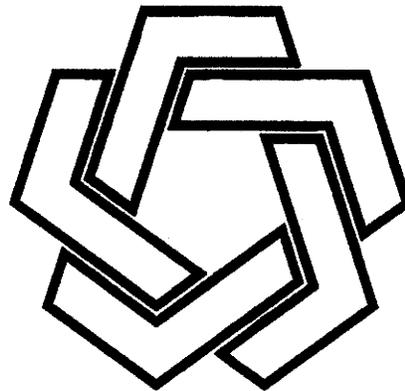


STATE DECISION PACKAGE

Co-Op Mining Company Bear Canyon Mine Fee Lease Addition

PERMIT

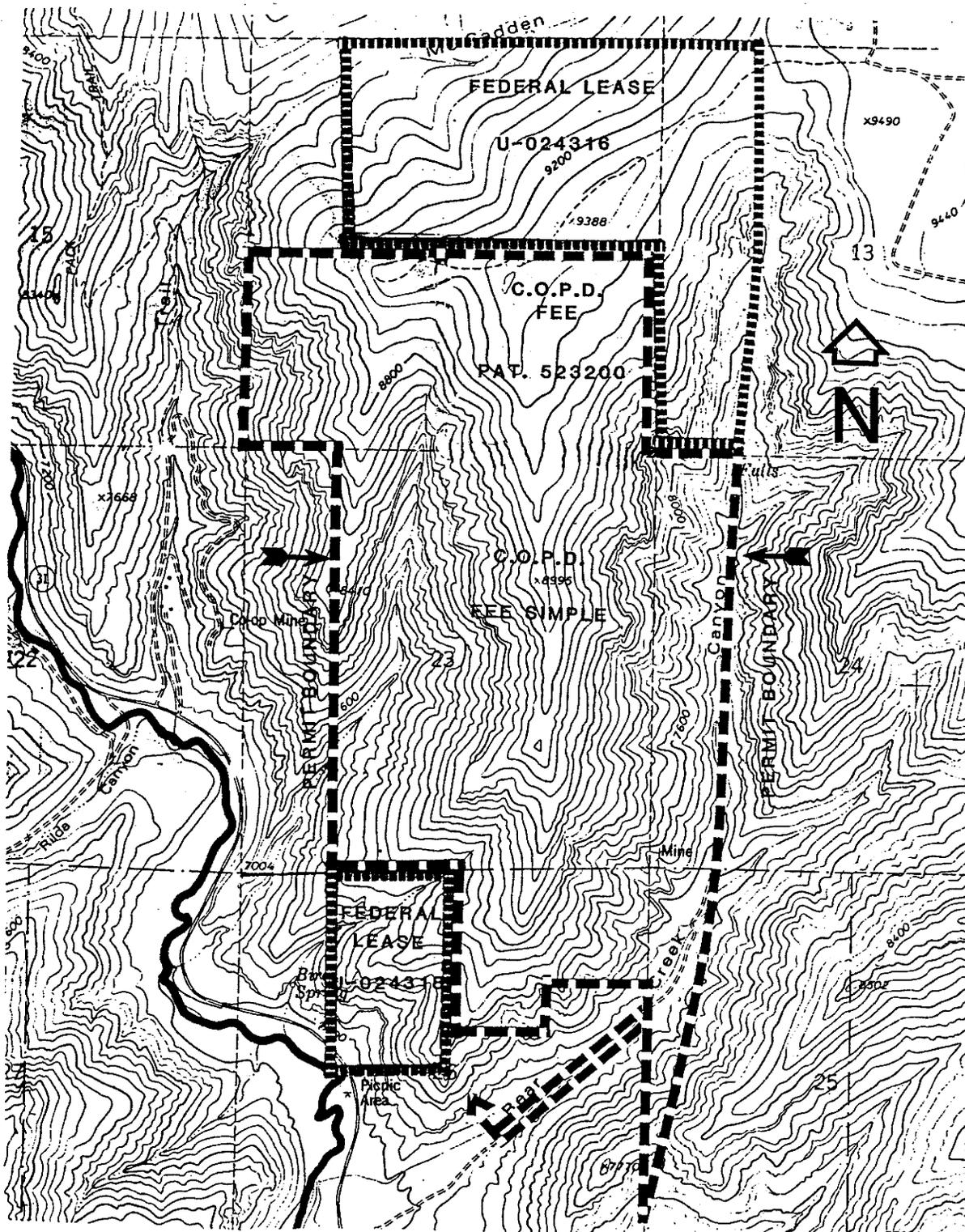


**STATE OF UTAH
Department of Natural Resources
Division of Oil, Gas & Mining**

AUGUST 11, 1989

CO-OP MINING COMPANY

BEAR CANYON MINE



(Township 16 South, Range 7 East SLBM)

SCALE 1":24000'

UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT AND
TECHNICAL ANALYSIS

Co-OP Mining Company
Bear Canyon Mine
Fee Lease Addition

ACT/015/025
Emery County, Utah
August 11, 1989

CONTENTS

- * Administrative Overview
- * Location Map
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- * Cumulative Hydrologic Impact Assessment (CHIA)
- * Letters of Concurrence
- * Affidavit of Publication
- * Reclamation and Bonding Agreement

AT102/2

**ADMINISTRATIVE OVERVIEW
CO-OP MINING COMPANY
BEAR CANYON MINE
Fee Lease Addition
ACT/015/025**

**Emery County, Utah
August 11, 1989**

BACKGROUND

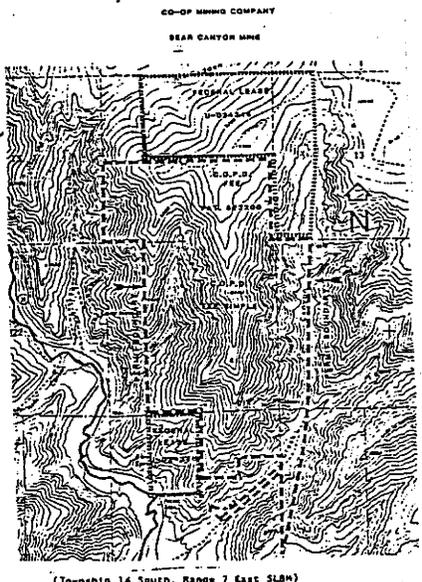
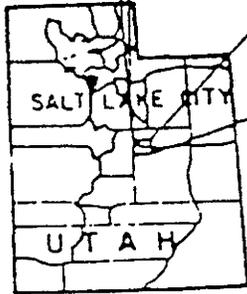
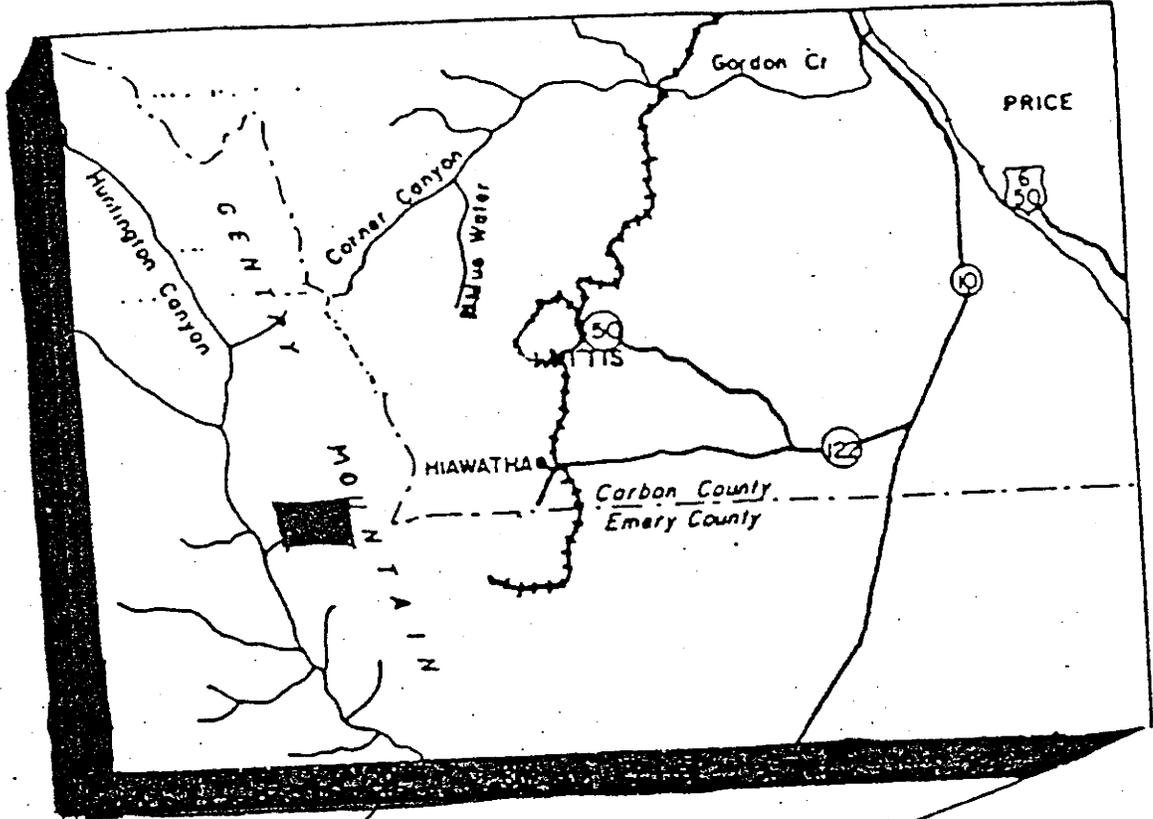
The Co-Op Mining Company's Bear Canyon Mine received a permanent program permit under the requirements of UCA 40-10 et seq on November 1, 1985. A permit revision to incorporate mining of the Hiawatha Seam was approved June 12, 1987. A request to mine 160 additional acres (fee lease) was submitted to the Division in January, 1988.

RECOMMENDATIONS FOR APPROVAL

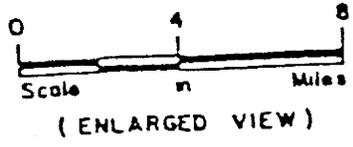
There were no major issues identified in the permit review or during the public comment period. The mining of 160 additional acres within the permit area is in accord with Utah's requirements under UCA 40-10 and UMC regulations.

Based on the technical analysis and CHIA compiled by the Division, all necessary findings can be made to approve this action.

It is recommended that the fee lease addition revision be approved with the stipulations noted in the permit.



(Township 16 South, Range 7 East SLB) SCALE 1"=24000'



LOCATION MAP

CO-OP MINING COMPANY
EMERY COUNTY

CHRONOLOGY
CO-OP MINING COMPANY
BEAR CANYON MINE
Fee Lease Addition
ACT/015/025

Emery County, Utah
August 11, 1989

Permanent Program Permit:

March 20, 1981	Division grants interim permit to Bear Canyon Mine.
December 10, 1981	Division completes Apparent Completeness Review (ACR).
July 29, 1982	Co-Op response to ACR.
February 4, 1983	Division completes second ACR.
April 4, 1983	Co-Op response to second ACR.
May 12, 1983	Division reviews and replies to Co-Op submittal.
July 29, 1983	Co-Op response to latest Division review.
September 2, 1983	Division responds to Co-Op submittal.
October 28, 1983	Co-Op addresses completeness deficiency issues.
March 30, 1984	Division mails to Co-Op list of outstanding completeness issues.
April 30, 1984	Co-Op responds to completeness issues.
May 11, 1984	Division responds to Co-Op submission.
May 29, 1984	Division mails Co-Op a list of completeness deficiencies.
June 25, 1984	Co-Op submits completeness deficiency response.
July 13, 1984	Division responds to latest Co-Op submission.
August 20, 1984	Co-Op provides complete and adequate response to completeness deficiencies.
October 2, 1984	Division issues Determination of Completeness.

Chronology
Co-Op Mining Company
Bear Canyon Mine
ACT/015/025
August 11, 1989

- October 31, 1984 Co-Op publishes its Intent to File Permit Application Package (PAP).
- January 11, 1985 Division notifies Co-Op of technical deficiencies.
- February 13, 1985 Co-Op provides technical deficiency response.
- April 15, 1985 Division completes draft Technical Analysis (TA). Mails draft TA to Co-Op.
- May 17, 1985 Bear Canyon responds to Division's draft TA.
- July 25, 1985 Division sends Co-Op list of outstanding technical deficiencies.
- August 26, 1985 Co-Op responds to technical deficiencies.
- October 30, 1985 Division completes final TA.
- November 1, 1985 Division issues Mining and Reclamation Permit (MRP).
- November 6, 1985 Division notifies state and federal agencies of MRP approval.

Hiawatha Seam Revision:

- January 3, 1986 DOGM receives initial application for the Hiawatha Seam Revision.
- February 18, 1986 DOGM transmits completeness deficiencies and technical deficiencies to applicant.
- March 27, 1986 Co-Op Mining Company submits response to completeness and technical deficiencies.
- May 9, 1986 DOGM transmits completeness and technical deficiencies still outstanding to Co-Op.
- July 14, 1986 Co-Op responds to May 9, 1986 letter.

Chronology
Co-Op Mining Company
Bear Canyon Mine
ACT/015/025
August 11, 1989

Hiawatha Seam Revision: (Cont'd.)

- September 9, 1986 DOGM transmits remaining completeness and technical deficiency items to Co-Op.
- October 3, 1986 Co-Op requests partial approval of application to construct surface facilities attendant to the Hiawatha seam production as an amendment to the currently approved Bear Canyon Mine.
- October 15, 1986 DOGM issues approval of surface facilities amendment October 3, 1986.
- February 2, 1987 Co-Op submits in-mine borehole information to address DOGM letter of September 9, 1986.
- March 19, 1987 DOGM determines the application administratively complete and advises Co-Op to publish pursuant to UMC 786.11.
- May 12, 1987 Co-Op completes publication in the Emery County Progress. Publication dates were April 21, 18, and May 5 and 12 (Section 26 was omitted inadvertently from this publication notice).
- June 12, 1987 Division issues revision with condition that public notice requirements be fulfilled for Section 26 prior to any working in that portion of the Hiawatha Seam.

Fee Lease Addition:

- January 22, 1988 Co-Op submits documents pertaining to the fee lease to the Division.
- February 1, 1988 Co-Op submits fee lease addition application to the Division.
- February 2, 1988 Division requests Co-Op to resubmit fee lease application in an acceptable format.
- February 11, 1988 Co-Op resubmits fee lease addition application.

Chronology
Co-Op Mining Company
Bear Canyon Mine
ACT/015/025
August 11, 1989

Fee Lease Addition: (Cont'd.)

February 23, 1988 Division distributes fee lease application to appropriate agencies.

March 24, 1988 Division sends first ICR comments to Co-Op.

August 10, 1988 Co-Op responds to Division ICR comments.

September 14, 1988 Division sends second ICR comments to Co-Op.

January 30, 1989 Co-Op responds to second Division ICR comments.

February 7, 1989 Co-Op addresses completeness deficiency issues.

March 15, 1989 Division issues Determination of Completeness for Bear Canyon Mine fee lease.

April 12, 1989 Recompiled Bear Canyon Mine Permit (PAP) that incorporates materials related to the Fee Lease Addition sent to appropriate agencies by Division.

August 11, 1989 Division issues permit for Bear Canyon Mine Fee Lease Addition.

djh
AT102/12-15

MINE PLAN INFORMATION

Mine Name Bear Canyon Mine State ID: ACT/015/025
 Operator Co-Op Mining Company County: Emery
 Controlled By Co-Op Mining Company
 Contact Person(s) Nathan Atwood Position: _____
 Telephone: (801) 748-5238
 New/Existing Existing Mining Method Room and Pillar

Federal Lease No.(s) _____
 Legal Description(s) _____:

State Lease No.(s) None
 Legal Description(s) _____

Other Leases (identify) COP Development Fee Simple

Legal Descriptions Township 16 South, Range 7 East, SLBM, S1/2 Section 14; E1/2, E1/2 NW1/4 E1/2 SW1/4, Section 23; all land in Section 24 and 25 West of the NS Trending Bear Canyon Fault Line; and NE1/4 NE1/4, NW1/4 NE1/4 and N1/2 SW1/4 NE1/4, Section 26, and the access/haul road and topsoil storage area as shown on Plate 2-1 of the PAP.

Ownership Data: For _____

Surface Resources (acres)	Existing Permit Area	Proposed Permit Area	Total Life of Mine Area
Federal	_____	_____	_____
State	_____	-----	1051
Private	_____	_____	_____
Other	_____	-----	1051
TOTAL	_____	_____	_____

Coal Ownership (Acres)

Federal	_____	_____	_____
State	_____	_____	1051
Private	_____	_____	_____
Other	_____	-----	1051
TOTAL	_____	_____	_____

<u>Coal Resource Data</u>	<u>*Total Reserves</u>	<u>Total Recoverable Reserves</u>
Federal	0	* 0
State	0	0
Private	24,219,300	14,531,600
Other		
TOTAL	24,219,300	14,531,600

*92,500 tons of unpermitted and unleased federal coal were mined in 1985. See letter to Division from BLM dated October 24, 1985.

Recoverable Reserve Data

	<u>Name</u>	<u>Thickness</u>	<u>Depth</u>
Seam	Bear Canyon	10 ft	200-1,800 ft
Seam	Hiawatha	5 ft	250-1,850 ft
Seam			

Mine Life 50 years
 Average Annual Production 300,000 tons/yr Percent Recovery 60%
 Date Projected Annual Rate Reached Presently
 Date Production Begins Currently producing Date Production Ends 2030
 Reserves Recoverable by: (1) Surface Mining _____
 (2) Underground Mining 14,531,600
 Reserves Lost Through Management Decision Unknown
 Coal Market Lump coal, Steam coal, Utah and Western United States

Permit Changes That Have Been Approved:

<u>Amendments:</u>	<u>Date</u>
Topsoil Consolidation	8/17/83
Scalehouse Area Modification	10/12/83
Incidental Boundary Change	8/24/84
Reconstruction of Sedimentation Pond A	12/5/84
Truck Loading Conveyor	6/11/85
Surface Facilities for Hiawatha Seam	10/15/86
Mine Sequence Changes; Portal Additions	12/15/86
Minor Disturbed Area Drainage Changes	1/30/87
Water Monitoring Changes	2/11/88
Incidental Boundary Change (8.5 Acres)	4/4/88
Hydrologic Design Changes	9/9/88
Lump Coal Storage	10/5/88
Emergency Escapeway and Ventilation Portal	12/13/88
Hiawatha As-Built Changes	1/27/89
Alternative Sediment Control Areas	3/15/89
Point Source Discharge	4/12/89
Sedimentation Pond Cleanout	5/4/89
Culvert Extension	7/14/89
REVISIONS:	
Hiawatha Seam	7/2/87

FINDINGS

Co-Op Mining Company
Bear Canyon Mine
Fee Lease Addition
ACT/015/025
Emery County, Utah
August 11, 1989

1. The plan and the permit application are accurate and complete and all requirements of the Surface Mining Control and Reclamation Act (the "Act"), and the approved Utah State Program have been complied with (UMC 786.19[a]).
2. The applicant proposes acceptable practices for the reclamation of disturbed lands (PAP Chapter 4). These practices have been shown to be effective in the short-term; there are no long-term reclamation records utilizing native species in the western United States. Nevertheless, the Division has determined that reclamation, as required by the Act, can be feasibly accomplished under the Permit Application Package (PAP) (UMC 786.19[b]) (see Technical Analysis (TA) Section UMC 817.111-.117).
3. The assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been made by the Division. The Operation and Reclamation Plan proposed under the application has been designed to prevent damage to the hydrologic balance in the permit area (UMC 786.19[c] and UCA 40-10-11[2][c]). (See Wildcat Loadout Facility Cumulative Hydrologic Impact Analysis [CHIA].)
4. The proposed lands to be included within the permit area are:
 - a. not included within an area designated unsuitable for underground coal mining operations;
 - b. not within an area under study for designated lands unsuitable for underground coal mining operations;
 - c. not on any lands subject to the prohibitions or limitations of 30 CFR 761.11[a] (national parks, etc.), 761.11[f] (public buildings, etc.) and 761.11[g] (cemeteries);
 - d. within 100 feet of a public road; however, the road was used as a coal haul road by the applicant prior to August 3, 1977, and is therefore subject to a valid existing right (UMC 761.11);

Findings
Bear Canyon Mine

- e. not within 300 feet of any occupied dwelling (UMC 786.19[d]).
- 5. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (UMC 786.19[e]).
- 6. The applicant has the legal right to enter and complete mining and reclamation activities in the permit area (UMC 786.19[f]).
- 7. A 510(c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; Co-Op Mining Company is not delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with a demonstrated pattern of wilfull violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19[g], [h] [i] ; {OSMRE Relatedness Report, re-verified August 1, 1989}).
- 8. Coal mining and reclamation operations to be performed under the permit will not be inconsistent with other operations anticipated to be performed in areas adjacent to the proposed permit area (UMC 786.19[j]).
- 9. A detailed analysis of the proposed bond has been made. The bond estimate is \$285,067.00. The Division has made appropriate adjustments to reflect costs which would be incurred by the state, if it was required to contract the final reclamation activities for the mine site. The bond was posted on December 2, 1988, and made payable to the Division of Oil, Gas and Mining (UMC 786.19[k]).
- 10. The applicant has satisfied the requirements for alluvial valley floors and prime farmlands (UMC 786.19[l]). (See TA Section UMC 785.19 and 828.00.)
- 11. The proposed postmining land-use of the permit area has been approved by the Division (UMC 786.19[m]). (See TA, Section UMC 817.133.)

