, the cohesion factor is reduced by the compaction factor.
 $700 \text{ pfs} \times 0.9 = 630 \text{ psf} = 4.375 \text{ psi};$
- (4) ϕ = Friction Angle = 26° ; This angle is based on the measurements taken and reported in the Feb. 20, 1981 Dames & Moore Slope Stability Analysis on the Bear Creek Portal and Access Road;
- (5) γ = Rock Mass Bulk Density (90%) = 108 lbs/ft.³; Once again, this is a conservative number, established by taking actual values of 118 to 120 lbs./ft.³ as reported in the above reference stability analysis,

and allowing for 90% compaction - $120 \times 0.90 = 108 \text{ lbs./ft.}^3$.

A rotational shear analysis was performed using the Hoek method to determine stability of the backfilled slopes. The following parameters were used for the slopes:

H = Embankment Height - 30'

θ = Slope Angle - 33.7°

C_m = Soil Cohesion @ 90% Compaction - 4.375 psi

ϕ = Friction Angle - 26°

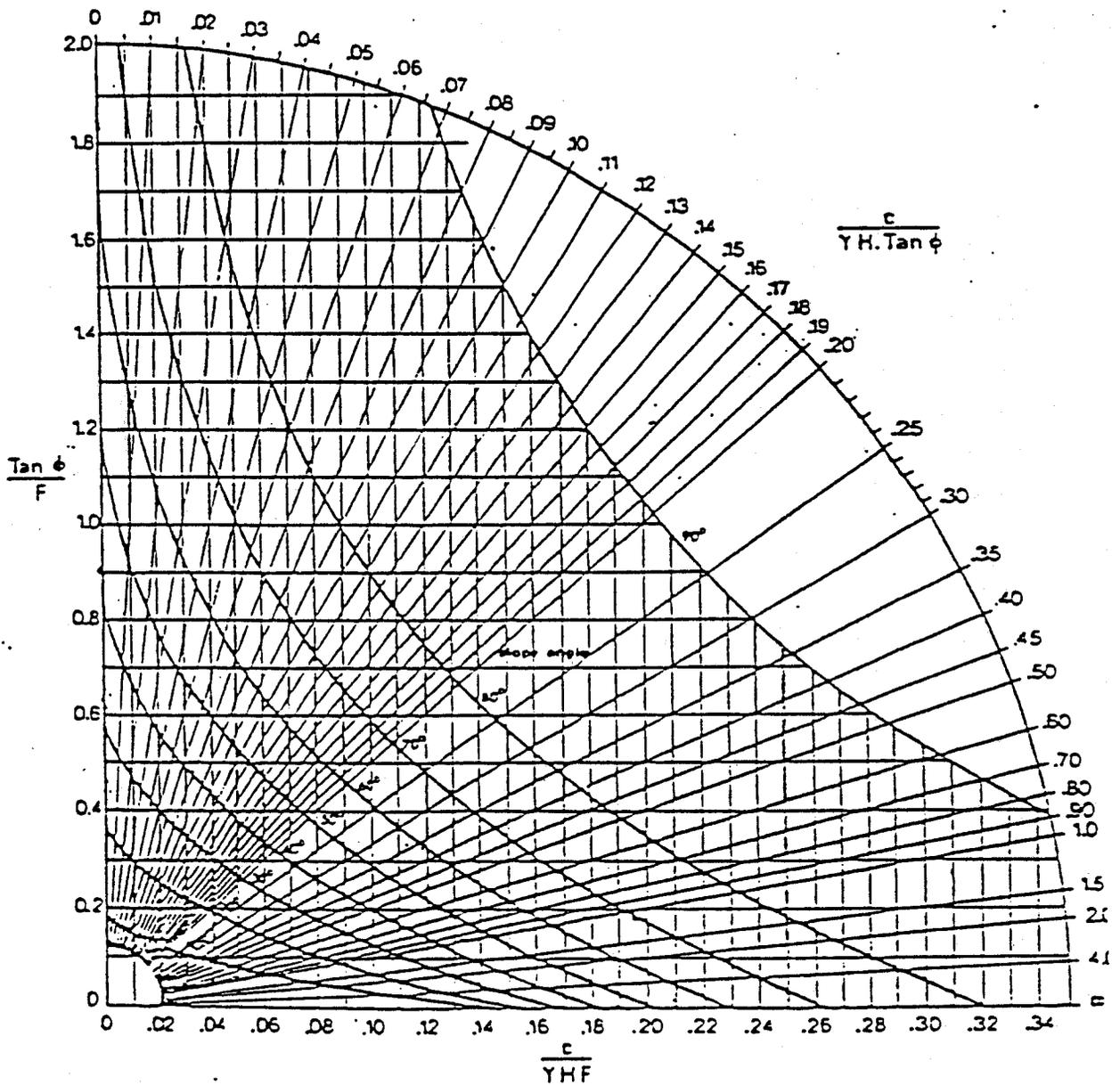
I = Rock Mass Bulk Density (90%) - 108 lbs./ft.^3

