

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

PacifiCorp
Deer Creek Mine
ACT/015/018
Rilda Canyon Lease Extension
Emery County, Utah

October 27, 1994

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File in:

Confidential

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In C: 0150018 Outgoing
Date: 11031994 For additional information

Refer to Record: 0005



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340
801-359-3940 (Fax)
801-538-5319 (TDD)

November 3, 1994

Mr. Richard E. Dawes, Chief
Division of Federal Programs
Office of Surface Mining
Reclamation & Enforcement
1999 Broadway, Ste. 3320
Denver, CO 80202-5733

Re: Rilda Canyon Lease Extension; Deer Creek Mine, PacifiCorp, ACT/015/018,
Folder #2, Emery County, Utah

Dear Mr. Dawes:

Enclosed please find the Decision Document for the Rilda Canyon Lease Extension. The timing for the approval of this lease extension has become critical due to the fact that burn coal has been encountered which cannot be mined in areas that were previously approved for longwall mining. In addition to the Decision Document, I am also enclosing recent correspondence between the Bureau of Land Management, Price Coal Office and PacifiCorp that outlines the events and critical nature of this permitting action.

Very truly yours,

A handwritten signature in black ink, appearing to read 'James W. Carter', written over a circular stamp or mark.

James W. Carter
Director

Enclosure

cc: Pamela Grubaugh-Littig



ADMINISTRATIVE OVERVIEW

PacifiCorp
Deer Creek Mine
Rilda Canyon Lease Extension
ACT/015/018
Emery County, Utah

October 27, 1994

PROPOSAL

PacifiCorp submitted an application for the Rilda Canyon Lease Extension (which included Leases U-7653, U-47977, U-06039, SL-050862, a part of federal lease U-06039, and state lease (ML-22509) for a total of 2371.6 acres on February 12, 1990 and resubmitted an application on February 8, 1994. This submittal was revised on June 27, 1994 as an incidental boundary change to include development mining only in U-06039, U-47977, and SL-050862 (approximately 100,000 tons) and longwall mining in the Second, Third and Fourth East panels and was approved July 28, 1994.

This proposal for mining in the Rilda Canyon Lease Extension would be done as an extension of current underground mining operations in the Blind Canyon seam and Hiawatha seam. The permit has been conditioned to reflect that mining under the south canyon escarpment will only be allowed after the appeals process for the Decision Notice/Finding of No Significant Impact (DN/FONSI) is resolved to the satisfaction of the Forest Service.

BACKGROUND

The original permit for the Deer Creek Mine was issued February 7, 1986 for approximately 14, 620 acres. The mining plan for Federal leases SL-064607-064621, SL-064900, SL-070645, U-1358, U-02292, U-084923, U-084924, U-083066, U-040151, U-044025, U-014275, U-024319, and U-47979 was approved on October 11, 1985 for the Deer Creek Mine. A Waste Rock Storage Facility was added September 1988. The permit was successively renewed on February 7, 1991. A reclamation surety bond in the amount of \$2,000,000 is currently posted for reclamation at the Deer Creek Mine.

The January 8, 1993 mining plan approval (IBC-1) added 120 acres of coal (80 acres in a portion of Lease No. U-47977 and 40 acres in a portion of Lease No. SL-050862). The July 22, 1993 mining plan approval (IBC-2) added 160 acres (80 acres in a portion of Lease U-47977 and 80 acres in a portion of Lease SL-050862).