Findings
Bear Canyon Mine

12. The Division has made all specific approvals required by the Act, the Cooperative Agreement and the Federal Lands Program (UMC 786.19[n]).
13. The proposed operation will not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats (UMC 786.19[o]). (See TA UMC 817.97)
14. All procedures for public participation required by the Act, and the approved Utah State Program have been compiled with (UMC 786.11-.15).
15. The applicant proposes to use existing structures in connection with the proposed underground coal mining activities. These structures meet the performance standards of the Act and subchapter K and pose no significant harm to the environment or public health or safety (UMC 786.21) (see TA Section UMC 817.181).

Richard V. Smith

Permit Supervisor

Shaw P. Bryant

Associate Director, Mining

Daniel R. Nelson

Director

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
(801) 538-5340

This permit, ACT/015/025, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (DOGM) to:

Co-Op Mining Company
53 West Angelo Avenue
Salt Lake City, Utah 84115
(801) 486-1458

for the Bear Canyon Mine. Co-Op Mining Company is the owner of certain fee-owned parcels. A performance bond is filed with the DOGM in the amount of \$285,067.00, payable to the state of Utah, Division of Oil, Gas and Mining. DOGM must receive a copy of this permit signed and dated by the permittee.

- Sec. 1 **STATUTES AND REGULATIONS** - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as the Act.
- Sec. 2 **PERMIT AREA** - The permittee is authorized to conduct underground coal mining activities on the following described lands (as shown on the map appended as Attachment A) within the permit area at the Bear Canyon Mine, situated in the state of Utah, Emery County, and located:

Township 16 South, Range 7 East, SLBM

- | | |
|-------------|---|
| Section 14: | S1/2 |
| Section 23: | E1/2, E1/2 NW1/4, E1/2 SW1/4 |
| Section 24: | All land West of North-South Trending Bear Canyon Fault |
| Section 25: | All land West of North-South Trending Bear Canyon Fault |
| Section 26: | NE1/4 NE1/4, NW1/4 NE1/4, N1/2 SW1/4 NE1/4 and the access/haul road and topsoil storage area as shown on Plate 2-1 of the Mining and Reclamation Plan |

This legal description is for the permit area (as shown on Attachment A) of the Bear Canyon Mine. The permittee is authorized to conduct underground coal mining activities and related surface activities on the foregoing described property subject to the conditions of all applicable conditions, laws and regulations.

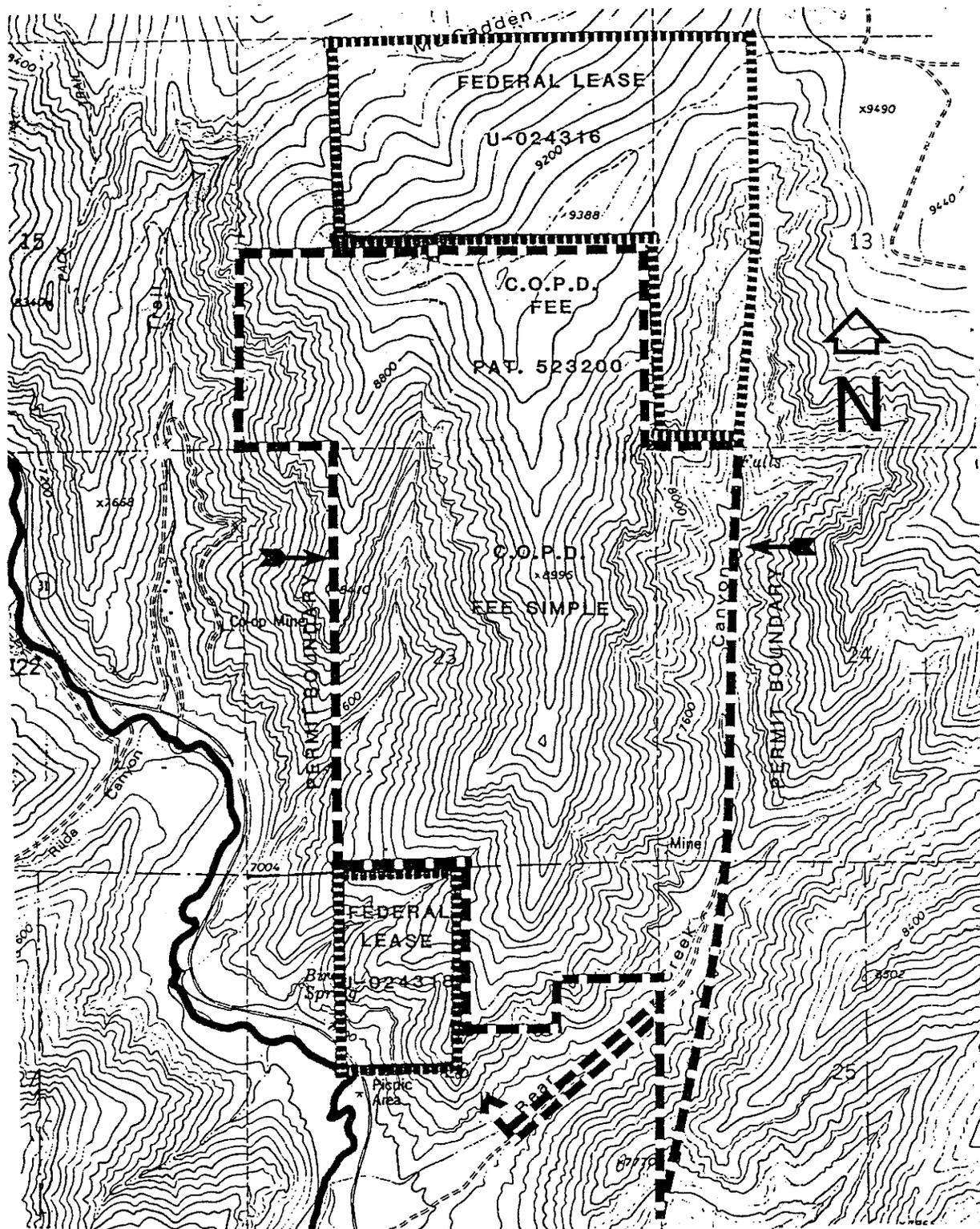
- Sec. 3 PERMIT TERM - This permit becomes effective on August 11, 1989 and expires on November 1, 1990.
- Sec. 4 ASSIGNMENT OF PERMIT RIGHTS - The permit rights may not be transferred, assigned or sold without the approval of the Director, DOGM. Transfer, assignment or sale of permit rights must be done in accordance with applicable regulations, including but not limited to 30 CFR 740.13(e) and UMC 788.17-.19.
- Sec. 5 RIGHT OF ENTRY - The permittee shall allow the authorized representative of the DOGM, including but not limited to inspectors, and representatives of OSMRE, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay to:
- A. have the rights of entry provided for in 30 CFR 840.12, UMC 840.12, 30 CFR 842.13 and UMC 842.13; and
 - B. be accompanied by private persons for the purpose of conducting an inspection in accordance with UMC 842.12 and 30 CFR 842, when the inspection is in response to an alleged violation reported by the private person.
- Sec. 6 SCOPE OF OPERATIONS - The permittee shall conduct underground coal mining activities only on those lands specifically designated as within the permit area on the maps submitted in the mining and reclamation plan and permit application and approved for the term of the permit and which are subject to the performance bond.
- Sec. 7 ENVIRONMENTAL IMPACTS - The permittee shall minimize any adverse impact to the environment or public health and safety through but not limited to:
- A. accelerated monitoring to determine the nature and extent of noncompliance and the results of the noncompliance;

- B. immediate implementation of measures necessary to comply; and
 - C. warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.
- Sec. 8 **DISPOSAL OF POLLUTANTS** - The permittee shall dispose of solids, sludge, filter backwash or pollutants in the course of treatment or control of waters or emissions to the air in the manner required by the approved Utah State Program and the Federal Lands Program which prevents violation of any applicable state or federal law.
- Sec. 9 **CONDUCT OF OPERATIONS** - The permittee shall conduct its operations:
- A. in accordance with the terms of the permit to prevent significant, imminent environmental harm to the health and safety of the public; and
 - B. utilizing methods specified as conditions of the permit by DOGM in approving alternative methods of compliance with the performance standards of the Act, the approved Utah State Program and the Federal Lands Program.
- Sec. 10 **AUTHORIZED AGENT** - The permittee shall provide the names, addresses and telephone numbers of persons responsible for operations under the permit to whom notices and orders are to be delivered.
- Sec. 11 **COMPLIANCE WITH OTHER LAWS** - The permittee shall comply with the provisions of the Water Pollution Control Act (33 USC 1151 et seq,) and the Clean Air Act (42 USC 7401 et seq), UCA 26-11-1 et seq, and UCA 26-13-1 et seq.
- Sec. 12 **PERMIT RENEWAL** - Upon expiration, this permit may be renewed for areas within the boundaries of the existing permit in accordance with the Act, the approved Utah State Program and the Federal Lands Program.
- Sec. 13 **CULTURAL RESOURCES** - If during the course of mining operations, previously unidentified cultural resources are discovered, the permittee shall ensure that the site(s) is not disturbed and shall notify DOGM. DOGM, after coordination with OSMRE, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by DOGM within the time frame specified by DOGM.

ATTACHMENT A

CO-OP MINING COMPANY

BEAR CANYON MINE
FEE LEASE ADDITION



(Township 16 South, Range 7 East SLBM)

SCALE 1":24000'

**TECHNICAL ANALYSIS
(Includes Fee Lease Addition)**

**BEAR CANYON MINE
CO-OP MINING COMPANY
ACT/015/025**

**Emery County, Utah
August 11, 1989**

UMC 785.19 Alluvial Valley Floors-(RVS)

Existing Environment and Applicant's Proposal

Bear Creek Canyon encompasses limited unconsolidated streamlaid deposits (Plate 7-4). Although Bear Creek sustains sufficient water for limited agricultural activities, the applicant states that the "area has no history of agricultural attempts" (page 3-100). The Division determines that the lack of "agricultural attempts" also precludes past utilization of flood irrigation. Moreover, technical staff inspections of the mine site have not identified the presence of flood irrigation. Limited streamflow, poor soil conditions (Plate 8-1) and steep topography (Plate 7-4) indicate a low capability for the area to be flood irrigated.

Compliance

Sufficient information about alluvial deposits and irrigation are available to determine as required by UMC 785.19(c)(2) that no alluvial valley floors exist.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.11 Signs and Markers-(PGL)

Existing Environment and Applicant's Proposal

Signs and markers for the Bear Canyon Mine are described on page 3-30. The maintenance and removal schedule for all signs is outlined in Table 3.4-2, page 3-31.

Compliance

The size, description, maintenance and removal of signs for the Bear Canyon Mine meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.13-.15 Casing and Sealing of Underground Openings-(RVS)

Existing Environment and Applicant's Proposal

Boreholes. The applicant has drilled 14 boreholes for the purpose of evaluating the permit and adjacent area ground-water system (Appendix 7-A). Borehole locations have been identified on Plate 7-4. One additional borehole will be completed to further evaluate the ground-water system (page 7-43 and Plate 7-4).

The applicant states that, upon abandonment, all boreholes will be plugged with five feet of cement as required by Rule M-3(5), Utah Mined Land Reclamation Act of 1975 (page 3-66).

Entries. The applicant has committed to sealing all mine entries upon completion of mining (page 3-67). Seals will be constructed of solid concrete blocks in a double wall thickness (16 inches) and located a minimum of 25 feet from the entryway (page 3-67). Installation will include recessing the seals 16 inches and 12 inches into the rib and floor, respectively. Seals will not be recessed into the roof. Structural integrity will be enhanced by incorporating interlaced pilasters in the central portion of the seals.

Figure 3.6-1 (page 3-69) indicates entries will be backfilled to the seal (not less than 25 feet) with noncombustible material. The entryway and adjacent highwall (including the exposed seam) area will be backfilled with noncombustible material, graded, covered with suitable topsoil material and revegetated.

The applicant proposes to install temporary seals for entryways that are temporarily inactive (page 3-101). Temporary seals will be constructed of woven wire and posted. Boreholes utilized for ground-water monitoring will be sealed in a non-permanent fashion by installing PVC surface casing with a threaded cap for access.

Compliance

The applicant's proposals for permanently sealing boreholes and entries are designed to prevent access and preclude toxic drainage from entering ground or surface waters as required by UMC 817.13 and 817.15.

The applicant has provided adequate plans for posting signs and limiting access to temporarily inactive entries. The applicant's proposal for temporarily sealing boreholes (i.e., ground-water monitoring wells) meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.22 Topsoil: Removal-(HS)

Existing Environment and Applicant's Proposal

The Bear Canyon Mine was developed in an area of pre-Law (SMCRA) disturbance and had no topsoil removed from the majority of the ten acres of disturbance (page 8-18). The scale house and adjacent area (Plate 2-4) was disturbed by construction activities in approximately 1986. Topsoil and subsoil was analyzed (Appendix 8-A), and separately removed and stockpiled (Partial State Inspection Report, March 8, 9 and 10, 1983). Approximately 2,600 cubic yards of soil was stockpiled in the original topsoil storage pile (Plate 2-4) for final reclamation.

Topsoil material, approximately 3,400 cubic yards was purchased from R.D. Campbell (page 8-14) and stockpiled in the Ball Park Topsoil Storage Pile (Plate 8-4).

The calculated volume of topsoil required to redistribute six inches over ten acres equals approximately 8,067 cubic yards. Stored topsoil on site amounts to approximately 6,000 cubic yards of material. Consequently, a topsoil deficiency exists, equalling approximately 2,067 cubic yards (page 8-18).

The operator has proposed utilizing downcast material adjacent to the old portal access road as a plant growth medium for final reclamation (Appendix 8-D).

Chemical and physical analyses of all approved stockpiled soil material is located in Appendix 8-A. Soil mapping unit descriptions and a soils map are given in Appendix 8-B and on Plate 8-1, respectively.

Compliance

Coal mining activities occurred prior to the Surface Mine Control and Reclamation Act (SMCRA), Public Law 95-87 of August 3, 1977. Accordingly, no topsoil was salvaged from the majority of the disturbance. Topsoil was salvaged from the scalehouse area (approximately 3.2 acres). Analyses of the topsoil were conducted prior to removal (Appendix 8-A). Existing vegetation was removed and topsoil was separately removed, utilizing bulldozers, front-end loaders, and dump trucks (pages 8-19 and 8-20). Profile descriptions and chemical and physical data indicate no characteristics that would jeopardize reclamation success within the salvaged material.

Topsoil material purchased from R.D. Campbell has been sufficiently characterized by the applicant. Mass balance calculations indicate a topsoil deficiency for final reclamation (deficiency equals approximately 2,067 cubic yards). The applicant has proposed utilizing existing material on site (downcast material) or purchasing a suitable topsoil off site and hauling it to the mine (Appendix A, page 8A-2).

The Division will determine, based on physical and chemical characteristics of the substitute material, and results derived from the revegetation test plots whether downcast material will be suitable topsoil material.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.23 Topsoil: Storage-(HS)

Existing Environment and Applicant's Proposal

Topsoil was removed from the scale house area and placed in the original topsoil stockpile (Plate 8-4). Reseeding has already occurred and a berm has been constructed around the perimeter of the stockpile to contain any minor erosion on site (page 8-12). The as-built survey is shown on Plate 8-2.

Approximately 3,400 cubic yards of topsoil was purchased from R.D. Campbell (page 8-14) and stored within the Bear Canyon Ball Park Topsoil Storage Pile (Plate 2-4). The area was reseeded in the fall of 1988 and a protective berm has been constructed (page 8-15). A sprinkler system has been installed on the storage pile (NOV 89-32-2-1 abatement requirement).

Once a substitute topsoil material is adequately characterized for suitability and approved by the Division (see discussion under UMC 817.22), the operator ensures that the material is placed on a stable surface, protected from wind and water erosion, excluded from the influences of active operations, and left in place (page 3-61, 8-21 and 8-22).

Compliance

Removed and purchased topsoil has been placed within the permit area. Immediate redistribution of topsoil is not practical because essential facilities will remain operational throughout the life of the facility. The applicant has committed to promptly reclaiming disturbed areas when no longer needed for operations (page 3-61).

The areas where topsoil has been stored (Original Topsoil Pile and Ball Park Topsoil Storage Pile) are relatively flat. The surrounding terrain does not pose an imminent danger for slope failure.

The stockpiles have been adequately protected from wind and water erosion. There are no plans to move the stockpiles from their present location.

The operator has committed to fulfilling the requirements of this section for the proposed substitute topsoil material.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.24 Topsoil: Redistribution-(HS)

Existing Environment and Applicant's Proposal

Prior to the redistribution of topsoil, regraded land will be scarified by a ripper-equipped tractor to a depth of 14 inches (page 3-78).

Steep slope areas which must remain after abandonment will receive special ripping to create ledges, crevices, pockets and screes and are referred to as cat track terraces (page 3-80).

Topsoil redistribution procedures will ensure that approximately six inches of topsoil will be placed uniformly upon the approximate ten acres of disturbance (page 8-23). Topsoil will be redistributed in the fall of the year.

To minimize compaction of the redistributed topsoil, travel on reclaimed areas will be limited. After topsoil has been applied, surface compaction will be reduced with disking to a depth of six inches (page 8-23).

The applicant will exercise care to guard against erosion during and after application of topsoil and will employ wood fiber mulch and tackifier to ensure the stability of topsoil on graded slopes (page 8-23).

Compliance

The redistribution of topsoil to a uniform depth of six inches is adequate to support the postmining land use of recreation, livestock grazing, and wildlife habitat. The depth of redistributed topsoil closely parallels predisturbance conditions.

Scarification of regraded spoils and disking of redistributed topsoil will alleviate compaction caused by machinery traffic and ensure good overburden/soil contact, thereby preventing slippage and create a soil profile conducive to root penetration.

Regraded soils should be left in a roughened condition to provide micro-relief to reduce runoff and maintain available water supply to the vegetation.

All soil redistribution and seedbed preparation activities should be carried out when the soil is dry. Working on wet soil results in excessively compacted soil.

Wood fiber mulch and tackifying agents will ensure adequate protection from wind and water erosion by raising the wind profile above the soil surface and acting as a barrier against raindrop impact.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.25 Topsoil: Nutrients and Soil Amendments-(HS)

Existing Environment and Applicant's Proposal

Topsoil will be tested before it is seeded to determine the type and amount of fertilizer or neutralizer required (page 3-81). Soil analyses will be conducted for the following constituents: Soil Texture, Available Phosphorus and Nitrogen, pH, Electrical Conductivity and Sodium Adsorption Ratio. All necessary fertilization or neutralization, as determined by soil testing, will be done (page 3-81).