Based on the above criteria, backfilled slopes are found to have an expected safety factor of a maximum of 2.21 for dry conditions to a minimum of 1.68 for saturated conditions. Both cases exceed the required static safety factor of 1.3. It should also be noted that the previous slope stability analyses by Dames & Moore resulted in static safety factors ranging from a minimum of 1.43 to 2.15 for side-cast cut and fill material in this area.

Note: The embankment compaction factors and cohesion values are based on previous tests performed in the Bear Canyon area. Although the tests were not site specific, they were run on the existing soils which are the same as those to be used in reclamation. The values used for rock compressive strengths were taken from rock parameters typical of the Blackhawk Formation in the Wasatch Plateau, and commonly used and accepted for this type of calculations.

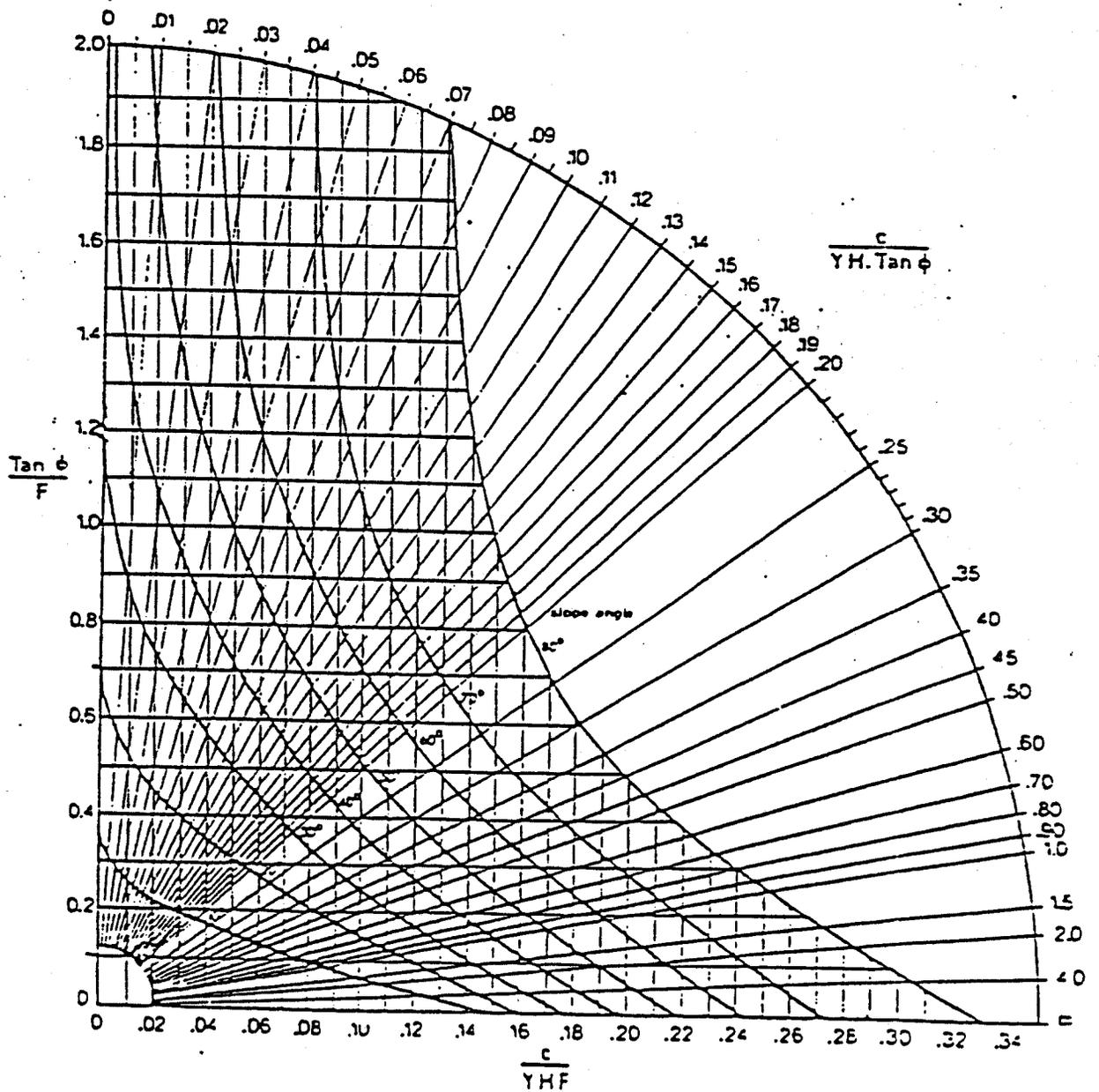
(DRY CONDITIONS)