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Administrative Overview
ACT/015/018
Rilda Lease Extension
October 27, 1994

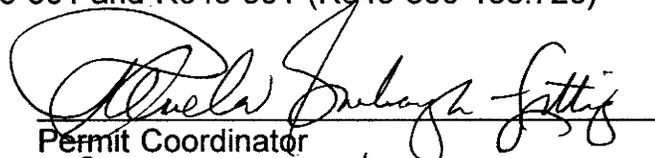
PacifiCorp submitted the original application for the Rilda Canyon Lease Extension which included Leases U-7653, U-47977, U-06039, and SL-050862 on February 12, 1990 and resubmitted an application on February 8, 1994. This submittal was revised on June 27, 1994 as an incidental boundary change (IBC-3) to include development mining only in U-06039, U-47977, and SL-050862 (approximately 100,000 tons). Included in the revised application was longwall mining the Second, Third and Fourth East panels and development mining in the Third North Mains and the Sixth East Gate. Longwall mining would proceed in areas that were previously approved as incidental boundary changes with mining plan approval dates of January 8, 1993 (IBC-1) and July 22, 1993 (IBC-2). Entry development mining in the Third North Mains and the Sixth East Gates entailed about 40 acres beyond the currently approved permit boundary in Leases U-06039, U-47977 and SL-050862. IBC-3 was approved July 28, 1994.

PacifiCorp has submitted an application to construct surface facilities in Rilda Canyon, which was included as part of the Environmental Assessment, and is currently under review by the Division and other state and federal agencies. The Environmental Assessment and Decision Notice/Finding of No Significant Impact (DN/FONSI) for the proposed surface facilities and mining under the south canyon escarpment is contingent upon the mitigations attached to the DN/FONSI and satisfactorily completing the appeals process.

RECOMMENDATION

The proposal to mine in the Rilda Canyon Lease Extension has been reviewed by the Division and other appropriate federal and state agencies. It is recommended that mining in the Rilda Canyon Lease Extension in federal leases U-7653, U-47977, SL-050862, parts of U-06039, and state lease ML-22509 be approved, with the condition that mining under the south canyon escarpment will only be allowed after the Forest Service is satisfied that the appeals process is resolved.

9. Underground mining 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.
10. The applicant has posted a surety bond for the Deer Creek Mine in the amount of \$2,000,000. No additional surety will be required at this time, because this action does not include any additional surface disturbance. (R645-300-134)
11. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. (R645-302-313.100 and R645-302-321.100)
12. The proposed postmining land-use of the permit area is the same as the pre-mining land use and has been approved by the Division and the surface land management agency, the United States Forest Service.
13. The Division has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.
14. All procedures for public participation required by the Act, and the approved Utah State Program are in compliance. See Affidavit of Publication, dated May 10, 1994. (R645-300-120)
15. No existing structures will be used in conjunction with mining of the underground right-of-way, other than those constructed in compliance with the performance standards of R645-301 and R645-301 (R645-300-133.720)



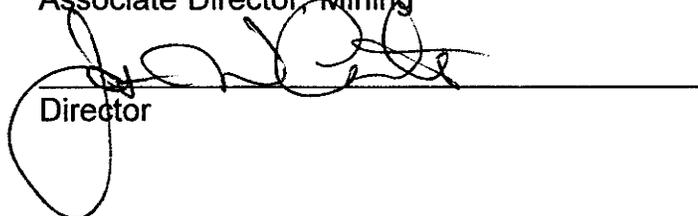
Permit Coordinator



Permit Supervisor



Associate Director, Mining



Director

FEDERAL

PERMIT
Permit Number ACT/015/018

OCTOBER 27, 1994

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/015/018, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (Division) to:

PacifiCorp
324 South State Street
P.O. Box 26128
Salt Lake City, Utah 84126-0128

for the Deer Creek Mine. A Surety Bond is filed with the Division in the amount of \$2,000,000, payable to the State of Utah, Division of Oil, Gas and Mining and the Office of Surface Mining Reclamation and Enforcement (OSM). The Division 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 within the permit area at the Deer Creek Mine, situated in the state of Utah, Emery County:

The area to be mined is contained on the USGS 7.5-minute "Red Point", "Rilda" and "Mahogany Point" quadrangle maps. The areas contained in the permit area, approximately 17,000 acres, involve all or part of the following federal, state, and fee coal leases:

Lease No. SL-064607-064621
Issued to Clara Howard Miller 10/4/46
Township 17 South, Range 7 East, SLM, Utah
Containing 613.92 acres

Section 2: Lots 2, 5, 6, 7, 10, 11 and 12 and SW1/4

Section 3: SE1/4 SE1/4

Section 10: NE1/4

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Lease No. SL-064900
Issued to Cyrus Wilberg 2/3/45
Township 17 South, Range 7 East, SLM, Utah
Containing 160 acres
Section 22: SE1/4 SW1/4, SW1/4 SE1/4, NE1/4 SW1/4, NW1/4 SE1/4

Lease No. U-1358
Issued to Castle Valley Mining Co. 8/1/67
Township 17 South, Range 7 East, SLM, Utah
Containing 320 acres
Section 22: S1/2 NW1/4, W1/2 SW1/4, E1/2 SE1/4
Section 27: E1/2 NE1/4

Lease No. SL-070645, U-02292
Issued to Clara Howard Miller 4/1/52
Township 17 South, Range 7 East, SLM, Utah
Containing 2560 acres
Section 4: SW1/4 SE1/4, S1/2 SW1/4
Section 5: SE1/4 SW1/4, S1/2 SE1/4
Section 8: E1/2, E1/2 W1/2
Section 9: All
Section 10: W1/2
Section 15: N1/2
Section 16: N1/2
Section 17: NE1/4, E1/2 NW1/4

Lease No. U-084923
Issued to Malcolm N. McKinnon 8/1/64
Township 17 South, Range 7 East, SLM, Utah
Containing 2252.42 acres
Section 4: Lots 2, 3, 4, 5, 6, 7, 10, 11, 12, NW1/4 SE1/4, N1/2 SW1/4
Section 5: Lots 1 thru 12, N1/2 S1/2, SW1/4 SW1/4
Section 6: Lots 1 thru 11, SE1/4
Section 7: Lots 1 thru 4, E1/2
Section 8: W1/2 W1/2
Section 17: W1/2 NW1/4
Section 18: Lots 1 and 2, N1/2

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Lease No. U-084924

Issued to Malcolm N. McKinnon 8/1/64

Township 17 South, Range 6 East, SLM, Utah

Containing 1211.48 acres

Section 1: Lots 1, 2, 3, S1/2 NE1/4, SE1/4 NW1/4, E1/2 SW1/4, SE1/4

Section 12: E1/2, E1/2 W1/2

Section 13: NE1/4, E1/2 NW1/4

Lease No. U-083066

Issued to Cooperative Security Corp. 3/1/62

Township 17 South, Range 6 East, SLM, Utah

Containing 2485 acres

Section 13: E1/2 SW1/4, SE1/4

Section 24: E1/2 W1/2, E1/2

Section 25: N1/2 NE1/4

Township 17 South, Range 7 East, SLM, Utah

Section 17: SW1/4, W1/2 SE1/4

Section 18: Lots 3 and 4, SE1/4

Section 19: Lots 1, 2, 3, 4, E1/2

Section 20: W1/2, W1/2 E1/2

Section 29: NW1/4 NE1/4, N1/2 NW1/4

Section 30: Lots 1, 2, 3, N1/2 NE1/4, SW1/4 NE1/4, NW1/4 SE1/4

Lease No. U-040151

Issued to Cooperative Security Corp. 3/1/62

Township 17 South, Range 7 East, SLM, Utah

Containing 1720 acres

Section 15: SW1/4

Section 16: S1/2

Section 17: E1/2 SE1/4

Section 20: E1/2 E1/2

Section 21: All

Section 22: N1/2 NW1/4

Section 27: N1/2 NW1/4

Section 28: N1/2 N1/2

Section 29: NE1/4 NE1/4

Lease No. U-044025

Issued to Cooperative Security Corp. 8/1/60

Township 17 South, Range 7 East, SLM, Utah

Containing 40 acres

Section 27: NW1/4 NE1/4

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Lease No. U-024319
Issued to Huntington Corp. 5/1/60
Township 16 South, Range 7 East, SLM, Utah
Containing 1040 acres
Section 27: SW1/4
Section 28: SE1/4
Section 33: E1/2, E1/2 NW1/4, NE1/4 SW1/4, S1/2 SW1/4
Section 34: NW1/4, NW1/4 SW1/4