Compliance

The applicant has committed to sampling topsoil to determine deficiencies or toxicities which may inhibit or prevent revegetation success. At a minimum, the parameters listed above will be analyzed. Other parameters may be required, based on preliminary test results.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.41 Hydrologic Balance: General Requirements-(TM/RVS)

Existing Environment and Applicant's Proposal

Surface Water-(TM)

The applicant proposes to conduct all operations in such a way as to minimize potential impacts to surface and ground-water quality.

The following quotes describes the existing surface water environment at the Bear Canyon Mine.

"The channel of Bear Creek is straddled by the mine plan area with the vast majority of the area, disturbed and undisturbed, west of the creek. Bear Creek is a perennial stream with flows often frozen during the winter. An intermittent tributary flows into Bear Creek from the east in the mine plan area, but this tributary does not pass through any disturbed area" (page 7-50). Bear Creek flows into Huntington Creek approximately one mile south of the mine site.

The applicant has included Bear Creek flow data (1978-79) from a U.S. Geological Survey report in Table 7.2-2.

The applicant also included historical water quality and flow data from 1984-87. Data were obtained at three stations:

1. BC-1 Upper Bear Creek,
2. BC-2 Lower Bear Creek,
3. BC-3 Right Fork Bear Creek;

The applicant makes the following commitments regarding reclamation.

"Upon completion of mining activities, all diversion structures (ditches, culverts, ponds) shall be reclaimed as close to original configuration as possible. Sequencing of this reclamation shall be from the highest points in elevation to the lowest ones. In addition, the lower disturbed area collection ditches and sedimentation ponds shall not be removed until the reclaimed areas have been stabilized".

For additional technical information regarding reclamation see Section 7.3, Reclamation Hydrology.

Ground-Water-(RVS)

The applicant describes ground water as occurring under confined and unconfined conditions in the permit and adjacent area (page 7-5). Unconfined conditions occur within shallow alluvial deposits as local perched zones, whereas confined conditions are recognized at depth and are associated with fault zones and relatively

permeable lithologies that are overlain by impermeable rocks or juxtaposed by faulting against impermeable rocks (page 7-5). Surface percolation from snowmelt is thought to be the source of most ground-water recharge.

Three springs occur adjacent to the permit area. Bear Spring (140 gpm average flow) and Birch Spring (17 gpm average flow) are perennial and COP Development Spring is intermittent (Table 7.1-4).

The applicant states that spring flow is controlled by a fault zone that drains aquifers adjacent to the permit area (page 7-18). Discharge data indicate springs and seeps respond to seasonal runoff (Section 7.1.3, page 7-7). The applicant currently monitors Huntington Spring (SBC-4), Birch Spring (SBC-5), Co-Op Development Spring (SBC-6) and Mine Water Discharge (SBC-1), see Table 7.1-8.

The applicant initiated a drilling program (12 boreholes) to identify aquifers within the mine plan area. Data from four boreholes adjacent to the permit area were also utilized to characterize the regional ground-water system. One borehole (SBC-2), located adjacent to the main access portal, penetrated the Mancos Shale and did encounter traces of water (page 7-5). The remaining boreholes penetrated units above the Mancos Shale and did not encounter water (Table 7.1-5). These borehole data indicate aquifers within the vicinity of the permit area are laterally and vertically restricted to localized saturated zones (page 7-27).

Mine inflow totals approximately 60 gpm from the east bleeder area and minor roof drips that flow continuously (page 3C-10). Mine inflow is attributed to dewatering of localized aquifers and the intersection of mine workings with flow along fault/fracture conduits (pages 3C-16 and 3C-17).

Water quality data for springs and mine inflows are given in Table 7.1-3. These data indicate water quality is within state and federal standards.

Compliance

Surface Water-(TM)

The applicant has provided almost nine years of continuous water quality data on the Bear Creek drainage. The existing water quality in Bear Creek is marginal. The mine has sediment controls in place and routes all undisturbed drainage around the site, minimizing impacts to Bear Creek.

All data collected since the mine has been in operation shows that no changes to water quality and quantity to date have occurred due to mining. Therefore, a determination of minimal change to prevailing hydrologic balance can be made based on the assessment of data collected to date.

The applicant has committed to collect data in the future as outlined in the Division's Guidelines and shows the stations and parameters to be sampled in Tables 7.1-8 and 7.1-9 through 1995.

The applicant is in compliance with this section.

Ground-Water-(RVS)

The applicant has provided information about the occurrence, movement and quality of ground water that, in conjunction with the commitment to maintain a hydrologic barrier along the fault, allows a determination of minimal change to the subsurface hydrologic balance. Moreover, the applicant has committed to developing an additional in-mine borehole (page 7-43), acquiring additional baseline ground-water data (pages 7-37, 7-38 and Table 7.1-4), and submitting an Annual Hydrologic Monitoring Report (page 7-43).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.42 Water Quality Standards and Effluent Limitations-(TM)

Existing Environment and Applicant's Proposal

The applicant proposes the following water treatment measures for the mine plan area.

"The vast majority of the disturbed area of the Bear Canyon Mine is on the west side of Bear Canyon (same side as the mine portal and to the south). All the runoff from this west side disturbed area is collected and channeled to Sedimentation Pond A. The small amount of runoff from the disturbed area east of Bear Creek is channeled to Sedimentation Pond B. In order to minimize the amount of water crossing the disturbed area, runoff from the undisturbed area above the mine is diverted around or channeled through the disturbed area and into Bear Creek" (page 7-58).

The Co-Op Mining Company was issued by the Department of Health, Division of Environmental Health, general permit number UT-6040006 for five discharge points on May 4, 1989. This includes two sediment pond points and two underground discharge points. The permit and monitoring requirements for all discharge points is found on pages 7B-11 through 7B-31. A map showing all monitoring points is on page 7B-10.

All disturbed drainage which does not drain to a sediment pond and is small in size and treated by alternative sediment controls is described in Appendix 7-K and shown on Plate 7-1.

Compliance

All disturbed drainage and discharges are treated by treatment facilities or alternative sediment controls and meets all applicable state and federal effluent limitations and does not degrade receiving waters.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.43 Hydrologic Balance: Diversions and Conveyance of Overland Flow, Shallow Ground Water Flow and Ephemeral Streams - (TM)

Existing Environment and Applicant's Proposal

The applicant uses a series of diversion ditches and culverts to divert "disturbed" and "undisturbed" drainage through the Bear Canyon Mine Permit Area. The calculations for these structures are shown on two tables labeled "Summary of Ditch Sizes" and "Summary of Culvert Sizes" (Section 7.2.8).

Standard engineering practices were used in sizing the ditches and culverts. Refer to Plate 7-1 for locations of the various ditches and culverts and Plate 7-5 for watershed areas used to calculate design flows (Appendix 7-F).

Compliance

The Division has analyzed the design calculations proposed by the applicant for the disturbed and undisturbed surface water drainage plan. All temporary diversions, including ditches and culverts, have been designed to convey a 10-year, 24-hour peak flow (Appendix 7-F). Channel linings, silt fences and energy dissipators have also been designed according to UMC 817.43 and approved by the Division (Section 7.2.8, Figures 7.2-8 and 7.2-9).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.44 Stream Channel Diversions-(TM)

Existing Environment and Applicant's Proposal

The applicant has proposed to restore the natural drainage system found in the permit area. This includes two small ephemeral channels and Bear Creek, which is a perennial stream. The two ephemeral channels will be reconstructed in the locations, and to the dimensions shown in cross sections (C-C and D-D) and profiles (E and F) found on Plates 7-7 and 7-8. Table 7.3-1 contains a summary of the 100-year, 24-hour flows, expected velocities, Manning co-efficients, slope, and riprap sizing associated with the two ephemeral channels (Section 7.3.2).

Bear Creek channel restoration involves re-creation of the natural channel based on cross sections taken prior to channel disturbance. The applicant plans on using rock check dams along the course of the channel utilizing native materials to enhance reestablishment of riparian vegetation. The holding ponds created by the check dams will fill with sediment and minimize the downstream migration of silt and convert these silted-in areas into potential riparian vegetation areas (Section 7.3.3).

Measures will be taken to restore a pattern of riffles, pools and drops approximate to natural stream channel characteristics. Riprap and filter blankets under the riprap will be used to control erosion. These materials will be placed in the ephemeral channels as shown on Plate 7-7.

Compliance

The applicant has met the criteria spelled out in UMC 817.44(d)(1)(2)(3). Since no pre-existing cross sections for the two ephemeral drainages are available, the applicant has chosen to size these two channels based on the 100-year, 24-hour storm event criteria listed in UMC 817.44(b)(2). Bear Creek has been sized so that the capacity of the channel itself is equal to the capacity of the unmodified stream channel immediately upstream and downstream of the current diversion (see Plate 7-8). All three channels will be restored to a natural meandering shape at an environmentally acceptable gradient. Also, a pattern of riffles, pools and drops will be restored to approximate natural stream channel characteristics.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.45 Sediment Control Measures-(TM)

Existing Environment and Applicant's Proposal

Bear Canyon Road erosion control is proposed as follows by the applicant.

"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 inches of headwater depth will be maintained at the inlet of the 18 inch culverts. Culverts are fitted with trash racks to prevent plugging and buried and compacted a minimum of 30 inches to prevent crushing. In areas where velocities of runoff exceed five fps, erosion protection such as straw bales at 100 foot intervals or six-inch median diameter riprap on a bed of gravel/sand six inches thick shall be maintained. Culvert spacing conforms with the requirements of UMC 817.153(c)(2)(i). Rock or concrete headwalls shall be other erosion protection shall be the outlet" (Appendix 3-D).

Several alternative sediment control methodologies (i.e., silt fences and energy dissipators) are currently utilized or will be used as necessary within the permit area (Appendix 7-K, Small Area Exemptions).

Compliance

The applicant has provided the necessary PAP documentation regarding alternative sediment control areas (ASCA's), including identification (Appendix 7-K) and location of these ASCA's on Plate 7-1. Moreover, field inspections have determined that all these areas qualify as ASCA's and runoff from the ASCA's will meet applicable state and federal effluent limits. The total drainage area combined for the ASCA's is less than 15 percent of the total disturbed area, meeting Division guidelines.

Figures 7.2-8, 7.2-9, and 7.2-10 document acceptable installation designs for the ASCA's currently in place. Maintenance of all sediment control structures is discussed on page 3-8 of the PAP with a commitment to maintain structures to meet all applicable state and federal effluent limits.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds-(TM)

Existing Environment and Applicant's Proposal

The applicant includes the following proposal for sediment ponds in the PAP.

"The vast majority of the disturbed area of the Bear Canyon Mine is on the west side of Bear Canyon (same side as the mine portal and to the south). All runoff from this west side disturbed area is collected and channeled to Sedimentation Pond A. The small amount of runoff from the disturbed area east of Bear Creek is channeled to Sedimentation Pond B. In order to minimize the amount of water crossing the disturbed area, runoff from the undisturbed area above is diverted around or channeled through the disturbed area and into Bear Creek" (Section 7.2.6).

The disturbed area west of Bear Creek was split into three sections to facilitate calculations. The design calculations for both Pond A and B are found in Section 7.2.5.1.

The applicant chose to accept calculations derived by Division technical staff for sediment pond A and B. The calculations are as follows:

Design Criteria Pond "A"

Drainage Area: 14.35 Acres
SCS Curve #82
3-Year Sediment Storage: 41,444 ft³
10-Year, 24-Hour Runoff Storage: 42,714 ft³
Total Storage Volume: 84,158 ft³
Use Existing Spillway: 10 Foot Wide
Broad Crested Weir
Rainfall Data Base: Hiawatha Data by
E. Arlo Richardson

Design Criteria Pond "B"

Drainage Area: 1.82 Acres
SCS Curve #82
3-Year Sediment Storage: 2,156 ft³
10-Year, 24-Hour Runoff Storage: 8,182 ft³
Total Storage Volume: 10,338 ft³
Use Existing Spillway: 4 Foot Wide
Broad Crested Weir
Rainfall Data Base: Hiawatha Data by
E. Arlo Richardson

Plates 7-2 and 7-3 show a plan view and cross sections of Sedimentation Pond A and B, respectively.

Compliance

The applicant has provided adequate plans for the design of Pond A and Pond B. Design were implemented during the 1985 construction season.

The applicant has provided detailed plans for removal of the sedimentation ponds (pages 7-94, 7-95, and Plate 7-7a).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.47 Hydrologic Balance: Discharge Structures-(TM)

Existing Environment and Applicant's Proposal

The applicant addresses certain specific methods for reducing discharge related erosion from sedimentation ponds and diversions by installing energy dissipators, riprap channels and other devices, where necessary to reduce erosion and control flows (Figures 7.2-8 through 7.2-10 and Figure 7.2-1).

Compliance

The applicant has provided adequate plans for the design and implementation of erosion-reducing structures and/or practices. These include energy dissipators, silt fences, or riprap channel linings (Figures 7.2-8 through 7.2-10 and Figure 7.2-1).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.48 Hydrologic Balance: Acid-Forming and Toxic Forming Materials-(HS)

The applicant indicates on page 3-32 of the PAP that the mine produces no acid- and/or toxic-forming materials. Samples of the roof, floor and coal were analyzed and data are presented in Appendix 6-B.

Analyses of these materials indicate that they contain high Sodium Adsorption Ratio (SAR) values (floor materials) and an acid-forming potential (coal). Therefore, the applicant has committed to disposal of any acid- and/or toxic-forming material that is brought to the surface against the highwall and covering it with four feet of soil material (Appendix 3-E, page 3E-2).

Additionally, roof rock, coal fines and any material contaminated with coal fines and soil material contaminated with oil and grease will be placed against the highwall and covered with four feet of soil material (Appendix 3-E, page 3E-2).

Compliance

The applicant commits to covering all acid- and/or toxic-forming materials with four feet of suitable non-acid and non-toxic forming material.

Preliminary roof, coal and floor data indicate elevated SAR levels and an acid-forming potential. Co-Op disposes of underground development waste in abandoned areas underground, in accordance with UMC 817.71-.74 and MSHA regulations (page 3-8). Water quality data of in-mine water and existing ground water indicates minimal change to the subsurface hydrologic balance (see discussion under UMC 817.41).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments-(TM)

Existing Environment and Applicant's Proposal

The design, construction, and maintenance of the two temporary impoundments, Pond A and B is discussed in Section 7.2.7 of the PAP.

The applicant states that all embankments of temporary impoundments, the surrounding areas and diversion ditches, disturbed or created by construction shall be graded, fertilized, seeded and mulched to comply with the requirements of UMC 817.111-.117 immediately following embankment construction. Areas where vegetation is not successful, or where rills and gullies develop shall be repaired and revegetated (page 3-86).

Compliance

The applicant has not proposed any permanent impoundments to be left onsite, therefore, does not need to meet the requirements associated with permanent impoundments.

All the design requirements, slope stability, size, and maintenance for temporary impoundments has been adequately discussed in Section 7.2.7 of the PAP.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharges-(RVS)

Existing Environment and Applicant's Proposal

The applicant states that "strata in the Wasatch Plateau generally dip southerly (slightly southeast or southwest) at angles of one to three degrees" (page 6-4). Plate 3.4-1 indicates the dip within the mine plan and adjacent area ranges from one to two degrees in an overall southerly direction. Elevations shown on Plate 3-4 show the access portal, conveyor belt portal and fan portal to be lower than all other portions of the mine workings.

Mine inflow totals approximately 60 gpm from the east bleeder area and minor roof drips that flow continuously (page 3C-10).

Details of the permanent entry seals are given on Figure 3.6-1 and pages 3-67 and 3-69.

A monitoring (quarterly) and mitigation plan for unplanned portal discharges following mining is presented on page 7-57.

Compliance

The applicant has demonstrated that entries and accesses to underground workings are located, designed, constructed, and utilized to prevent gravity discharge from the mine. Moreover, the applicant has committed to monitoring and, if necessary, providing mitigation for unsuitable portal discharges following mining.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.52 Surface and Ground Water Monitoring-(TM/RVS)

Existing Environment and Applicant's Proposal

Surface Water-(TM)

The surface water operational monitoring plan is discussed on pages 7-53 through 7-57, and the water quality parameters to be tested are shown in Table 7.2-4, page 7-56.

The 1989-1995 Bear Canyon Mine Water Monitoring Matrix is found in Tables 7.1-8 and 7.1-9, page 41.

Surface Water Monitoring Stations are:

1. BC-1 Upper Bear Creek, located above the mining area, approximately 3,000 feet upstream from where the mine road crosses Bear Creek in the mine plan area.
2. BC-2 Lower Bear Creek, located downstream at Wier-4.
3. BC-3 Right Fork Bear Creek, located on the right hand tributary, just above the confluence with the main channel of Bear Creek.

The entire monitoring plan is found in Section 7.2.5.

The applicant has permitted four UPDES discharge points as shown on pages 7B-10 through 7B-31 under Permit Number UT-6040006. Two of these points are sedimentation pond outlets and two are underground seepage water overflows. No problems with water quality have been documented to date.

The applicant has committed to submitting quarterly data 90 days following sample collection, summarizing all data in an annual report, and sending all UPDES discharge report forms to the Division (page 7-57).

Ground-Water-(RVS)

The applicant commits to monitoring "mine roof seeps and sumps, dry drill holes within the mine, observation wells and springs" (page 7-37). Ground-water monitoring will include stations SBC-1 through SBC-8 (page 7-38) and will be conducted according to Table 7.1-6 and 7.1-7.

The applicant commits to providing an Annual Hydrologic Monitoring Report that includes a yearly update of the mine inflow survey (page 7-43).

Compliance

Surface Water-(TM)

On a quarterly basis as shown in Table 7.1-8 and 7.1-9, the parameter list shown in Table 7.2-5 will be utilized for sampling. This list was taken from the Division Water Quality Guidelines (Section 7.2.5) An annual report summarizing all data will be submitted to the Division.

The applicant is in compliance with this section.

Ground Water-(RVS)

The applicant has committed to acquiring baseline operational monitoring data for springs, mine inflows and boreholes and providing these data on a quarterly and annual basis.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.53 Hydrologic Balance: Transfer of Wells-(RVS)

Existing Environment and Applicant's Proposal

The applicant states on page 3-66 of the PAP that "upon abandonment of drilling operations, all drill holes are to be cemented with an approved slurry."

Compliance

The applicant has indicated that no boreholes will be transferred for further use as water wells.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.55 Discharge of Water into an Underground Mine-(TM)

Existing Environment and Applicant's Proposal

The applicant has obtained all the appropriate discharge permits from the Department of Health discussing discharge of any underground water.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.56 Hydrologic Balance: Postmining Rehabilitation of Sedimentation Ponds, Diversions, Impoundments and Treatment Facilities-(TM)

Existing Environment and Applicant's Proposal

The applicant provides the following information about restoration of the surface water drainage system.

"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" (page 3-71).

Compliance

According to the above statement, the applicant does not propose to retain any impoundments or drainage systems onsite.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones-(TM)

Existing Environment and Applicant's Proposal

The applicant has provided a map showing stream buffer zones and sign placement on Plate 2-4.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.59 Coal Recovery-(RVS)

Existing Environment and Applicant's Proposal

The Bear Canyon coal seam averages ten feet and the Hiawatha coal seam averages five feet in thickness (Table 3.4-1, page 3-27) over the proposed workings and are the extraction targets. Recoverable coal reserves were "conservatively" estimated to be 60 percent of the in-place coal reserves (page 3-28). Under Section 3.4.1.2 entitled "Mining Methods", the applicant states that room and pillar mining methods will be employed (page 3-15).

Compliance

The applicant proposes to conduct underground activities to maximize the utilization and conservation of the coal resource while utilizing current technology to maintain environmental integrity.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.61-.68 Use of Explosives-(RVS)

Existing Environment and Applicant's Proposal

The applicant states that there will be "no surface blasting activities incident to this underground operation" (page 3-10).