CIRCULAR FAILURE CHART NUMBER 1



(SATURATED CONDITIONS)

CIRCULAR FAILURE CHART NUMBER 5



If it is determined necessary, Co-Op will commit to taking site specific tests on the soils and highwall rock to further verify the factors of safety. These tests would be performed prior to reclamation, or at the discretion of the Division.

Removal or Reduction of Highwalls

The highwalls will be reduced along the pad and road areas where feasible. This will be accomplished by recovering material from the edge of pad and road fill areas with a backhoe and placing it against the base of the highwall. The material will be compacted with a cat to promote stability of the backfill. Erosion controls, such as straw dikes or water bars, will be placed below the backfilled areas to minimize washing of the fill material. The backfill material is native, consisting of material originally generated from the construction of the highwall areas and compacted into the road or pad fill areas.

Complete rick highwalls will be left in some areas to lessen the probability of erosion on backfilled materials or to minimize the amount of additional disturbance that would result from highwall reduction (see Plate 3-2).

The rationale for leaving or reducing the highwalls is based on the following:

1. Natural cliffs are common in the Blackhawk Formation, and in this area. The highwalls proposed to be left are similar in height and exposure to existing cliffs in the area and will therefore be compatible with existing topography.
2. The highwalls will provide habitat for cliff-dwelling wildlife, and the pad areas will provide for other wildlife grazing. This proposal is therefore compatible with the post-mining land use of wildlife habitat;
3. The rock highwalls could be partially shot down; however, this would extend the disturbance further up the steep slopes, resulting in more exposure and erosion potential;
4. The proposed highwalls to be left or reduced are on the south facing slopes in the area. These are the steeper slopes in the area, as well as the slopes more commonly containing rock exposures similar to the proposed highwalls
5. The fill areas at the base of the highwalls will be stabilized by reseeding and the use of erosion controls as discussed earlier. The toe of these areas will be terraces or gentle slopes (less than 10%) adding to their stability. These will eventually take the appearance of "talus slopes" a common structure at the base of exposed cliffs in this area. The natural weathering of cliffs and highwalls

will be very similar, providing for a further compatibility with the geomorphic processes of the area.

6. The existing (and proposed) highwalls will be stable. There are no seeps known to exist in any areas where highwalls are proposed to be left. The stability analysis run on this site show the highwalls of the pad and road areas to have a static safety factor of 2.61 for dry conditions and a factor of 2.41 for saturated conditions. Each of these far exceed the 1.3 safety factor required for highwalls proposed to be left or reduced. (Details on the stability analysis are included in the next section).

BY D. Guy DATE 8/15/85 SUBJECT Highwall Lithologic Section SHEET NO. OF.....

CHKD. BY DATE JOB NO.

Scale: 1"=20'