Lease No. U-014275
Issued to John Helco 10/1/55
Township 16 South, Range 7 East, SLM, Utah
Containing 80 acres
Section 28: E1/2 SW1/4

Lease No. U-47979
Issued to Utah Power & Light Co. 10/1/81
Township 16 South, Range 7 East, SLM, Utah
Containing 1,063.38 acres, more or less
Section 34: S1/2 NE1/4, NE1/4 SW1/4, S1/2 SW1/4, SE1/4
Township 17 South, Range 7 East, SLM, Utah
Section 3: Lots 1 thru 8, 10 thru 12, SW1/4, SW1/4 SE1/4
Section 4: Lots 1, 8, 9, E1/2 SE1/4

Lease No. U-47977
Township 16 South, Range 7 East, SLBM
Containing 640 acres
Section 32: All

Lease No. SL-050862 (consolidated to include U-24069 and U-24070)
Township 16 South, Range 7 East, SLBM
Containing 280 acres
Section 28: W1/2 SW1/4
Section 29: E1/2 SE1/4
Section 33: W1/2 NW1/4, NW1/4 SW1/4

Lease No. U-06039
Township 16 South, Range 7 East, SLBM
Containing 400 acres
Section 29: SW1/4, W1/2 SE1/4
Section 30: SE1/4

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Lease No. U-7653
Township 16 South, Range 7 East, SLBM
Containing 411.6 acres
Section 31: All

OWNERS OF COAL TO BE MINED OTHER THAN THE UNITED STATES

State Lease ML-22509
Township 16 South, Range 6 East, SLBM
Containing 640 acres
Section 36: All

The Estate of Malcolm McKinnon
Zions First National Bank, Trustee, Salt Lake City, Utah 84111
Township 17 South, Range 7 East, SLM, Utah
Section 10: SE1/4
Section 11: W1/2 W1/2, NE1/4 NW1/4
Section 14: W1/2 NW1/4

Cooperative Security Corp.
115 East South Temple, Salt Lake City, Utah 84111
Township 17 South, Range 7 East, SLM, Utah
Section 15: SE1/4
Section 22: NE1/4

Also:
Beginning at the SE corner of NE1/4 SE1/4 Section 25, T17S, R6E, SLM,
thence North 160 rods, West 116 rods to center line of Cottonwood Creek;
thence southerly along center line of said creek to a point 84 rods West of
the beginning; thence East 84 rods to the beginning.

The above listed surface rights and coal owned or leased by PacifiCorp,
successor in interest to Utah Power & Light Company.

PacifiCorp
324 South State, PO Box 26128, Salt Lake City, Utah 84126-0128
Township 17 South, Range 7 East, SLM, Utah
Section 14: SW1/4 (West of the Deer Creek Fault)

ADDITIONAL LANDS TO BE AFFECTED BY MINING

Township 17 South, Range 7 East, SLM, Utah

State of Utah Special Use Lease Agreement No. 284 utilized for conveyor and power line right-of-ways located in the southeast quarter of Section 2

Township 17 South, Range 8 East, SLM, Utah
PacifiCorp fee land (successor to Utah Power & Light Company) utilized for a Waste Rock Disposal Site located within Lots 4 and 5 of Section 5 and Lot 1 and the Southeast quarter of the Northeast quarter of Section 6

This legal description is for the permit area of the Deer Creek 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 COMPLIANCE - The permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program.

Sec. 4 PERMIT TERM - This permit expires on February 15, 1996.