Compliance

Inasmuch as all blasting will be confined to underground, the applicant is in compliance with this section.

Stipulations

None.

UMC 817.71 Disposal of Excess Spoil and Underground Development Waste-(PGL)

Existing Environment and Applicant's Proposal

The applicant does not anticipate the handling of development waste rock in its mining operations. The applicant commits to submit plans for an approved waste disposal site, if needed. Currently, development waste is stored underground (page 3-57).

Compliance

Underground development waste is disposed underground.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.81-.88 Coal Processing Waste Banks-(PGL)

Existing Environment and Applicant's Proposal

The applicant does not process any coal onsite, therefore, this section is not applicable (page 3-7).

UMC 817.89 Disposal of Noncoal Waste-(PGL)

Existing Environment and Applicant's Proposal

Noncoal waste at the mine is placed in metal dumpsters. A local contractor empties these dumpsters when they are 80 percent full and sends the noncoal waste to an approved landfill (page 3-58).

Compliance

The applicant adequately disposes of noncoal waste at the Bear Canyon Mine.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.91-.93 Coal Processing Waste: Dams and Embankments-(PGL)

The applicant does not process any coal onsite, therefore, this section is not applicable.

UMC 817.95 Air Resources Protection-(PGL)

Existing Environment and Applicant's Proposal

The Bear Canyon Mine is not considered a "major source" under the PSD regulations because total annual controlled emissions of particulate matter are expected to be less than 250 tons/year (page 3-55). Chapter 11, page 3-130, includes a stipulated approval letter from the Division of Environmental Health (DEH) dated December 20, 1983. In June 1985, Co-Op Mining Company submitted a

revised plan to the Department of Health and Bureau of Air Quality, required by Condition Number Two. The revised plan was approved February 20, 1986. The fugitive dust control plan is included in Chapter 11.1.

Compliance

The applicant adequately addresses fugitive dust control for this mine site. The applicant also has the required approval from the Bureau of Air Quality.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.97 Fish and Wildlife Information-(BAS/WJM)

Existing Environment and Applicant's Proposal

Fish and wildlife resource information is discussed in Chapter Ten. A variety of wildlife species use the variable habitats within and adjacent to the permit area (Appendix 10-B).

Economically important mammals, which are most likely impacted by mining operations, include mule deer and elk. Other high interest mammals present include the cougar, black bear, bobcat and snowshoe hare. The major impact to these species is loss of habitat (Section 10.4.2). Seasonal distribution is shown on Plate 10-1.

Two endangered species of birds may occur on or near the permit area. These are the bald eagle and peregrine falcon. Neither species has been observed, nor are there known roosting trees or nesting sites within the permit area (Section 10.3.3.2). No other threatened or endangered species is known to occur in the mine plan area (Sections 10.3.3.1 and 9.4).

Bear Creek, a perennial stream (see discussion under UMC 817.41), drains into Huntington Creek, classified as a Class Three fishery by DWR. Huntington Creek supports natural reproduction of self-sustaining cutthroat and brown trout populations (Appendix 10-B).

Powerpole configurations have been determined by the U.S. Fish and Wildlife Service (USFWS) to not require corrective modification as long as raptor mortality continues not to occur (letter from USFWS to DOGM, dated July 6, 1983).

A minimum of either 100 or 200 foot barrier pillars to the outcrop (see discussion under UMC 817.121-.126) will be maintained to minimize potential adverse impacts to nesting raptors from subsidence and possible escarpment failure (page 3-18).

Hazardous or toxic materials used at the mine will be disposed of in a manner approved by regulatory authorities (page 3-32, Appendix 3-E). Hazards to wildlife will be covered, buffered, or fenced (Section 10.5).

Barriers to migration or other movement will be remedied as directed by DWR (page 3-54).

No pest control measures will be implemented without approval from the Division (Section 10.5).

Water sources necessary to wildlife will be provided (Section 3.5.6.2). In addition, riparian habitat on Bear Creek has been enhanced by installation of velocity dissipators, and planting of species valuable for wildlife (Appendix 10-D).

During the first suitable planting season following mining, the applicant will implement permanent revegetation, designed to restore and enhance wildlife habitat on disturbed areas (Section 3.6.5). The revegetation mix includes herbaceous and woody species, adapted to on-site conditions and of known value to wildlife for cover, forage or both (Section 9.5.5).

Compliance

The applicant has adequately characterized adverse impacts to fish, wildlife, and related environmental values in Section 10.4 and Appendix 10-B.

A commitment to report any threatened and endangered species or their critical habitat observed on the permit area during operations has been made (Section 10.3.3.1). A commitment to report any golden eagles observed has also been made (page 3-54). The applicant commits to raptor-safe design and construction of electric powerlines and other transmission facilities (Section 10.7).

Impact avoidance, mitigation and wildlife monitoring discussed in Sections 3.5.6.2, 10.5 and 10.7, and Appendices 10-B and 10-D comply with the requirements of paragraph (d) of this section.

Adequate plans for permanent vegetation of the site have been provided (Section 9.5; see discussion under UMC 817.111-.117). Species to be used for revegetation will provide nutritional value and cover for wildlife and will enhance fish and wildlife habitat after bond release. Plants will be grouped in a manner which optimizes edge effect (page 9-23).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to take all necessary steps to remedy any adverse impacts from slides and notify the Division by the fastest available means to safeguard human and environmental values as stated on page 3-41.

Compliance

The applicant's commitment to notify the Division and remedy any adverse impacts from slides meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation-(BAS/WJM)

Existing Environment and Applicant's Proposal

The interim reclamation plan is described in Appendix 3-G. Reclamation will proceed as contemporaneously as practicable, and during the first normal period for favorable planting conditions (Section 3.6.5).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading-(PGL)

Existing Environment and Applicant's Proposal

Backfilling operations will be conducted in the portal and treatment facility areas. Compaction operations will include the use of equipment such as sheepsfoot tampers to stabilize all filled holes and depressions. The portal fill material will be put in place with a LHD (page 3-72).

A backhoe and dozer will work conjunctively to remove the outer edge of the operational benches and compact it against the highwall. The backhoe will reach over the edge of the bank (approximately 20 feet) pulling back material. The dozer will then push and compact material from the highwall outward to reach a bench slope of approximately 3h:1v.

The procedure will continue from the upper benches down the canyon reshaping the mine yard and disturbed area to the configuration shown on Plate 3-2, Postmining Topography.

As backfilling and grading is completed, operational areas will be scarified by ripping to a depth of 14 inches with a dozer.

Topsoil will be spread over the disturbed areas after the grading and ripping is complete.

A stability analysis of this area demonstrates a factor of safety greater than 1.3 (page 3-75) (Stability Analysis - Appendix 3F).

The applicant proposes to reduce or retain highwalls in some areas as follows: "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 applicant proposes to retain highwalls in some areas. The rationale for leaving or reducing highwalls offered by the applicant is stated on page 3-78. Plate 3-2 delineates highwalls that will be retained.

Compliance

The applicant's proposal to backfill and grade the Bear Canyon Mine site meets the requirements of this section. The rationale for retention of highwalls is acceptable.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.106 Regrading or Stabilizing Rills and Gullies-(HS)

Existing Environment and Applicant's Proposal

If rills and gullies form, the applicant has committed to a four phase approach to the stabilization of the area: (1) diversion of

water away from the area; (2) distribution of additional soil material in order to fill the rills and gullies; (3) recontouring of the area; and (4) reseeding (page 3-86).

Compliance

The applicant has provided a specific plan to regrade or stabilize rills and gullies.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.111 Revegetation: General Requirements-(BAS/WJM)

Existing Environment and Applicant's Proposal

The applicant's reclamation plan is contained in Sections 3.6 and 9.5. A commitment has been made to recreate a permanent and diverse vegetative cover (Sections 3.5.5.2 and 3.6.5). Following topsoil redistribution and seedbed preparation (see discussion under UMC 817.22 and 817.24), the disturbance area will be drilled or hydroseeded (Sections 9.5.2 and 9.5.4.1).

Two seed mixes (Section 9.5.5) are proposed for restoration of riparian and pinyon/juniper-grass vegetation types. The riparian mix (Table 9.5-2) consists of five grass, six forb and four shrub species. Supplemental stocking of woody plants will follow seeding (Section 9.5.4 and page 9-2). The pinyon/juniper-grass mix consists of five each of grass, forb, and shrub species. Supplemental stocking of three tree species will follow seeding by two years (page 9-23).

Rates of broadcast seeding exceed 80 PLS/ft² for both mixes. Rates will be reduced by half for drill-seeding.

With the exception of yellow sweetclover, all plant materials proposed for either mix are native perennials, adapted to local conditions.

Compliance

Reclamation plans are adequate to ensure a diverse, effective, and permanent vegetative cover.

Plant materials are capable of regeneration and plant succession. A timely recovery of vegetative cover and productivity will be facilitated by the applicant's monitoring commitments (Section 3.6.6.2).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.112 Revegetation: Use of Introduced Species-(BAS/WJM)

Existing Environment and Applicant's Proposal

Yellow sweetclover (*Melilotus officinalis*) is proposed for use in the riparian seed mix (page 9-21). The pinyon/juniper-grass mix consists entirely of native species.

Compliance

Yellow sweetclover, an introduced species, is not persistent. Its fast-growing, nitrogen-fixing characteristics are valuable for soil stabilization and enrichment.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.113 Revegetation: Timing-(BAS)

Existing Environment and Applicant's Proposal

The applicant commits to reclaim immediately after final site preparation (Appendix 3-G). Further details are provided in Sections 3.6.1 and 3.6.2.

Following cessation of operations and final site preparation, seeding of disturbed areas will be conducted (Section 9.5). Seeding will occur in the fall (page 9-12), which is the normal period for favorable planting conditions. Supplemental planting of seedlings is scheduled to follow seeding by two years (page 9-23).

The applicant commits to as rapid a restoration as possible, using the best technology available (page 3-58 and 3-59).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.114 Revegetation: Mulching-(BAS/WJM)

Existing Environment and Applicant's Proposal

Soil stabilization and moisture retention will be facilitated by soil redistribution procedures (Section 8.8). The soil surface will be left in a rough condition (page 3-64). Terraces will be created along slope contours (Plate 3-2).

Wood fiber hydromulch will be applied to all seeded areas (Section 9.5.2). The rate of application (from 1200 to 2500 lbs/acre) will be determined by slope steepness (page 9-14). Mulch will be anchored with a chemical tackifier (page 9-13).

Compliance

Soil stabilization practices, use of mulch, and chemical stabilizers satisfy the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.116 Revegetation: Standards for Success-(BAS/WJM)

Existing Environment and Applicant's Proposal

The applicant commits to restore disturbed areas to a condition equivalent to premining conditions (pages 3-87 and 3-88). If monitoring indicates rill or gully formation or other vegetation inadequacies, damage will be repaired and the area reseeded (page 3-86).

A composite reference area was established in 1983 to represent premining pinyon/juniper and riparian vegetation types (Plate 9-1 and Appendix 9-A). Reference area sampling data (Appendix 9-A) serves as the initial success standard for disturbed areas, although concurrent sampling of all reclaimed areas and reference areas in years 9 and 10 of the bond liability period will ultimately determine revegetation success.

Reclamation will be considered successful when cover, productivity, and woody plant density are 90 percent of their reference area counterparts at 90 percent statistical confidence (page 3-87).

Revegetation monitoring plans are presented in Sections 3.6.5.6 and 3.6.6.2. Under interim reclamation (Section 3.6.5.6), all seeded areas will be inspected annually. Steps will be taken to correct problem areas (page 3-84). For permanent reclamation (Section 3.6.6.2), the applicant commits to annual qualitative monitoring and quantitative sampling during years 2, 3, 5, 9 and 10 of the bond liability period. Sampling will consist of cover, composition, and woody plant density measurements. Productivity will be evaluated during years 9 and 10 (page 3-87).

Compliance

Success of reclamation will be measured by sampling methods approved by the Division. Vegetative parameters of the approved reference area will be compared with reclaimed areas to document revegetation success.

Monitoring during the 10-year liability period is sufficient to document progress toward reclamation objectives. All monitoring will meet sample adequacy requirements for a statistically adequate sample size (Section 3.6.6.2). The applicant has committed to remedy reclamation inadequacies by reseeding (page 3-86) or by supplemental stocking with woody plants (Sections 9.5.4 and 9.5.5).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.117 Revegetation: Tree and Shrub Stocking on Forest Land-(BAS/WJM)

Existing Environment and Applicant's Proposal

All disturbed surface area is under private ownership (Section 4.3.1.1), but because wildlife habitat is an approved postmining land use, this section applies. The applicant proposes to include raw shrub seed at a rate of 13.8 lbs/acre in the pinyon/juniper grass seed mix, and 12.5 lbs/acre in the riparian seed mix (page 9-21 and 9-22).

Within two years of seeding, native tree and shrub seedlings will be planted as necessary to achieve woody plant density standards (Sections 9.5.4 and 9.5.5).

Compliance

The rate of shrub seed application, augmented by tree and shrub planting is expected to equal or exceed 90 percent of the pre-disturbance stocking level (Appendix 9-A) with 90 percent statistical confidence.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.121-.126 Subsidence Control-(RVS)

Existing Environment and Applicant's Proposal

The Bear Canyon coal seam is the primary mining target for this permit term (Table 3.4-1, page 3-27). The applicant states (page 15) that room and pillar methods will be used to extract the Bear Canyon coal seam. Overburden, within and adjacent to the permit area, ranges from approximately 100 to 1,800 feet and encompasses the lower portion of the North Horn Formation, Price River Formation, Castlegate Sandstone and upper portion of the Blackhawk Formation (page 6-18 and Plate 3.4-1). Maximum subsidence is projected to be 5.4 feet directly above a pillared panel (Appendix 3-H, page 3H-7).

A survey of renewable resource lands was conducted on June 13, 1984 and the applicant concludes that subsidence will not impact the hydrologic balance, timber, vegetation for grazing, fish and wildlife, paleontological and archeological resources, man-made structures and mineral and hydrocarbon resources (Appendix 3-H). The applicant indicates no surface facilities or structures exist over mine areas (page 3-19) and, therefore, no man-made structures will be impacted by subsidence induced material damage.

The applicant commits, on page 3-18 and page 3H-6, to maintaining a minimum 100 foot outcrop barrier pillar. Plate 3-4 indicates a minimum 200 foot wide outcrop barrier will be established.

Appendix 3-H includes a plan for installing four permanent subsidence monitoring stations. The stations are located in Sections 14 and 23 (Figure 3-3) and will be monitored at "nominal" six month intervals. The applicant commits to conducting a yearly field investigation for the purpose of identifying and recording surface manifestations of subsidence until the completion of reclamation (Appendix 3-H, page 5A-6). Annual results of the field investigation and subsidence monitoring program will be submitted to the Division as part of the annual report (page 3H-10).

The applicant commits to notifying all owners of property within the area that may be impacted by subsidence per UMC 817.122 and mitigating for materially damaged structures and surface lands as described by UMC 817.124 (pages 3H-10 through 3H-12).

The applicant identifies Bear Canyon Spring, Birch Spring and COP Development Spring as occurring adjacent to the permit area (page 7-6). COP Development Spring is characterized as intermittent, whereas Bear Canyon Spring and Birch Spring are identified as perennial with average flows of 140 gpm and 17gpm, respectively (Table 7.1-4). Bear Canyon Spring and Birch Spring are public water sources.

Fault zones are given as the mechanism controlling recharge to Bear Canyon Spring, Birch Spring and COP Development Spring (page 3C-9). Data from boreholes drilled within and adjacent to the permit area indicate aquifers are laterally and vertically restricted to localized saturated zones (page 7-4). Borehole SBC-2 did not encounter water, indicating the Star Point-Blackhawk aquifer does not occur everywhere above the Mancos Shale (page 7-5). The applicant anticipates a certain amount of localized diversion and interception of the present ground-water flow due to subsidence (page 7-34). However, the applicant also expects these impacts to be minimal because most subsidence cracks will naturally seal (page 7-34).

The applicant has committed to maintaining a barrier along the fault inby the main access portal to prevent impacts to spring flow (Plate 3-4A).

Compliance

The applicant has provided information about mining methods, overburden thickness and vertical movement that indicate activities have been planned and will be conducted to prevent subsidence from causing material damage (UMC 817.121). Moreover, the applicant has adequately committed to public notification (UMC 817.122) and surface owner protection (UMC 817.124).

The applicant indicates flow to Bear Canyon Spring and Birch Spring, both public water sources, is controlled by faults or fault zones. The applicant has committed to maintaining a barrier along the fault inby the access portal to prevent impacts to spring flow (UMC 817.126).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.131 Cessation of Operations: Temporary-(PGL)

Existing Environment and Applicant's Proposal

In the event of a temporary cessation of operations, the applicant commits to notify the Division within 48 hours of pending shutdown and submit all necessary information, i.e., exact number of surface acres and the horizontal and vertical extent of subsurface strata in the permit area prior to cessation or abandonment, extent and kind of surface reclamation, and identification of backfilling, regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during temporary cessation (pages 3-100 and 3-101).

Compliance

The applicant's commitment meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.133 Postmining Land Use-(BAS/WJM)

Existing Environment and Applicant's Proposal

Mining commenced in Bear Canyon in 1896 and continued until 1906. The mine reopened in 1938 and was worked intermittently until 1957. The site was then abandoned until Co-Op Mining Company resumed mining in 1981 (Section 4.4.2).

Premining uses of the permit area included livestock grazing, wildlife habitat and recreation (Section 4.4). Present management emphasizes wildlife habitat, livestock grazing, and watershed management (Section 4.4.2). The U.S. Forest Service, State of Utah, and Emery County administer the permit and adjacent areas (Section 4.3.1.2).

The applicant proposes to return Bear Canyon Mine to premining land uses, which include wildlife habitat, livestock grazing and recreation. All buildings and support facilities will be removed from the permit area after cessation of operations (page 3A-7 and 3-90).

Compliance

The reclamation plan is adequate to ensure a timely return to conditions capable of supporting premining uses. Wildlife habitat, livestock grazing, and recreation may be considered the highest and best uses achievable. These uses are compatible with those in the surrounding area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.150-.156 Roads: Class I-(PGL)

Existing Environment and Applicant's Proposal

The Bear Canyon Road is approximately 1,800 feet long from the gate to the scale house (page 3-9). The road is constructed 30 feet wide and surfaced with six inches of 3/4-inch gravel. Drainage is provided along the road by ditches at least 1.8 feet deep. Culverts are installed (shown on Plate 3-5) and will be protected by rock lining or concrete headwalls. Culverts are installed with a trash rack and rock headwall at inlets and riprap at outlets to prevent erosion. The road is maintained and will be maintained throughout the life of the operation. This road will be reclaimed at the end of the operation and all culverts will be removed (Appendix 3-D).

Compliance

The Class I Haul Road meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.160-.166 Roads: Class II-(PGL)

Existing Environment and Applicant's Proposal

The mine area and portal access road is approximately 2,112 feet long. The road is used primarily for access to the mine portals and other facilities. The overall grade does not exceed 10 percent.

The horizontal alignment is consistent with existing topography. The road is surfaced with four inches of three-quarter-inch gravel, and is maintained. The road will be removed upon completion of the mining operation (page 3-9, Appendix 3-D).

There are three other Class Two roads within the permit area: road to Sedimentation Pond A (430 feet long); road to coal preparation facility (600 feet long); and, bathhouse road (160 feet long). All of these roads are surfaced with four inches of three-quarter-inch gravel and will be maintained in such a manner that approved design standards are met. All of these roads will be removed upon completion of the mining operation (page 3-9 and Plate 3-1A).

Ditches are maintained. Rock or concrete headwalls are provided at inlets to all culverts, and riprap or other erosion protection is installed (Plates 3-1 and 3-5).

Compliance

The Class Two roads at the Bear Canyon mine site meet the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.170-.176 Roads: Class III-(PGL)

Existing Environment and Applicant's Proposal

A small pre-Law jeep trail is shown on Plate 2-4. This road is blocked off and not used. This section is not applicable.

UMC 817.180 Other Transportation Facilities-(PGL)

Existing Environment and Applicant's Proposal

The coal storage yard is equipped with a system of conveyors whereby coal can be segregated according to size. The truck loadout is a conveyor system designed to load tractor-trailer trucks. Coal exits the mine via the conveyor. All conveyors and other facilities will be maintained in such a manner as to prevent damage to fish, wildlife and related environmental values (Appendix 3-A, pages 3-A4 and 3-A6).

The applicant commits to remove facilities and restore those areas to prevent damage to fish, wildlife, and associated environmental issues (page 3-68).

Compliance

The applicant's commitment to maintain these facilities and remove them in order to prevent damage to fish, wildlife, and associated environmental values meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.181 Support Facilities and Utility Installations-(PGL)

Existing Environment and Applicant's Proposal

Support facilities associated with the mine are described in Appendix 3-A:

- temporary scalehouse;
- coal storage facilities;
- crush facility;
- fuel storage tanks;
- shop;
- power transformer;
- principal conveyor structure;
- noncoal storage yard;
- new scalehouse;
- mine office;
- magazines; and
- electrical storage shed.

The applicant states that facilities will be maintained and the area restored in such a manner to prevent damage to fish, wildlife, and related environmental issues (page 3-68).

Compliance

The applicant's proposal for support facilities and utility installations meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 828.00 Prime Farmland Investigation-(HS)

Existing Environment and Applicant's Proposal

A November 25, 1983 letter from the state soil scientist indicates there are no lands identified as prime farmland within or adjacent to the proposed permit area (page 8C-2).

Compliance

There are no soil map units within the permit area that have been designated prime farmland by the Soil Conservation Service. The area is too steep to be considered for prime farmland. More than 10 percent of the surface layer consists of rock fragments coarser than three inches.

The applicant is in compliance with this section.

Stipulations

None.

djh
AT71/1-36

**GENTRY MOUNTAIN
CUMULATIVE HYDROLOGIC IMPACT
ASSESSMENT**

Bear Canyon Mine, ACT/015/025

Deer Creek Mine Waste Rock Storage Facility, ACT/015/018

Hiawatha Mines Complex, ACT/007/011

Star Point Mines, ACT/007/006

Trail Canyon Mine, ACT/015/025

Carbon County and Emery County, Utah

Revised August 1989

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I. INTRODUCTION

The purpose of this report is to provide a Cumulative Hydrologic Impact Assessment (CHIA) for Gentry Mountain, located in Carbon and Emery counties, Utah. This assessment encompasses the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and whether the operations proposed under the application have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area. This report complies with legislation passed under Utah Code Annotated 40-10-1 et seq. and the attendant State Program rules under UMC 786.19(c).

Gentry Mountain occurs within the Wasatch Plateau Coal Field, approximately 10 miles southwest of Price, Utah (Figure 1). The eastern margin of the Wasatch Plateau forms a rugged escarpment that overlooks Castle Valley and the San Rafael Swell to the east. Elevations along the eastern escarpment of the Wasatch Plateau range from approximately 6,500 to over 9,000 feet.

Precipitation varies from 40 inches at higher elevations to less than 10 inches at lower elevations. The area encompassed by the Wasatch Plateau may be classified as semiarid to subhumid.

GEOLOGY

Outcropping rocks of the Wasatch Plateau Coal Field range from Upper Cretaceous to Quarternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) through littoral (Star Point Sandstone) and lagoonal (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation and North Horn Formation) and lacustrine (Flagstaff Limestone) depositional environments. Oscillating depositional environments within the overall regressive trend are represented by lithologies within the Blackhawk Formation. The major coal-bearing unit within the Wasatch Plateau Coal Field is the Blackhawk Formation.

VEGETATION

Vegetation of the Wasatch Plateau area is classified within the Colorado Plateau Floristic Division (Cronquist et al., 1972). The area occupies parts of both the Utah Plateaus and the Canyon Lands Floristic sections. Vegetation communities of the area include Desert Shrub (Shadscale) at the lowest elevations through Sagebrush, Sagebrush-Grassland, Pinyon-Juniper, Mountain Brush, Douglas Fir-White Fir-Blue Spruce and Engleman Spruce-Subalpine Fir.

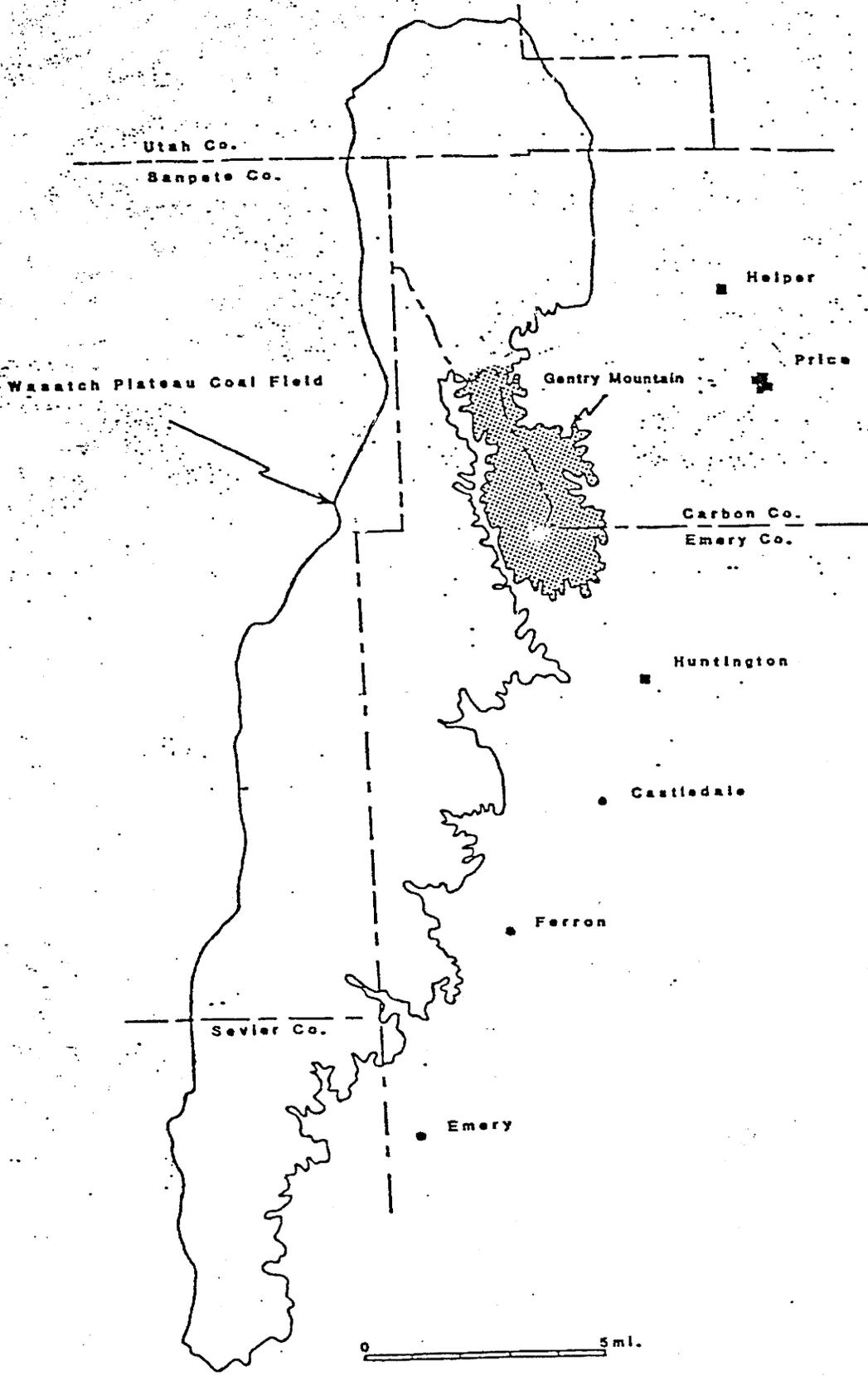


Figure 1. Wasatch Plateau Coal Field.

Desert Shrub communities are sparsely vegetated shrublands that, depending on elevation and soils, may be dominated by Shadscale (Atriplex confertifolia), Fourwing saltbush (A. canescens), Castle Valley clover (A. nuttallii) or Mat saltbush (A. corrugata) and can include Winter fat (Ceratoides lanata), Mormon tea (Ephedra spp.), Budsage (Artemisia spinescens), miscellaneous buckwheats (Erigonum spp.), Indian ricegrass (Oryzopsis hymenoides), Galleta grass (Hilaria jamesii), Grama grass (Bouteloua spp.), Needle and thread grass (Stipa comata), Sand dropseed (Sporobolus airoides) and Squirrel tail (Sitania hystrix). Greasewood (Sarcobatus vermiculatus) - Saltgrass (Distichlis stricta) can dominate bottomlands.

Many sagebrush communities of the area are relatively dense shrub stands of (Artemisia tridentata var tridentata) with very little understory growth. In relatively undisturbed Sagebrush communities, Rabbitbrush (Chrysothamnus nauseosus or C. viscidiflorus), Mormon tea, and several perennial grasses including Thickspike and Western wheatgrass (Agropyron dasystachyum and A. smithii), Great Basin wildrye (Elymus cinereus), Indian ricegrass and Dropseed species may be common.

In the Sagebrush-Grassland type, the typical Big sage may give way to Artemisia tridentata var vaseyana (Mountain big sage) with a co-dominant perennial grass understory. Salina wildrye (Elymus salinus) can be co-dominant in these communities and may dominate an herbaceous Grassland type. Black sage (A. nova) with Salina Wildrye or Western wheatgrass understory is also common.

Pinyon-Juniper woodlands occupy drier sites often with stoney to very rocky soils. Pinus edulis and Juniperus osteoperma are co-dominant in the overstory. Understory vegetation ranges from sparse to moderate ground cover on range sites in poor to excellent condition. Understory species include Sagebrush, Mountain mahogany (Cercocarpus montanus), Snowberry (Symphoricarpus oreophilus), and several perennial grasses including Slender wheatgrass (Agropyron trachycaulum), Salina wildrye, June grass (Koeleria cristata) and Indian ricegrass.

Dominant shrubs of the Mountain Brush communities will vary depending on elevation and aspect. The drier south and west facing slopes may support dense stands of Gambel's oak (Quercus gambellii). Other dominants of this community may include Serviceberry (Amelanchier utahensis), Mountain mahogany (Cercocarpus montanus or C. Ledifolius), Bitterbrush (Purshia tridentata) and Snowberry.

The range of the Douglas Fir-White Fir-Blue Spruce community is about 8,000 to 10,000 feet. Douglas Fir (Pseudotsuga mensiesii) is usually the dominant tree with White Fir (Abies concolor) and Blue Spruce (Picea pungens) usually limited to the most mesic sites, often along streams. With dense canopies, understory vegetation may be sparse. Common shrubs include Serviceberry (Amelanchier spp.), Oregon grape (Berberis repens), Chokecherry (Prunus virginiana), Rocky Mountain Maple (Acre glabrum), Mountain lover (Pachistima myrsinites) and Snowberry. Bluebunch wheatgrass (Agropyron spicatum), Mountain brome (Bromus marginatus), and Kentucky bluegrass (Poa pratensis) are common grasses. Aspen stands (Populus tremuloides) can be found throughout the zone, particularly in mesic sites and as successful communities.

Picea engelmannii and Abies lasiocarpa dominate the Spruce-Fir zone at the highest elevations of the hydrologic impact area. While receiving about the same precipitation as the Douglas Fir communities, lower evapo-transpiration with cooler temperatures can permit a more lush vegetation in the Spruce-Fir zone. Limber pine (Pinus flexilis) often occupies steep or rocky, drier sites of this zone.

Small riparian communities are found at all elevations within the impact assessment area. With greater water availability and cooler temperatures, the riparian zone often includes more mesic species, e.g., those from a higher vegetation zone. Shrub species from the Mountain shrub type may be found at most elevations.

Additional riparian zone shrubs include Narrowleaf cottonwood (Populus angustifolia), Redosier dogwood (Cornus stolonifera), Skunk bush (Rhus trilobata), river birch (Betula occidentalis) and various willows (Salix spp.). Grass species from the mesic zones may be represented (Mountain shrub and higher zones) along with fescues (Festuca spp.) and miscellaneous sedges (Carex spp.). Small wet areas around springs and seeps will often support a dense growth of grasses, sedges and willows.

HYDROLOGY

Surface runoff from the Wasatch Plateau area flows either to the Price River Basin or the San Rafael River Basin. The Price River Basin, which includes about 1,800 square miles in six counties, is located primarily in Carbon and Emery counties in East-Central Utah. The San Rafael River Basin, which includes about 2,300 square miles in three counties, is located mainly in Emery County to the south of the Price River Basin. The Price River drainage originates in the Wasatch Plateau about 12 miles west and south of Scofield Reservoir. Downstream from the reservoir the river flows in a generally southeasterly direction. The drainage is bounded by the Book Cliffs on the northeast, the Wasatch Plateau on the west, and the San Rafael Swell on the south. The San Rafael River Basin occupies part of two physiographic sections of the Colorado Plateau - the High Plateaus to the north and west and Canyonlands to the south and east (Fenneman, 1946). Principal streams in the basin are

Huntington and Cottonwood creeks, which merge to form the San Rafael River, and Ferron Creek, which joins the San Rafael River within a mile of that confluence. The San Rafael River also flows in a southeasterly direction to eventually join the Green River, after travelling from its headwaters in the Wasatch Plateau.

The water quality of both the Price River and the San Rafael Rivers is good in the mountainous headwater tributaries, but deteriorates rapidly as flow traverses the Mancos Shale. The shale lithology typically has low permeability, is easily eroded and contains large quantities of soluble salts that are major contributors to poor water quality. Depending upon the duration of contact, water quality degrades downstream to where Total Dissolved Solids (TDS) levels of 4,000 milligrams per liter (mg/l) are not uncommon. The predominant ion leached from the Mancos Shale is sulfate (SO_4) with values over 1,000 mg/l common in the lower reaches of the Price River.

Ground water is present in all lithostratigraphic units within the Wasatch Plateau Coal Field. Ground water occurs under localized conditions that often form a system of "perched" aquifers and associated springs and/or seeps. Significant localized ground-water resources are associated with the North Horn Formation and Price River Formation. The U.S. Geological Survey has identified and formally designated the Star Point-Blackhawk aquifer as the only regional ground-water resource occurring in the Wasatch Plateau Coal Field (Danielson, et al., 1981 and Lines, 1984).

II. CUMULATIVE IMPACT AREA (CIA)

Figure 2 delineates the CIA for current and projected mining in the Gentry Mountain area. The CIA encompasses approximately 112 square miles and includes Gentry Mountain, Wild Cattle Ridge and Star Point. The western and northern CIA boundaries are designated by drainages and drainage divides, whereas the southern and eastern boundaries are defined by T16S/T17S and R8E/R9E SLBM, respectively.

III. SCOPE OF MINING

STAR POINT MINES (PLATEAU MINING COMPANY)

The Plateau Mining Company permit area encompasses approximately 7,000 acres. There are three federal coal leases that are designated by the Bureau of Land Management as "Logical Mining Units" (LMUs): U-13097, SL-031286, and U-037045.

Mining operations began in 1916 when the Wattis Brothers and Mr. Browning bought 160 acres from the United States and developed the property for coal production. Coal was shipped in the autumn of 1917 when the railroad was completed, to the town of Wattis. The Lion Coal Company bought the coal interests in 1919. In 1967 Plateau Limited opened a new mine in the Hiawatha Seam. In 1971 United Nuclear purchased the mine and in July 1980 Plateau Mining Company bought the properties.

Historically, the Star Point #2 Mine (where mining has ceased) developed coal resources in the Hiawatha, Third, and Wattis seams by the room and pillar technique. During the permit term of 1987-1992, mining will occur in the Wattis and Third seams and development work is projected for the Hiawatha seam in the Star Point #1 Mine. Subsequent permit terms will involve further mining in all three of the coal seams through the year 2010. There will be room and pillar mining and longwall mining in the Wattis and Third seams and longwall mining in the Hiawatha seam.

There are certain areas where the cumulative effects of multiple seam mining will be experienced. The area of T15S R7E, Section 12, will have combined subsidence effects, and potentially, Section 18 of T15S R8E.

HIAWATHA MINES COMPLEX (U.S. FUELS COMPANY)

The Hiawatha Mines Complex permit area encompasses about 12,000 acres and is located adjacent to the Plateau Mining Company permit area. The Federal coal leases currently designated as LMUs are SL-025431 and U-026583. A large portion of the remainder of the coal is owned by U.S. Fuels. Coal is projected to be mined until the year 2014.

The Hiawatha Mines Complex is a consolidation of the original King, Hiawatha, Black Hawk, and Mohrland coal mines which began operating in the early 1900's. U.S. Fuels Company was organized in 1915 and began operating in 1916, when it took over the properties of the Consolidation Fuel Company, Castle Valley Coal Company, and Black Hawk Coal Company, all of which were located within the current permit boundary.

Mining has occurred throughout large portions of the permit area by the room and pillar technique: King 4 (A and B Seams), King 5 (B Seam), King 6 (A and Hiawatha Seams), King 7 (Hiawatha Seam), and King 8 (Upper Seam). Future longwall mining will be undertaken in the King 5 (A Seam) and King 8 (Upper Seam).

BEAR CANYON AND TRAIL CANYON MINES (CO-OP MINING COMPANY)

Co-Op Mining Company owns two mines located south of the Plateau Mining Company and Hiawatha Mines Complex permit areas.

The Bear Canyon Mine encompasses 1051 acres. Mining during the first five-year permit term will occur in the Bear Canyon coal seam and thereafter, in the Hiawatha seam. There are two federal coal leases designated as LMUs at the Bear Canyon Mine, U-024316 and U-024318. Production will be from room and pillar mining methods with secondary pillaring.

The Trail Canyon Mine, located immediately west of the Bear Canyon property, has been operated by Co-Op Mining Company since 1938. Production to date has been from the Bear Canyon coal seam. The Trail Canyon Mine was declared suspended during 1983 and will be reclaimed.

DEER CREEK WASTE ROCK STORAGE FACILITY

The Deer Creek Waste Rock Storage Facility permit area encompasses 52.56 acres and is located approximately 2 miles northeast of the Deer Creek Mine. This area will store waste rock from the Deer Creek Mine for at least 30 years. Utah Power and Light Company is owner of all the land within the permit area.

IV. STUDY AREA

GEOLOGY

The Gentry Mountain CIA is characterized by cliffs, narrow canyons and pediments. Stratigraphic units outcropping within the area include, from oldest to youngest, the Mancos Shale, Starpoint Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Formation and Quarternary deposits. Lithologic descriptions and unit thicknesses are given in Figure 3.

Rocks in the study area strike northwest and dip approximately three degrees to the southeast. Four major normal faults or fault zones (Pleasant Valley Fault, Trail Canyon Fault, unnamed fault, Bear Canyon Fault) trend north in the western portion of the CIA (Figure 4). Displacements range from several feet to approximately 800 feet.

HYDROLOGIC RESOURCES

GROUND WATER

The ground-water regime within the CIA is dependent upon climatic and geologic parameters that establish systems of recharge, movement and discharge.

Snowmelt at higher elevations provides most of the ground-water recharge, particularly where permeable lithologies such as fractured or solution limestone are exposed at the surface. Vertical migration of ground water occurs through permeable rock units and/or along zones of faulting and fracturing. Lateral migration initiates when ground water encounters impermeable rocks and continues until either the land surface is intersected (and spring discharge occurs) or other permeable lithologies or zones are encountered that allow further vertical flow.