Sec. 5 ASSIGNMENT OF PERMIT RIGHTS - The permit rights may not be transferred, assigned or sold without the approval of the Director, Division. 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 R645-303-300.

Sec. 6 RIGHT OF ENTRY - The permittee shall allow the authorized representative of the Division, including but not limited to inspectors, and representatives of the Office of Surface Mining Reclamation and Enforcement (OSM), 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, R645-400-220, 30 CFR 842.13 and R645-400-110;

(b) be accompanied by private persons for the purpose of conducting an inspection in accordance with R645-400-100 and R645-400-200 when the inspection is in response to an alleged violation reported to the Division by the private person.

Sec. 7 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 approved plan and approved for the term of the permit and which are subject to the performance bond.

Sec. 8 ENVIRONMENTAL IMPACTS - The permittee shall take all possible steps to minimize any adverse impact to the environment or public health and safety resulting from noncompliance with any term or condition of the permit, including, but not limited to:

- (a) Any accelerated or additional monitoring necessary 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. 9 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. 10 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 the Division in approving alternative methods of compliance with the performance standards of the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 11 EXISTING STRUCTURES - As applicable, the permittee will comply with R645-301 and R645-302 for compliance, modification, or abandonment of existing structures.

Sec. 12 RECLAMATION FEE PAYMENTS - The operator shall pay all reclamation fees required by 30 CFR Part 870 for coal produced under the permit, for sale, transfer or use.

- Sec. 13 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. 14 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. 15 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. 16 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 the Division. The Division, after coordination with OSM, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by Division within the time frame specified by Division.
- Sec. 17 APPEALS** - The permittee shall have the right to appeal as provided for under R645-300-200.
- Sec. 18 SPECIAL CONDITIONS** - There are special conditions associated with this permitting action as described in attachment A.

The above conditions (Secs. 1-18) are also imposed upon the permittee's agents and employees. The failure or refusal of any of these persons to comply with these conditions shall be deemed a failure of the permittee to comply with the terms of this permit and the lease. The permittee shall require his agents, contractors and subcontractors involved in activities concerning this permit to include these conditions in the contracts between and among them. These conditions may be revised or amended, in writing, by the mutual consent of the Division and the permittee at any time to adjust to changed conditions or to correct an oversight. The Division may amend these conditions at any time without the consent of the permittee in order to make them consistent with any federal or state statutes and any regulations.

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THE STATE OF UTAH

By: 
Date: November 2, 1994

I certify that I have read, understand and accept the requirements of this permit and any special conditions attached.

Authorized Representative of
the Permittee

Date: _____

Attachment A

SPECIAL CONDITIONS

1. If during entry development, sustained quantities of groundwater are encountered which are greater than 5 gpm from a single source in an individual entry, and which continue after operational activities progress beyond the area of groundwater production, PacifiCorp must monitor these flows for quality and quantity under the approved baseline parameters.

PacifiCorp will notify the Division within 24 hours prior to initiation of said monitoring.

2. This permit becomes effective for mining in the Rilda Canyon Lease Extension when the mining plan is approved by the Secretary of the Interior, except for mining under the south canyon escarpment which will be allowed when the Forest Service is satisfied that the appeals process is finalized and that any appeal has been satisfactorily resolved.
3. PacifiCorp must notify the Division within 14 days of the decision on the appeal of outstanding federal violation 93-020-190-05, 1 of 1.
4. PacifiCorp must notify the Division within 14 days of the decision on the appeal of outstanding cessation order 94-020-370-002, 1 of 1.