The Star Point Sandstone and lower portion of the Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone, and Quarternary deposits are potential reservoirs or conduits for ground water in the CIA. Reservoir lithologies are predominantly sandstone and limestone. Sandstone reservoirs occur as channel and overbank, lenticular and tabular deposits, whereas limestone reservoirs have developed

System	Series	Stratigraphic Unit	Thickness (feet)	Lithology and Water-Bearing Characteristics
Quaternary	Holocene and Pleistocene	Quaternary deposits	0-100	Alluvial and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Paleocene	North Horn Formation	300 ±	Varigated shale and mudstone with interbeds of tan-to-gray sandstone; all of fluvial and lacustrine origin; yields water to springs.
Cretaceous	Upper Cretaceous	Price River Formation	200-250	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Sandstone	150-200	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures; yields water to springs locally.
		Blackhawk Formation	1000 ±	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured or jointed.
		Star Point Sandstone	350-450	Light-gray, white, massive, and thin bedded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs and mines where fractured and jointed.
		Mancos Shale	1000 ±	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.

Figure 3. Stratigraphy of the Gentry Mountain Area (modified from Plateau Mining Company PAP, 1986, and Danielson, et al., 1981).

through solution processes and fracturing. Shale, siltstone and cemented sandstone beds act as aquacludes to impede ground-water movement. The Mancos Shale is considered a regional aquaclude that delimits downward flow within the CIA. Localized aquacludes include relatively thin, impermeable lithologies occurring within the stratigraphic section above the Star Point Sandstone.

The Star Point-Blackhawk aquifer is present and represents the only identified regional ground-water resource in the study area (Danielson, et al., 1981). Ground water associated with the Price River Formation and North Horn Formation may be characterized as occurring within an extensive "perched" aquifer zone and represents a significant hydrologic resource.

Faults and fractures act as effective conduits for ground water and allow unsaturated downward flow. Springs having significant discharges (10 gpm or greater) are most commonly located in proximity to major north-south trending fault or fracture zones (Figure 4). In particular, Bear Canyon Fault appears to act as a significant conduit for ground water. Mine workings contact with the Bear Canyon Fault at the 10th West Section in U.S. Fuels' King IV Mine has resulted in a sustained inflow of 900 to 1,000 gpm.

Other encounters with the Bear Canyon Fault in Plateau Mining Company's Star Point No. 1 Mine resulted in an initial high inflow rate that subsequently diminished. Three municipal wells (Huntington) have been developed adjacent to the Trail Canyon Fault near the junction of Wild Cattle Hollow and Gentry Hollow (Figure 4).

Data from seven boreholes located within and adjacent to the Star Point Mines permit area indicate ground water associated with the regional aquifer moves toward the south (Figure 4).

Approximately 325 seeps and springs occur within the CIA. Total spring discharge exceeds 1,500 gpm. One hundred eighty-nine springs discharge from the North Horn Formation and Price River Formation (1,200 gpm); 37 springs discharge from the Castlegate Sandstone (80 gpm); 53 springs discharge from the Blackhawk Formation and Star Point Sandstone (200 gpm); and eight springs discharge from the Mancos Shale (40 gpm). Analyses from spring samples indicate water quality progressively decreases from the North Horn Formation to the Mancos Shale.

Mine inflow is estimated to be 134 gpm in the Star Point Mines, 950 gpm in the Hiawatha Mines Complex, and less than 100 gpm in the Trail Canyon Mine and Bear Canyon Mine. The majority of mine inflow (80 percent) is from faults and fractures with a lesser amount from paleochannels and wall weeps. Mine inflow is discharged to Mud Water Canyon at Star Point Mines and to Cedar Creek and Miller Creek at the Hiawatha Mines Complex. Mine inflow is discharged to Bear Creek at the Bear Canyon Mine. No discharge occurs at the Trail Canyon Mine. Mine water within the CIA represents ground-water depletion from storage in the Blackhawk Formation and Star Point Sandstone and the interception of flow along faults/fractures.

Surface Water

The CIA has been divided into six major drainage basins representing seventeen sub-drainage areas. The CIA encompasses drainage to both the San Rafael and Price River Basins (see Figure 5 and Table 1).

Serviceberry Creek Drainage (1)

The Serviceberry Creek Drainage (1) includes the majority of disturbed area associated with the Plateau Mine. The mine exists in the headwaters of this creek drainage area of 6,135 acres. The average gradient of the creek within the CIA is 21 percent. Serviceberry Creek (1) is ephemeral within the CIA and eventually joins Miller Creek (16), east of the CIA, which is a perennial creek.

Vegetation communities in this drainage system include Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Black sage and Big sage associations, Mixed Grass - Forb communities, and Pinyon - Juniper Woodlands. Riparian communities are generally small and may be dominated by willows, River birch or an occasional Cottonwood. Desert Shrub communities, particularly Shadscale, occupy the lowest elevations in the eastern section of the drainage system.

Mining has been confined to the extreme upper reaches of the watershed. The approximately 330 acres of surface disturbance associated with the surface facilities of the Plateau Mine has also been confined to the upper reaches of this watershed. All of Plateau's surface disturbance is treated by maintained sediment controls.

Mud Water Canyon Drainage (2 and 3)

Approximately 2,978 acres drains Mud Water (2) and Los Angeles Canyon (2) to join 7,080 acres draining Seely, Corner, and First Water canyons (3) to form Gordon Creek of the Price River Basin. The average gradient in the headwaters of these drainages is 19 percent. Mining has occurred within the extreme headwater reaches of Mud Water (2), Los Angeles (2), and Seely canyons (3), and the South Fork of Corner Canyon (3). Presently, Mud Water, Seely, and the South Fork of Corner Canyon are perennial in their lower reaches, sustained by high elevation spring flow and mine water discharge (Mud Water Canyon).

Vegetation communities of the Mud Water Canyon Drainage area include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Big sage and Black sage associations, Mixed Grass-Forb communities and shrub and grass-forb dominated riparian communities on the headwater streams.

Mining has not occurred beneath any stream channels, but has been restricted to the ridges separating the drainages.

Gentry Ridge Drainage (4, 5, 6, 7 and 8)

Approximately 7,777 acres drain Wild Cattle Hollow (6) and Gentry Hollow (7) to form Tie Fork Canyon (8) tributary to Huntington Creek. Approximately 5,516 acres drains areas directly tributary to Huntington Creek on Nuck Woodward Canyon (4). The average gradient of Gentry (7) and Wild Cattle Hollow (6) is 13 percent. Tie Fork Canyon's gradient is 44 percent. Miscellaneous side tributaries to Huntington creek (Pole Canyon, McElprang Canyon, Vicks Canyon, Grange Hole, Biddlecome Hollow) (5) have average gradients of 40-50 percent.

All of the ephemeral drainages are not within the range of current underground mining plans. Portions of the Gentry Hollow (7) and Wild Cattle Hollow (6) drainage areas will be mined under within current mining sequences. Portions of the Gentry Hollow drainage area have been mined under by the Hiawatha Mine. Wild Cattle Hollow's main channel will not be mined under but longwall panels of the current Plateau Mine sequence will abut the channel as the mine progresses in a southwesterly direction. Both Gentry Hollow and Wild Cattle Hollow are designated perennial creeks on the U.S. Geological Survey quadrangle map.

Vegetation communities of the Gentry Ridge Drainage area include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Big sage and Black sage associations, Mixed Grass-Forb communities and a variety of riparian communities. The latter range from Cottonwood dominated associations along Huntington Creek to narrow bands of dense fir in the bottoms of steep canyons.

Bear Creek - Train Creek Drainage (9, 10, 11, 12 and 13)

Approximately 8,620 acres of drainage contribute to Trail Canyon (9), Bear Canyon (10), and three miscellaneous tributaries to Huntington Creek (11, 12, 13). The average gradient of Trail and Bear Canyon is approximately 20-25 percent. The average gradient of the miscellaneous tributaries ranges from 40 to 70 percent.

Bear Creek (10) is characterized by steep gradients, narrow canyons, and large sediment loads (28, 092 mg/l Total Suspended Sediments (TSS) measured during a major storm event). Trail Creek (9) is characterized by steep gradients, narrow canyons, and good water quality. Mining occurs above Trail Creek.

About 10 acres of mine surface disturbance occurs in both Bear and Trail canyons. An additional 3 acres are associated with the living quarters and surface facilities of Co-Op Mining Company. The Trail Canyon Mine is currently in the process of being permitted for reclamation. No future disturbance is planned for either mine, other than reclamation of the Trail Canyon site.

Vegetation communities in this drainage system include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, dominated by Black sage associations, Mixed Grass-Forb communities with Salina wildrye and Bluebunch wheatgrass dominants, Pinyon-Juniper Woodlands and a variety of riparian communities including the Huntington and Trail Creek Narrowleaf Cottonwood and willow associations.

Cedar Creek - Fish Creek Drainage (14 and 15)

Approximately 19,289 acres drain both the Cedar Creek (15) and Fish Creek (14) drainage areas. The average gradient of Fish Creek is 19 percent and the average gradient of Cedar Creek is 13 percent. Both Cedar Creek and Fish Creek are ephemeral drainages with Cedar Creek exhibiting perennial characteristics in certain reaches due to mine water discharge and spring flow. The Hiawatha Mines Complex permit area encompasses portions of the Right and Left of Cedar Creek. The Right Fork is ephemeral and the Left Fork exhibits perennial characteristics in certain reaches.

Vegetation communities in this drainage system include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Black sage and Big sage associations, Mixed Grass-Forb communities, Pinyon-Juniper Woodlands, riparian communities which include Narrowleaf cottonwood, Sandbar willow (Salix exigua) and River birch (Betula occidentalis), and Desert Shrub communities at the lowest elevations in the southeastern section of the drainage system.

Surface facilities associated with the Mohrland Mine of U.S. Fuels Company are adjacent to Cedar Creek, and a major mine discharge of 500-1,000 gpm occurs at the low point of the Mohrland Mine. Surface facilities disturb less than 25 acres of this drainage area.

Miller Creek - Sand Wash Drainage (16 and 17)

Miller Creek (16) and Sand Wash (17) encompass 18,053 acres of the CIA drainage area. Miller Creek has an average gradient of 15 percent and the Sand Wash has an average gradient of 17 percent. The upper reaches of Sand Wash and the Right and Left Forks of Miller Creek contain approximately 350 acres of the surface facilities disturbance of the Hiawatha Mines. These include permanent diversion of a portion of Miller Creek to accommodate the coal processing waste pile. Miller Creek has been mined under by the Hiawatha Mines Complex. Plateau Mining company will mine under the upper reaches of the North Fork of the Right Fork (NERF) Miller Creek. NERF is perennial and therefore, the North Fork of Miller Creek is also a perennial stream, whereas the Middle Fork and Left Fork of Miller Creek are ephemeral.

Vegetation communities in this drainage system include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Black sage and Big sage associations, Mixed Grass-Forb communities, and Pinyon - Juniper Woodlands. Riparian communities are generally narrow bands at the edge of intermittent and perennial streams or springs and may be dominated by willows, River birch or an occasional Cottonwood. Riparian zones of the headwaters may be distinguished from the uplands primarily by density and vigor of vegetation. Desert Shrub communities, particularly Shadscale with Slender wheatgrass, occupy the lowest elevations in the southeastern section of the drainage system.

V. POTENTIAL IMPACTS

GROUND WATER

Dewatering and subsidence related to mining have the greatest potential for impacting ground-water resources in the CIA. The impact of changes in vegetation or ground-water recharge should be minimal since mining will disturb less than 1,000 acres of the 70,000 acre CIA. Disturbance of phreatophytic vegetation (primarily cottonwoods and some willow) is negligible. The impacts of coal waste disposal on water quality are discussed in the surface water section.

Dewatering. The volume of water being discharged from mines within the CIA (1,200 gpm) approximates the amount of water that is currently being withdrawn from the ground-water system. The current and projected withdrawal values may be totalled and compared to estimates of ground-water discharge and recharge within the CIA and thereby, allow an assessment of cumulative dewatering impacts.

Approximately 37,000 acres within the CIA overlie the coal resource and represent a potential recharge area (Figure 6). Average annual precipitation is approximately 20 inches over the potential recharge area and hence, the total annual precipitation over the outcropping recharge area is 64,000 acre-feet.

Table 2A gives estimates for the total annual discharge of springs from water-bearing rock units that overlie the coal resource. Discharge also occurs directly to perennial streams where channels intersect ground water within the Blackhawk Formation and Star Point Sandstone. Table 1 identifies the ten perennial streams that occur within the CIA. Nine of these streams intersect the lower Blackhawk Formation and Star Point Sandstone. A study conducted along the NFRF Miller Creek (16) indicates streamflow substantially increased (from 8 to 115 gpm) as a result of discharge from the Blackhawk Formation and Star Point Sandstone (Plateau Mining Company PAP, page 783-40). The results from the Miller Creek study suggest the other eight perennial streams that traverse the regional aquifer also sustain ground-water discharge (or base flow recharge). Accordingly, total base flow recharge to perennial streams within the CIA is estimated to be 900 gpm.

Table 2A. Precipitation and Spring Discharge Estimates for Areas above the Coal Resource, Gentry Mountain, CIA.

Lithologic Unit(s)	Outcrop Area (Acres)	Normal Annual Precipitation on Outcrop (Acre-Feet)	Acre Feet	Total Annual Discharge of Springs Percent of Normal Annual Precipitation on Outcrop
Undivided Flagstaff Limestone, North Horn Formation, Price River Formation	19,500	34,125	1,900	.05
Castlegate Sandstone	3,000	5,250	129	.02
Blackhawk Formation, Star Point Sandstone	<u>14,900</u>	<u>26,075</u>	<u>322</u>	<u>.01</u>
TOTAL	37,400	64,450	2,351	.04

Table 2B. Estimated Ground-water Discharges to Perennial Streams and Wells and from Mines, Gentry Mountain, CIA.

Discharge to Perennial Streams (9 total)	990 gpm
Discharge to Huntington Municipal Wells (3 total)	100 gpm
Discharge from mines (2 total)	<u>1,200 gpm</u>
TOTAL	2,200 gpm

Table 2C. Approximate Atmospheric Discharges from Active Mines, Gentry Mountain, CIA.

Mine(s)	Ventilation Rate (cfm)	Approximate Discharge Rate (gpm)
Bear Canyon	150,000	10
Star Point Mines	650,000	44
Hiawatha Mines Complex	<u>350,000</u>	<u>24</u>
TOTAL	1,150,000	88 gpm

Table 2B lists estimated ground-water discharges to perennial streams and wells and from mines. Table 2C approximates the amount of ground water discharged to the atmosphere by mine ventilation systems. Psychrometric formulas were utilized to derive ventilation discharge values and extrapolated to the mine elevations. Average relative humidity data from the Central Weather Station in the Manti-LaSal National Forest were also used in the psychrometric calculations.

Total ground-water discharge within the CIA (summed from Tables 2A, 2B, and 2C) is currently about 3,800 gpm, where 63 percent (2,400 gpm) of the total represents natural discharge to stream and springs and 34 percent (1,500 gpm) results from mining activities. The remaining 3 percent (100 gpm) may be attributed to well discharge.

Lines (1985) investigated the Trail Mountain area and indicated regional aquifer inflow to mines is derived from aquifer storage (80 percent) and aquifer discharge (20 percent). Extrapolating these percentages to the Gentry Mountain CIA (16 miles) allows depletion, due to present mining activities (7,200 acres mined) of regional aquifer storage and discharge to be estimated at 360 and 90 gpm, respectively. Assuming future mining encompasses 3,300 acres and will continue to encounter steady-state inflow from the regional aquifer, then depletion would increase to 471 gpm for storage and 118 gpm for discharge.

The Hiawatha Mines Complex has encountered major ground-water inflow associated with the Bear Canyon Fault. Diversion of flow from this conduit has altered and will continue to alter (deplete up to 1,000 gpm) recharge to the regional aquifer and, possibly, surface discharge in the Gentry Hollow area. Future development in the Hiawatha Mines Complex will retain a barrier pillar adjacent to the Bear Canyon Fault. Plateau Mining Company has proposed to access coal reserves beneath Gentry Ridge by driving a rock tunnel across the Bear Canyon Graben and associated western (unnamed) and eastern (Bear Canyon) boundary faults. Previous encounters with the Bear Canyon Fault (eastern) in the Star Point Mines have resulted in limited inflow. Data are not available to assess whether the western (unnamed) boundary fault acts as a significant groundwater conduit. A pressure grouting program will be initiated if the tunnel encounters inflow(s) that exceed 50 gpm for more than three months. Thus, tunnel development may result in a maximum diversion of flow from the two Bear Canyon boundary faults that will not exceed a total of 100 gpm.

Future mining-induced dewatering is projected to encompass 141 gpm and hence, the cumulative dewatering total would be approximately 1,650 gpm. Following the cessation of mining, the discharge of ground water to Mud Water Canyon (2), Cedar Creek (15), Miller Creek (16), and the atmosphere, will cease and workings will begin to flood.

The impact associated with the reduction in surface flow is considered temporary. Mine flooding will conceivably recharge regional aquifer storage and re-establish the natural ground-water conduit system that was operational prior to mining. The maximum time span required for complete mine flooding may be derived by assuming the final workings (10,500 acres) will remain open (average 5 foot height) and caving will not occur. Accordingly, for workings that experience inflow (Hiawatha Mines Complex, Bear Canyon Mine, Trail Canyon Mine, Star Point Mines) an upper limit of 20 years may

be derived for complete mine flooding. It should be noted that complete flooding will, undoubtedly, never be achieved because the hydraulic head generated as flooding proceeds will increase until the hydraulic properties of the roof, floor and rib are exceeded and flow within the rocks initiates.

Subsidence. Subsidence impacts are largely related to extension and expansion of the existing fracture system and upward propagation of new fractures. Inasmuch as vertical and lateral migration of water appears to be partially controlled by fracture conduits, readjustment or realignment in the conduit system will inevitably produce changes in the configuration of ground-water flow. Potential changes include increased flow rates along fractures that have been "opened", and diverting flow along new fractures or within permeable lithologies. Subsurface flow diversion may cause the depletion of water in certain localized aquifers and potential loss of flow to springs that will be undermined. Increased flow rates along fractures would reduce ground-water residence time and potentially improve water quality.

Mining will occur beneath approximately 80 springs that have a combined flow in excess of 400 gpm. Overburden thickness averages more than 1,000 feet beneath areas where springs are located. Diversion of spring flow is considered to be at overall low risk.

Mining will occur beneath a portion of NFRF Miller Creek where overburden thickness ranges from 500 to 825 feet. The risk for development of tension cracks within the stream channel is considered to be moderately high.

SURFACE WATER

The cumulative impacts associated with mining within the CIA will be summarized by individually discussing impacts associated with the Star Point Mines, Hiawatha Mines Complex and Bear Canyon Mine and Trail Canyon Mine. Creeks or drainage areas which are referenced by (#) or discussed, are shown on Figure 5, Surface Water Drainage Map.

Star Point Mines. The Plateau Mining Company's surface facilities are primarily found in Sage Brush Canyon tributary to Serviceberry Canyon (1). Sage Brush Canyon and Serviceberry Canyon flow only in response to storm events.

The coal processing waste pile (Figure 4) at the Star Point Mines is at 7,400 foot elevation, annual precipitation is 12 inches, and the vegetation surrounding the waste pile are salt desert shrub and pinyon-juniper-sagebrush communities. The waste pile is not adjacent to any perennial streams or known ground-water resources. The mine presently produces 1.2 million tons of coal annually with a capacity of four million tons. Twenty percent of the material mined is processing waste.

Table 64 of the PAP indicates waste materials are sandy or coarse in nature, with a high organic matter content and have a relatively high cation exchange capacity for coarse textured materials. To date, six waste samples have been analyzed for acid-base potential. One sample had a potential to be acid-forming. The other samples tested had excess base, which should be sufficient to neutralize drainage or seepage from areas which could potentially form acid. The alluvium which underlies the coal waste is calcareous and will also neutralize any acid drainage from the refuse.

Selenium was the only parameter tested for in the waste which had concentrations above suspect levels. This suspect concentration is .1mg/kg and is for toxicities which may occur to animals feeding on vegetation grown on this material. The suspect value which may be detrimental to water quality is not known. Selenium in the coal waste should not be a concern to water quality because drainage from the pile should be minor. The waste, although hauled to the pile in a wet form is not a slurry, and most of the water associated with the waste evaporates in the dry climate of the area.