U-47977

ENVIRONMENTAL ASSESSMENT

40 CFR 1500
43 CFR 3521, 1-4

Proposed Coal Lease Tract

Section 32, T. 16 S., R. 7 E. SLM
Emery County, Utah

Responsible Agency: USDA, Forest Service
Manti-LaSal National Forest
350 East Main Street
Price, Utah 84501

Responsible Official: Reed C. Christensen
Forest Supervisor

For Further Information Contact: Ina W. Hatch
District Forest Ranger
Price Ranger District
10 North Carbon Avenue #2
Price, Utah 84501

Prepared By *John H. Oldfield* Date 15 Septel 1980
Geologist

Approval Recommended By *Walter E. March* Date 9/15/80
District Geologist

Ina W. Hatch Date 9/17/80
District Ranger

W. R. Bailey Date 10/7/80
Forest Engineer

Approved By *Reed C. Christensen* Date 10/8/80
Forest Supervisor

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I. PURPOSE AND NEED FOR ACTION

- A. Under the new coal leasing program, the Department of the Interior has combined all major Federal coal management responsibilities into one unified program in order to:
1. Give the Nation a greater assurance of being able to meet its national energy objectives.
 2. Provide a means to promote a desirable pattern of coal development with adequate environmental protection.
 3. Assure that State governments and local communities participate in decisions about where and when Federal coal production will take place.
 4. Increase competition in the western coal industry.
- B. The Secretary of Interior's new coal program has resulted in a leasing target of 322 million tons for the Uinta-Southwestern Utah Coal Region. To help meet this goal, a proposal to lease the Section 32 Tract will be analyzed by this environmental assessment and the Uinta-Southwestern Coal Region Environmental Statement. This document assesses the impacts of leasing with subsequent development of the delineated tract.

II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. Proposed Action

The proposed action is to lease the Section 32 Tract which is part of a Logical Mining Unit (LMU - as defined in 43 CFR 3400.0-5 (cc)). The reserves would be mined within a forty year period, at the yearly production rate used to develop the LMU under a "generic" or "typical" mining and reclamation plan for the type of mine that is representative of the local area. Plans are discussed in sub section C of this section.

I. Description of the Tract.

A. Tract Locators and Descriptors

The tract has been delineated by the Tract Delineation Team. It is bounded on the east, west and partially on the north by leases owned by the Estate of Malcom W. McKinnon with options to Northwest Carbon Corporation (hereinafter called Northwest). Additionally, the tract is bounded on the north, south and partially on the east by leases owned or controlled by Utah Power and Light Company (hereinafter called UP&L). (See Map 2)

The lease is described as follows:

Section 32, T. 16 S., R. 7 E., S1M; Emery County, Utah,
640.0 acres.

The surface and mineral rights are federally owned.

B. Description of the Coal

The entire tract is underlain by at least two minable beds of coal. According to the ERPA report, only the Blind Canyon and Hiawatha beds were considered in establishing the coal reserves, estimated at 18,700,000 tons. Another bed, the Bear Canyon bed outcrops in Section 27 and 28, but its economic potential has not been evaluated. Of these reserves, about 40% is considered to be recoverable using room and pillar mining, and up to 70% with longwall mining. The amount actually recovered will vary with the mining methods used, underground conditions and amount of coal that is to be left to protect the escarpments and boundaries between other company leases.

The coal is ranked as a high volatile A-B bituminous coal having average characteristics as shown in Table 1.

Table 1

Average characteristics of coal in the Section 32 tract (as received from both seams from Doelling)

Moisture	5.0%
Volatile Matter	42.2%
Fixed Carbon	45.5%
Ash	7.3%
Sulfur	0.5%
Energy Content	13,900 BTU/LB

Coal of this grade is suitable for steam or metallurgical purposes.

C. Mining Considerations

(1) Conceptual Mine Plan for Northwest

Map No. 2 shows Northwest's leases in relation to Section 32. According to the U.S. Geological Survey's Receiving Potential Analysis and Northwest's Conceptual Mine Plan, both for Section 32, the access and portal site would be at the old Helco Mine in Rilda Canyon. The existing entries would be improved and new entries would be driven westward to their State lease in Section 2, T. 6 S., R. 7 E., SLM. Northwest would then back-mine to the east, utilizing both conventional and long wall mining methods.

Northwest would sell the coal on contract for domestic or export use.