Data given in Table 64 indicate waste could contribute slightly to increasing TDS levels in surface or ground water. The electrical conductivities of four samples were saline (greater than 4mmhos/cm²).

Although most water associated with the waste will evaporate, some water will inevitably percolate through the pile and underlying alluvial deposits. Eventually, seepage would contact the Mancos Shale and further degradation of water quality would take place. Accordingly, drainage from the waste pile would have little down gradient effect.

All surface water drainage is treated by running disturbed area drainage through sediment ponds. There are no water rights within or adjacent to the mine plan area that could be impacted by operation of surface treatment facilities. Runoff conveyance systems and treatment facilities have been designed to minimize the amount of area that is tributary to the sediment ponds. The quantity of runoff detained by sediment ponds is minimized by diversion of undisturbed waters (PAP, page 784-62).

The Plateau treatment facilities have operated in compliance with all NPDES discharge limitations except for TDS exceedence at the Mud Water Canyon Mine Water and Sediment Pond No. 8. Requests for modifications to the limits currently in effect have been made for these facilities but not yet granted by State Health and EPA. The current TDS limitation for the Mud Water Canyon (2) discharge is 650 mg/l TDS. The request to raise this limit to 1,450 mg/l (an average of the naturally occurring concentration of the Mud Water Canyon stream) has been made. The average annual flow for the period of 4/85 through 3/86 is approximately 129 gpm to Mud Water Canyon, associated with the Mine Water Discharge (PAP, page 783-46). Of 15 TDS samples taken from the Mud Water Canyon

discharge in 1985, the TDS concentration varied from a low of 598 mg/l taken in late May to a high of 772 mg/l taken in late October. The sample mean was 689 mg/l with a standard deviation of 53 mg/l. TDS effluent concentrations at Pond No. 8 have been recorded as high as 3,913 mg/l on March 10, 1986. An undisturbed area sample taken on the same day near Pond No. 8 discharge was 6,024.0 mg/l. Plateau Mining Company is in the process of monitoring inflows to Pond No. 8 for a one-year period (PAP, page 784-79).

The effects of the discharge associated with Plateau Mining Company's mine water result in approximately 485.62 Tons/Yr of dissolved solids being added to the surface water system tributary to the Price River and to the Colorado River. This is based on average data for the period of 1/22/86 through 12/18/86 taken from the mine water discharge point.

Of the potential discharge locations (Treatment Facility No. 1, Ponds 2 through 8, and Mud Water Canyon discharge) only five facilities have available water quality data. These include discharges from Ponds 4, 5, 6 and 8, and Mud Water Canyon discharge.

Summary of Water Quality Data

Mean Values	Total Dissolved Solids (mg/l)	Total Suspended Solids (mg/l)	Period
Pond No. 4	1531.7	38.5	10/83- 9/85
Pond No. 5	791.1	33.0	4/83-10/85
Pond No. 6	1037.2	18.5	4/83- 9/85
Pond No. 8	1846.3	25.0	7/85

All four of the facilities drain to an ephemeral drainage; Serviceberry Creek (1), and then to Price River, tributary to the Colorado River. Background TDS values for the lower parts of this drainage have been measured at 7,300 mg/l. The discharges from the ponds listed above are less than background TDS measured at Surface Water Station 10-1 in Sage Brush Canyon (1) downstream of the ponds. The average value for TDS at this station in 1985 was 1,932 mg/l. The values ranged from 599 mg/l on 6/13/85 to 3,168 mg/l on 6/27/85. The lowest TDS value is reflective of runoff occurring during a snowmelt period. Figure 14 in the Plateau PAP shows examples of this snowmelt dilution effect. The TSS data given in the above table indicates that Pond No. 4, 5, 6, and 8 have operated in compliance with the 70 mg/l limit identified in their NPDES permit.

Plateau Mining Company has committed to providing an adequate surface water reclamation plan for the Star Point Mine by October 1, 1987. This plan will identify the necessary measures to provide for contemporaneous reclamation of the disturbed areas preventing impacts to the quality and quantity of surface water. In addition, the use of adequate sediment controls mitigates the overall effects

of mining on the surface water system. The effects of discharging mine water into the Mud Water Canyon drainage will be determined by maintaining an effective monitoring system to determine if any adverse impacts to the environment would occur and could be prevented.

As mentioned in the previous section on subsidence, the Star Point Mines will mine a portion of the headwaters of the NFRF Miller Creek (16) and the risk for development of tension cracks within the stream channel is considered to be moderately high. Because of this potential impact, the Plateau Mining Company will be required to develop a sophisticated monitoring system to detect any changes in the hydrologic regime of this stream channel during and after mining. This monitoring system will include identification of gaining and losing reaches through stream surveys and the installation of a continuous monitoring system directly below the area of potential impact.

Plateau Mining Company will use one of the following engineering methods to mitigate any change to the hydrologic regime of the NFRF Miller Creek if an impact is detected through monitoring.

1. Seal the cracks in the stream channel with bentonite or other environmentally safe materials.
2. If cracks are too large, rags or some other material will be hand placed in them at a depth of approximately two feet to provide a stop point for bentonite pellets.
3. Concrete or epoxy mixtures.
4. Surface stabilization accomplished by hand tools.

Implementation of one of these engineering methods will occur following the diversion of surface flow around the impact area by culvert, flexible fabric tubing or plastic liners and an assessment and approval of the appropriate engineering method to mitigate impact to the stream channel.

Hiawatha Mines Complex. In the vicinity of the Hiawatha Mines Complex, the CIA is dissected by two drainage systems, Miller Creek (16) and Cedar Creek (15). The drainage area for Miller Creek above the confluence with Serviceberry Creek (1), is about 29,700 acres. Streamflow in Miller Creek is perennial from the headwaters of NFRF Miller Creek. Cedar Creek is also a perennial stream with a drainage area of approximately 5,300 acres. Cedar Creek receives approximately 800 gpm of discharge from the old Mohrland Mine portal located south of the Hiawatha Mines Complex.

Mine water is used by U.S. Fuels Company for fire prevention and dust suppression in King 4 Mine and by the town of Hiawatha for culinary purposes. These uses are covered by water rights claimed by U.S. Fuels Company for 4,758 gpm (3,746 gpm in surface water rights and 1,012 gpm in ground-water rights). Mine water discharge from the Mohrland Mine portal is regulated under the National Pollutant Discharge Elimination System (NPDES) permit UT-0023094.

Water is piped to the town of Hiawatha (20 gpm) and coal preparation facility (545 gpm) from the mines. The Left Fork of the North Fork of Miller Creek is diverted into an underground water storage reservoir that provides water for the town of Hiawatha. This water, together with the water intercepted in the mine, is stored in the mined-out section of the abandoned Hiawatha No. 2 Mine. Maximum storage volume in this underground reservoir is about 120 million gallons (368 acre-feet). Approximately 60 million gallons (184 acre-feet) are normally stored in this reservoir.

Water in excess of that used in the mining operation is routed south by gravity to the Mohrland Mine Portal where it is collected and piped to the town of Hiawatha. Excess water is discharged into Cedar Creek (15). At the town of Hiawatha there are four water storage tanks with a combined capacity of 245,000 gallons (0.75 acre-feet). Water is treated and then stored in the 40,000 gallon (0.1 acre-feet) tank 5A near the preparation plant.

Coal processing waste piles (Figure 4) at Hiawatha Mines Complex are at 7,200 feet elevation and receive 12 inches of annual precipitation. The vegetation in the refuse area is a mixed salt desert shrub community. The waste piles have been in existence since the 1940's, encompass approximately 133 acres and include 4 slurry ponds. Table XIII-11 of the PAP indicates coal waste samples are above suspect levels for selenium with concentrations ranging from 1.93 to .91 mg/kg. However, the contribution of selenium to ground or surface waters by the coal waste should have minimal effects on water quality. Any seepage from the slurry ponds would flow to Miller Creek because of its proximity and the gradient to the creek. The amount of seepage compared to the flow of Miller Creek would dilute any diletarious concentration of selenium in seepage waters. The average flow of Miller Creek is 428 gpm.

Other parameters listed in table VIII-11 of the PAP were within acceptable limits, except for boron and iron in one sample from slurry pond 3 and 4, respectively. Boron should not pose a problem since this element is of concern in irrigated areas where toxicities can occur in crops. The water quality of adjacent Miller Creek has a high inherent salinity hazard for irrigation waters and should not be used for irrigation without intensive management. Again, the flow of Miller Creek would dilute any boron concentration in seepage water.

Iron is a product of pyrite weathering, and may indicate acid mine drainage. The pH of the sample with the high value was 7.35. At this pH, the material is still buffered and does not indicate acid-forming material. Iron at this pH is also not readily soluable, and therefore, iron should not pose a problem to receiving waters.

The coal waste was not analyzed for acid-base potential, but pH values indicate that the refuse is basic, with only one sample being neutral (pH 6.8). Existing water quality data from Miller Creek, which is adjacent to the waste pile, indicate there are no degrading effects from seepage of the coal waste piles or slurry ponds. Considering the time involved in oxidation of the waste, the calcareous nature of the soils and the buffering capacity of the water in Miller Creek, along with the alkalinity of the slurry pond water (PAP, page 81A), these factors should be great enough to neutralize any acid produced in the coal processing waste piles.

A comparison (PAP, page 81A) of slurry pond water and Miller Creek water sampled adjacent to the slurry ponds shows that the pond water is slightly higher in sulfates, iron, and TDS. Although the slurry water may degrade further with increased contact time with slurry sediments, any seepage should have little consequence on the water quality of Miller Creek. The natural quality of Miller Creek water is poor since it traverses the Mancos Shale. The contribution of salts into the Price River basin by the Mancos Shale has been well documented (Mundorff, 1972; Ponce, 1975; Laronne and Schumm, 1977).

Surface water at a higher elevation in the CIA has a low TDS concentration, usually less than 400 mg/l, and a low TSS concentration, usually less than 30 mg/l. Concentrations of dissolved sodium and chloride are usually less than 15 mg/l. The predominant dissolved chemical constituents are calcium and bicarbonate. Water quality during snowmelt runoff tends to be higher in calcium carbonate and water quality from ground-water discharge tends to have higher concentrations of magnesium and sulphate. Values of pH were fairly constant, ranging from 7.6 to 8.1.

The Utah State Board of Health has established water quality standards to protect against controllable pollution to beneficial use of water. For the Miller Creek basin (16), the pertinent water quality standards are for nongame fish (Class 3c) and irrigation of crops and stockwatering (Class 4) (Utah State Board of Health, 1978).

TDS levels of surface waters immediately below some of the active mine areas exceed the water quality standard for irrigation use, but the effects are mitigated by dilution from undisturbed surface waters. TDS concentrations in Miller Creek are within the water quality standards at the point that it flows out of the Hiawatha Mines Complex permit area; however, TDS concentrations increase about two-fold when comparing above-mining stations and below-mining stations.

Dissolved constituents continue to increase in Miller Creek as water flows across the Mancos Shale. At the junction of Miller Creek and Utah Highway 10 (about 10 miles east of the permit area), TDS concentrations average more than 3,200 mg/l, and the dominant dissolved chemical constituent is sulfate (Mundorff, 1972). The only parameter to exceed pertinent water quality standards is TDS.

The sodium adsorption ratio (SAR) for the area is low. For the headwater areas of the Miller Creek and Cedar Creek drainages, the SAR is less than 0.5. At the base of the Wasatch Plateau, the SAR values are usually between 0.8 and 2.0. On the Mancos Shale, the SAR values range between 1.0 and 4.0. Surface water derived from snowmelt flow usually has a lower SAR value, however, both sodium and SAR increase during the low flow period as streams traverse the Mancos Shale.

Both SAR and TDS combine to degrade irrigation water. All of the water in the study area exhibits a low sodium hazard for snowmelt flows, but Miller Creek at Utah Highway 10 shows a medium sodium hazard during low flow periods. This increase in TDS and SAR as streams cross the Mancos Shale is a natural nonpoint source of pollution.

TDS concentration in surface water below the elevation of coal mining activities are higher than in areas above coal mining activities. TDS increases are associated with increases in sulfate, chloride, magnesium and sodium concentrations. Current TDS levels do not exceed any existing recommended water quality criteria for current water uses. Future mining will cause an increase in TDS concentration, but this level will also be below state and federal water quality criteria. TDS loads (i.e., concentration multiplied by flow rate) are approximately 900 tons per year from nonpoint sources associated with existing mining operations on Miller Creek. Because no new surface disturbances are proposed, the TDS load should not increase in the future. There is no current active surface mining operation on Cedar Creek, but an increase of 180 tons per year from nonpoint sources is projected in relation to future mining operations on Cedar Creek.

Water chemistry of surface waters in the CIA naturally change from a calcium carbonate type to a magnesium type as streams traverse the Blackhawk Formation and the Mancos Shale. The Mancos Shale has a significant impact on surface water quality. TDS concentrations of streams that interact the Mancos Shale area are as much as 100 times higher than TDS levels of streams that interact overlying lithologies within the CIA. Most of these increases are natural and are probably caused by rain and leaching within stream channels or ground water flowing through the formation leaching available salts from the marine shales, and discharging into the surface waters. Impacts resulting from the surface facilities associated with mining in the CIA are overshadowed by the degradation of water quality from streams traversing the Mancos Shales.

Sulfate levels are presently below established water quality standards, and if projected estimates by the mine of sulfate increases are accurate, surface disturbances associated with the King 7 and 8 Mines will cause about a two-fold increase in sulfate concentrations. Projected sulfate concentrations will remain below water quality standards.

TSS concentrations are also higher downstream from surface facilities associated with mining. Most of the increased suspended sediment naturally settles out before Miller Creek or Cedar Creek leaves the permit area because of relatively flat stream gradients. In the Office of Surface Mining Technical Analysis a model was used to route the known water quantity and quality of Miller Creek (16) (at the town of Hiawatha) and of Serviceberry Creek (1) (near the town of Wattis) to the confluence of the two streams. According to the results of the model, the TDS concentration below the confluence of Serviceberry Creek and Miller Creek will exceed the water quality standard for irrigation use during the middle and late summer months. Most of the TDS concentration is caused by the Serviceberry Creek traversing the Mancos Shale, however.

Both concentrations of TSS and TDS are higher downstream than upstream of the mine site and can be attributed to both natural and mine-related causes. The Division considers the Mancos Shale as the major source for surface water contamination.

Bear Canyon Mine and Trail Canyon Mine. The Trail Canyon and Bear Canyon mines' surface facilities are primarily found in the Bear Creek-Trail Creek Drainage Areas (9, 10, 12). Both Trail Canyon and Bear Canyon are perennial streams which flow in response to storm events and maintain a base flow associated with perennial springs. The main concern in terms of water quality deterioration downstream is T.S.S. The TSS concentrations in Bear Creek (10) in 1984 varied from a high of 28,092 (mg/l) in May of 1984 to a low of 122 (mg/l) in September of 1984 with five monthly readings within the 1,000 - 2,000 mg/l range. The suspended sediment concentrations in Trail Creek (9) in 1984 varied from 1,400 mg/l in May of 1984 to a low of 1.0 mg/l. in February of 1984, with seven monthly readings below 100 mg/l. These high TSS values are associated primarily with natural climatic and erosional processes, although a proportion may be attributed to removal of vegetation from roads and mine pads and normal mine operations, e.g., loading coal. Sediment controls do exist for all surface disturbances in both canyons. Therefore, the impact associated with 20 acres of mining disturbance in Trail and Bear canyons is minimized by surface controls (i.e., sediment ponds, diversion ditches, filter fences, dugout ponds, etc.).

VI. SUMMARY

Mine operations within the CIA currently intercept regional aquifer (450 gpm) and fault conduit flow (1,050 gpm) at an approximate rate of 1,500 gpm. Of this total, approximately 630 gpm are consumptively lost to mine ventilation (80 gpm) and evaporation at coal preparation facilities (545 gpm). The remaining 870 gpm are discharged, without interbasin transfer of water, to streams.

Mine water discharges, with the exception of Star Point Mines, meet required effluent limitation.

Future mining operations are designed to avoid interception of fault conduit flow and accordingly, inflow from the regional aquifer is estimated to increase from 450 gpm to 591 gpm. Approximately 80 percent of the inflow will be derived from storage and 20 percent from discharge. Consumptive use is not anticipated to increase. Mine water discharge (1,350 gpm) and ventilation losses (300 gpm) will be discontinued upon cessation of mining. Concomitantly, flooding of abandoned workings will initiate. An upper limit of 20 years has been estimated for complete flooding of workings and re-establishment of the premining ground-water system.

Division of spring flow is considered to be at overall low risk. However, reduction in flow along the upper reach of the NFRF Miller Creek is considered to be at moderately high risk. A generalized mitigation plan has been proposed for minimizing mining-induced impacts to NFRF Miller Creek. Division approval of the method implemented to restore the stream channel will be contingent upon an assessment of the mining induced impacts.

Sediment control measures have been and will be designed and implemented to reduce and stabilize contamination of surface waters.

Following cessation of mining and coal processing, waste piles will be adequately covered with topsoil and all disturbed areas will be stabilized and revegetated to prevent surface water contamination.

Future development in the Wild Horse Ridge and Mohrland areas and/or the recommencement of mining at the Trail Canyon Mine may result in further dewatering of the ground-water system. Permitting of new development will require implementation of sediment control measures that minimize impacts to surface water.

The designs proposed for all anticipated mining operations within the CIA are herein determined to be consistent with preventing damage to the hydrologic balance outside the proposed mine plan areas.

AT102/47-73

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AT102/46-73

**LETTERS
OF
CONCURRENCE**

Dr. Dianne R. Nielson, Director
June 6, 1989
Page 2

Aquatic life, particularly hydrophytes, invertebrates, mollusks and fishes could suffer due to reduced or lost flows. It is even possible that subsidence fractures could expose undesirable mineral deposits to aquatic systems. If such situations were to occur, aquatic and terrestrial animals would either perish or be forced to reduce the size of their use areas. Ultimately, the carrying capacity of the area for wildlife would be reduced.

Reduced or lost flows in surface water systems and ground water systems can negatively impact terrestrial habitats. Mesic habitats (riparian, wetland and aspen types) associated with those systems could be degraded by the reduction or loss of water. In all ecological situations (desert, submontane and montane) riparian or wetland ecosystems due to their high level of biological productivity, limited acreage and intense use of wildlife, represent a critical valued habitat. Similar comments can be made for the aspen habitat in the montane ecological situation.

Beyond problems associated with aquatic systems, subsidence impacts to terrestrial wildlife and habitats are primarily associated with surface movement of the earth. However, methane gas has been known to travel along subsidence fractures to the surface. The escaping gas affects rhizobium in the soil and can kill adjacent rhizobium dependent vegetation.

Subsidence has caused escarpment failures. When raptor nests exist in the escarpments, such failures could be detrimental since raptors typically return to reuse their nests over the years. Where escarpment failure occurs and there are no raptor nests, such failure could create suitable raptor nesting habitat.

Many surface displacement lines from subsidence in Utah's coal mining areas are utilized extensively by big game as travel corridors. These fracture lines, once they become filled, represent a flat trail on which the animals can easily walk around the contours of a mountain or across ridge tops.

Thank you for an opportunity to review and provide comment.

Sincerely,


Timothy H. Provan
Director



State of Utah

Division of State History
(Utah State Historical Society)
Department of Community and Economic Development

Norman H. Bangarter
Governor
Max J. Evans
Director

300 Rio Grande
Salt Lake City, Utah 84101-1182
801-533-5755

April 27, 1989

RECEIVED
MAY 01 1989

DIVISION OF
OIL, GAS & MINING

Mr. Richard V. Smith
Acting Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Recompiled Permit Application Package, Fee Lease Addition, Co-Op Mining
Company, Bear Canyon Mine, ACT/015/025, Folder #2, Emery County, Utah

In Reply Please Refer to Case No. J804

Dear Mr. Smith:

The Utah State Historic Preservation Office received the letter on the above referenced project on April 13, 1989. An archaeological survey of this proposed mine addition in 1984 by Senco-Phenix found no cultural resources in the most likely areas to contain them. The remainder of the mine addition is in steep rugged terrain unlikely to contain archaeological resources.

We, therefore, concur with your recommendation that no known historic properties will be impacted by the project.

This information is provided on request to assist the Division of Oil, Gas and Mining with its Section 106 responsibilities as specified in 36 CFR 800. If you have questions or need additional assistance, please contact me at (801) 533-7039.

Sincerely,

Diana Christensen
Regulation Assistance Coordinator

DC:J804/6895V OFR/NP



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangarter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

August 1, 1989

TO: Rick Smith

FROM: Joseph C. Helfrich 

RE: Compliance Review for Section 510(c) Finding, Co-Op Mining Company,
Bear Canyon Mine, ACT/015/025, Emery County, Utah

As of the writing of this letter, there are no NOV's or CO's which are not corrected or in the process of being corrected. Any NOV's or CO's that are outstanding are in the process of administrative or judicial review. There are no finalized Civil Penalties which are outstanding and overdue in the name of Co-op Mining Company.

Finally, they do not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

jb
MN47/47

143 SOUTH MAIN ST.
P.O. BOX 45838
SALT LAKE CITY, UTAH 84145
FED. TAX I.D. # 87-0217663

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Affidavit of Publication

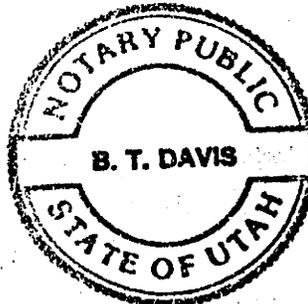
STATE OF UTAH. }
County of Salt Lake }

ss.

I, Don Anderson Hereby certify that the attached advertisement of NOTICE OF FILING AND APPLICATION FOR COAL MINE for CO-OP MINING COMPANY was published by the NEWSPAPER AGENCY CORPORATION, AGENT FOR THE SALT LAKE TRIBUNE and DESERET NEWS, daily newspapers printed in the English language with general circulation in Utah, and published in Salt Lake City, Salt Lake County in the State of Utah.

PUBLISHED ON MAR 30 APR 06 13 20 1989

SUBSCRIBED AND SWORN TO BEFORE ME THIS 21ST DAY OF APRIL 19 89



B. J. Davis
NOTARY PUBLIC

MARCH 1, 1992

COMMISSION EXPIRES
RESIDING IN SALT LAKE COUNTY

NOTICE OF FILING AND APPLICATION FOR COAL MINING PERMIT
Co-op mining Company, Box 1245, Huntington, Utah, here announces its intent to file application for a coal mining permit for an addition to the permitted area of the Bear Canyon mine (ACT/015/025) 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 Division of Oil, Gas and Mining offices, 355 W. North Temple, 3 Triad Center, Salt Lake City, Utah 84080. Written comment on the application should be submitted to the State of Utah, Oil Gas and Mining Division, at the above address. The area to be mined can be found on the USGS Hawthorn quadrangle map. The addition is adjacent to the permitted area and is on private property fee coal area described as follows:
T16S, R7E, S1M Sec 14, SE 1/4
P-29

AFFIDAVIT OF PUBLICATION

STATE OF UTAH }
County of Emery, } ss.

I, Dan Stockburger, on oath, say that I am the General
Manager of the 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).....con-
secutive issues, and that the first publication was on the

...28th...day of... March....., 19..89....

and that the last publication of such notice was in the issue of
such newspaper dated the

...18th...day of... April....., 19..89....

Dan Stockburger

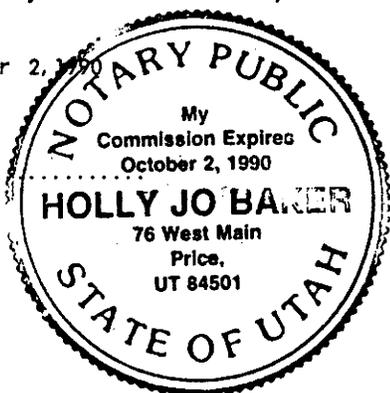
Subscribed and sworn to before me this

...18th...day of... April....., 19..89....

Holly Jo Baker
Notary Public.

My Commission expires October 2, 1990
residing at Price, Utah

Publication fee, \$... 45.60



NOTICE OF FILING AND APPLICATION FOR COAL MINING PERMIT

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Published in the Emery County Progress March 28, April 4, 11 and 18, 1989.

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
(801) 538-5340

COAL RECLAMATION AGREEMENT
--oo0oo--

For the purposes of this RECLAMATION AGREEMENT the terms below are defined as follows:

"PERMIT" (Mine Permit No.) ACT/015/025 (County) Emery

"MINE" (Name of Mine) Bear Canyon Mine

"OPERATOR" (Company or Name) Co-op Mining Company
(Address) 53 West Angelo Avenue
Salt Lake City, Utah 84115

"OPERATOR'S REGISTERED AGENT" (Name) Nathan Atwood
(Address) P. O. Box 1245
Huntington, Utah 84528
(Phone) (801) 748-5238

"COMPANY OFFICERS": Earl W. Stoddard, John Gustafson, R. L. Brown

"BOND TYPE" (Form of Bond) Letter of Credit (Bank)
"BOND" (Bond Amount-Dollars) \$285,067.00
(Year-Dollars) 1990

INSTITUTION Guardian State Bank
POLICY OR ACCOUNT NUMBER 15014194

"LIABILITY INSURANCE" (Exp.) 7/11/89
(Insurance Company) Homestead Insurance

"STATE": Utah (Department of Natural Resources)
"DIVISION": Division of Oil, Gas and Mining
"DIVISION DIRECTOR" Dianne R. Nielson

EXHIBITS:

		Revision Dates		
"SURFACE DISTURBANCE"	Exhibit "A"	_____	_____	_____
"BONDING AGREEMENT"	Exhibit "B"	_____	_____	_____
"LIABILITY INSURANCE"	Exhibit "C"	_____	_____	_____
"STIPULATION TO CHANGE BOND"	Exhibit "D"	_____	_____	_____

RECLAMATION AGREEMENT

This RECLAMATION AGREEMENT (hereinafter referred to as "Agreement") is entered into by the Operator.

WHEREAS, on November 1, 1985, the Division approved the Permit Application Package, hereinafter "PAP", submitted by Co-op Mining Company, hereinafter "Operator"; and

WHEREAS, prior to issuance of a permit to conduct mining and reclamation operations on the property described in the PAP, hereinafter "Property", the Operator is obligated by Title 40-10-1, et seq., Utah Code Annotated (1953, as amended), hereinafter "Act", to file with the Division a bond ensuring the performance of the reclamation obligations in the manner and by the standards set forth in the PAP, the Act, and the State of Utah Division of Oil, Gas and Mining Rules pertaining to Coal Mining and Reclamation Activities, hereinafter "Rules"; and

WHEREAS, the Operator is ready and willing to file the bond in the amount and in a form acceptable to the Division and to perform all obligations imposed by the Division relating to the reclamation of the Property; and

WHEREAS, the Division is ready and willing to issue the subject a mining and reclamation permit upon acceptance and approval of the bond.

NOW, THEREFORE, the Division and the Operator agree as follows:

1. The provisions of the Act and the Rules are incorporated by reference herein and hereby made a part of this Agreement. Provisions of the Act or Rules shall supercede conflicting provisions of this Agreement.

RECLAMATION AGREEMENT

2. The Operator shall provide a legal description of the property including the number of acres approved by the Division to be disturbed by surface mining and reclamation operations during the permit period. The description is attached as Exhibit "A", and is incorporated by reference and shall be referred to as the "Surface Disturbance".
3. The Operator shall provide a bond to the Division in the form and amount acceptable to the Division ensuring the performance of the reclamation obligations in the manner and by the standards set forth in the PAP, the Act and the Rules. Said bond is attached as Exhibit "B" and is incorporated by reference.
4. The Operator shall maintain in full force and effect the public liability insurance policy submitted as part of the permit application. The Division shall be listed as an additional insured on said policy.
5. In the event that the Surface Disturbance is increased through expansion of the coal mining and reclamation operations or decreased through partial reclamation, the Division shall adjust the bond as appropriate.
6. The Operator does hereby jointly and severally agree to indemnify and hold harmless the State of Utah and the Division from any claim, demand, liability, cost, charge, or suit initiated by a third party as a result of the Operator or Operator's agent or employees failure to abide by the terms and conditions of the approved PAP and this Agreement.

RECLAMATION AGREEMENT

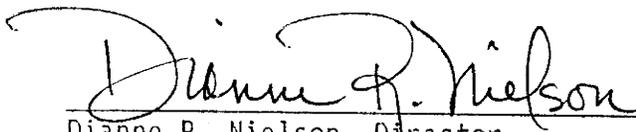
7. The terms and conditions of this Agreement are non-cancellable until such time as the Operator has satisfactorily, as determined by the Division, reclaimed the Surface Disturbance in accordance with the approved PAP, the Act, and the Rules. Notwithstanding the above, the Division may direct, or the Operator may request and the Division may approve, a modification to this Agreement.
8. The Operator may, at any time, submit a request to the Division to substitute the bonding method. The Division may approve the substitution if the bond meets the requirements of the Act and the Rules, but no bond shall be released until the Division has approved and accepted the replacement bond.
9. Any revision in the Surface Disturbance, the bond amount, the bond type, the liability insurance amount coverage, and/or the liability insurance company, or other revisions affecting the terms and conditions of this Agreement shall be submitted on the form entitled "Stipulation to Revise Reclamation Agreement" and shall be attached hereto as Exhibit "D".
10. This Agreement shall be governed and construed in accordance with the laws of the State. The Operator shall be liable for all costs required to comply with this agreement, including any attorney fees.
11. Any breach of the provisions of this Agreement, the Act, the Rules, or the PAP may, at the discretion of the Division, result in an order to cease coal mining and reclamation operations, revocation of the Operator's permit to conduct coal mining and reclamation operations and/or forfeiture of the bond.

RECLAMATION AGREEMENT

12. In the event of forfeiture, the Operator shall be liable for additional costs in excess of the bond amount which are required to comply with this Agreement. Any excess monies resulting from the forfeiture of the bond amount upon compliance with this contract shall be refunded to the appropriate party.
13. Each signatory below represents that he/she is authorized to execute this Agreement on behalf of the named party. Proof of such authorization is provided on a form acceptable to the Division and is attached hereto.

SO AGREED this 11 day of August, 19 89

STATE OF UTAH:

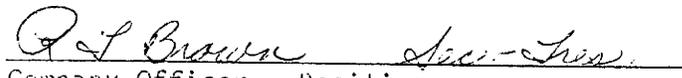


Dianne R. Nielson, Director
Division of Oil, Gas and Mining

OPERATOR:



Company Officer - Position



Company Officer - Position

NOTE: An Affidavit of Qualification must be completed and attached to this form for each authorized agent or officer. Where one signs by virtue of Power of Attorney for a company, such Power of Attorney must be filed with this Agreement. If the principal is a corporation, the Agreement shall be executed by its duly authorized officer.

EXHIBIT "A"
SURFACE DISTURBANCE
LEGAL DESCRIPTION

Exhibit "A" - SURFACE DISTURBANCE
August 1988

Permit Number ACT/015/025
Effective Date _____

SURFACE DISTURBANCE

--000000--

In accordance with the RECLAMATION AGREEMENT, the OPERATOR intends to conduct coal mining and reclamation activities on or within the surface DISTURBANCE as described hereunder:

Total acres of SURFACE DISTURBANCE 10 acres

Legal Description of SURFACE DISTURBANCE:

T16S, R7E, SLBM, Sec. 14: SW $\frac{1}{4}$, SE $\frac{1}{4}$; Sec. 23: E $\frac{1}{2}$, E $\frac{1}{2}$ of NW $\frac{1}{4}$, E $\frac{1}{2}$ of SW $\frac{1}{4}$, SW $\frac{1}{4}$ of SW $\frac{1}{4}$; Sec. 24: All area west of North-South fault; Sec. 25: All area west of North-South fault.

EXHIBIT "B"
BONDING AGREEMENT

Surety Bond
Collateral Bond

EXHIBIT "B"
COLLATERAL BOND
(NON-FEDERAL COAL)

August 1988
Exhibit "B" - BONDING AGREEMENT
COLLATERAL BOND

Permit Number ACT/015/025
Expiration Date JANUARY 6, 1990

(NON-FEDERAL COAL)
COLLATERAL BOND
---oo00oo---

The OPERATOR has provided a(n) letter of credit
(FORM OF COLLATERAL) issued by Guardian State Bank (INSTITUTION)
which names the DIVISION as Beneficiary. This collateral, attached as Exhibit
"B-1", is by this reference incorporated herein, and shall secure the
RECLAMATION AGREEMENT. This undersigned OPERATOR and INSTITUTION hereby
jointly and severally bind ourselves, our heirs, administrators, executors,
successors and assigns unto the State of Utah, Division of Oil, Gas and Mining
in the penal sum of \$ 285,067.00 (COLLATERAL BOND AMOUNT) for the
timely performance of reclamation responsibilities of the SURFACE DISTURBANCE
described in Exhibit "A" of this RECLAMATION AGREEMENT.

Terms for release or adjustment of this COLLATERAL BOND are as written and
agreed to by the DIVISION and the OPERATOR in the RECLAMATION AGREEMENT to
which this COLLATERAL BOND has been attached as Exhibit "B".

If the COLLATERAL hereinabove describes real property, then this bond
shall be filed as a restrictive covenant, upon said property and shall run
with the land.

August 1988
Exhibit "B" - BONDING AGREEMENT
COLLATERAL BOND

So agreed this 30 day of May, 19 89.

FOR THE OPERATOR:

Co-op Mining Company
Operator - (Company)

R J Brown Sec Tres
Company Officer - Position

John Mustipan Vice Pres
Company Officer - Position

FOR THE INSTITUTION:

Guardian State Bank
(Bank or Agency)

Kent Francis Loan Officer
Officer - Position Kent Francis - Loan Officer

ACCEPTED BY THE STATE OF UTAH:

Director, Division of Oil, Gas and Mining

NOTE: An Affidavit of Qualification must be completed and attached to this form for each authorized agent or officer. Where one signs by virtue of Power of Attorney for a company, such Power of Attorney must be filed with this Agreement. If the principal is a corporation, the Agreement shall be executed by its duly authorized officer.



RECEIVED
JAN 22 1988

DIVISION OF
OIL, GAS & MINING

IRREVOCABLE LETTER OF CREDIT

January 6, 1988

State of Utah
Division of Oil, Gas and Mining
State Capitol Building
Salt Lake City, Utah 84114

Re: C. W. Mining dba Co-op Mining

Gentlemen:

We hereby authorize you to draw on Guardian State Bank, 3856 West 5400 South, Salt Lake City, Utah 84118 by order of C.W. Mining Company dba Co-op Mining Company (hereafter referred to as "Co-op") and for the account of Co-op up to an aggregate amount of \$261,122.00 available by your drafts at sight accompanied by a signed statement from your division that Co-op has failed to conduct appropriate reclamation activities and that the State will therefore use the funds as necessary to complete the reclamation activities on the mining property located in Bear Canyon, Emery County.

It is a condition of this letter of credit that it will be automatically extended for additional periods of up to one (1) year from the then relevant expiry date, unless sixty (60) days prior to that relevant expiry date, we, Guardian State Bank, notify you, the Division, that we, Guardian State Bank, elect not to extend this letter of credit, whereupon you, the Division, may elect either to obtain cash collateral by drawing your one sight draft on us for an amount not to exceed the unused balance of this letter of credit, or to let the letter of credit expire. The initial expiration date of this letter of credit is January 6, 1990.

Each draft must state that it is "drawn under Letter of Credit of Guardian State Bank #15-01419-4 dated January 6, 1988" and the amount endorsed on this letter of credit.

We hereby agree with the drawers, endorsers and bona fide holder of all drafts drawn under and in compliance with the terms of this credit, that such drafts will be duly honored upon presentation to the drawee.

Guardian State Bank agrees to inform the Division of any event which would jeopardize the validity of their letter of credit, including the bank's ability to pay pursuant to the terms hereof or the expiration of their letter of credit by agreement between Co-op and Guardian State Bank; and that we, Guardian State Bank, send our notification to you, the Division, at the above-listed address by registered mail (return receipt requested) dated not less than sixty (60) days prior to expiration.

The undersigned has read and understands the regulation regarding letters of credit.

This letter of credit is not transferrable.

Except so far as otherwise expressly stated, this credit is governed by the Uniform Customs and Practices for Commercial Documentary Credits fixed by the Thirteenth Congress of the International Chamber of Commerce (1974 Revision, Brochure 290).

Very truly yours,

Guardian State Bank



Conway K. Hansen
Executive Vice President



RECEIVED
DEC 06 1988

DIVISION OF
OIL, GAS & MINING

December 2, 1988

TO WHOM IT MAY CONCERN:

RE: ADDENDUM TO LETTER OF CREDIT NO. 15014194 - C. W. Mining Company

We hereby increase the Letter of Credit in the amount of \$23,945.00 as of December 2, 1988. The maturity date is January 6, 1990.

Sincerely,

A handwritten signature in cursive script that reads 'C. Kenneth Snow'.

C. Kenneth Snow
Vice President

CKS: saw

EXHIBIT "C"
LIABILITY INSURANCE

August 1988

CERTIFICATE OF LIABILITY INSURANCE
Issued To:
State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
--oo0oo--

THIS IS TO CERTIFY THAT:

Homestead Insurance

(Name of Insurance Company)

535 West Broadway, Council Bluff, Iowa 51503

(Home Office Address of Insurance Company)

HAS ISSUED TO:

Co-op Mining Company

(Name of Permit Applicant)

Bear Canyon Mine

(Mine Name)

ACT/015/025

(Permit Number)

CERTIFICATE OF INSURANCE:

~~021522~~ GL 09912

(Policy Number)

7/11/88

(Effective Date)

UNDER THE FOLLOWING TERMS AND CONDITIONS:

Per UMC/SMC Part 800.60 Terms and Conditions for Liability Insurance;

- A. The Division shall require the applicant to submit as part of its permit application a certificate issued by an insurance company authorized to do business in the state of Utah certifying that the applicant has a public liability insurance policy in force for the surface coal mining and reclamation operations for which the permit is sought. Such policy shall provide for personal injury and property damage protection in an amount adequate to compensate any persons injured or property damaged as a result of the surface coal mining and reclamation operations, including the use of explosives and who are entitled to compensation under the applicable provisions of state law. Minimum insurance coverage for bodily injury and property damage shall be \$300,000 for each occurrence and \$500,000 aggregate.

August 1988
CERTIFICATE OF LIABILITY INSURANCE

- B. The policy shall be maintained in full force during the life of the permit or any renewal thereof, including the liability period necessary to complete all reclamation operations under this chapter.
- C. The policy shall include a rider requiring that the insurer notify the Division whenever substantive changes are made in the policy including any termination or failure to renew.

IN ACCORDANCE WITH THE ABOVE TERMS AND CONDITIONS, and the Utah Code Annotated 40-10-1 et seq., the Insurance Company hereby attests to the fact that coverage for said Permit Application is in accordance with the requirements of the State of Utah and agrees to notify the Division of Oil, Gas and Mining in writing of any substantive change, including cancellation, failure to renew, or other material change. No change shall be effective until at least thirty (30) days after such notice is received by the Division. Any change unauthorized by the Division is considered breach of the RECLAMATION AGREEMENT and the Division may pursue remedies thereunder.

UNDERWRITING AGENT:

Susan Goldberg
(Agent's Name)

(801) 364-3434
(Phone)

AMERICAN INSURANCE & INVESTMENT CORP.
(Company Name)
408 SOUTH 4th EAST
P. O. BOX 8489
SALT LAKE CITY, UTAH 84108
(Mailing Address)

(City, State, Zip Code)

AFFIDAVITS OF QUALIFICATION