Northwest would plan to mine their leases with Section 32 in twenty years, at a rate of 1 to 1.5 million tons per year. This rate of production would require about thirty acres, for portal facilities, load-out facilities for shipping and settling ponds. The coal would either be transported from the mine by truck or conveyed down the canyon to a load-out facility and trucked from there. Based on production of 1.5 million tons per year and operating 300 days per year; 125 40-ton trucks per day would be required. A slurry pipeline or conveyor are possibilities as alternatives to hauling.

Power and telephone lines would be brought up Rilda Canyon from trunk lines in Huntington Canyon. Water for mining and other purposes would have to be obtained on-site by drilling wells or buying water rights from the North Emery Water Users Association.

If Section 32 is leased and Northwest is successful in obtaining the lease, they could be expected to submit a mine plan shortly after obtaining the lease. This information is based on discussions with Mr. Robert Johnson, Senior Mining Engineer for Northwest.

(2) Conceptual Mine Plan for Utah Power and Light Company

Map No. 2 shows UP&L's leases in relationship to Section 32. The configuration of these leases, plus UP&L's existing workings to the west and south, allow UP&L several options for mining Section 32. These options are:

- (a) Mine Section 32 through their existing Deer Creek Mine.
- (b) Open a mine in the North Fork of Meetinghouse Canyon and transport the coal to their power plant by conveyor.
- (c) Open a mine in Rilda Canyon and truck the coal to their power plant. The location of a mine in Rilda Canyon would depend on whether or not UP&L also obtained Northwest's leases. If these leases were obtained, UP&L would probably use the old Helco Mine for entry.

Option (a) is viable but unlikely for the following reasons. Although the lease is only $2\frac{1}{2}$ miles from the Deer Creek portal, UP&L holds leases that are north of Section 32, making a new portal more accessible to these holdings. Second, their conveyor at the Deer Creek Mine is at capacity. Unless a larger conveyor or second conveyor were to be built, UP&L would have to alter their mine plan because of diligence requirements for the Section 32 tract. All of the coal mined would be used for generating electricity at their Huntington or Hunter power plant complexes.

Options (b) and (c) are the most viable if UP&L obtains the tract. Option (b) would allow UP&L to transport their coal by conveyor down Meetinghouse Canyon to their power plant. Option (c) has the advantage of a more central location to their holdings. Both options would require about thirty acres of surface facilities. Option (b) would require about five miles of phone and power lines; option (c) about two and one-half miles of phone and power lines.

If UP&L obtains the lease to Section 32, they will probably not submit a mine plan as quickly as Northwest would because of their existing ongoing operations. A mine plan involving Section 32 would eventually have to be submitted because the lease would be competitive and contain a diligent development clause. This information is based solely on an analysis of UP&L's present mining situation and plans for power plant expansion.

D. Other Considerations

The surface and all minerals of the Section 32 tract are federally owned. The tract is within the boundary of the Manti-LaSal National Forest. The coal mined from this tract could be used to generate steam for electricity, heat or mechanical purposes in Utah, other states, and Japan.

Reclamation potential of the mine sites will depend largely on location. Locating the portal on an existing disturbed site enhances reclamation potential because these sites were not reclaimed in the past, and the entries were left open. Post mining use of the lands will revert to premining uses, ie recreation and wildlife habitat.

E. Maps

Map 1 shows the location of the tract in relation to the cities of Huntington and Price as well as its location on Manti-LaSal National Forest. Map 2 shows the tract in relation to surrounding leases and mines.

F. Documentation

Assumptions, guidelines and decisions used in the tract delineation and ERPA preparation are found in the Final Environmental Statement For Central Utah, prepared in 1979 and the Final Environmental Statement For The Ferron-Price Land Management Plan prepared in 1979.

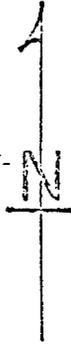
2. Relationship to Land Use Planning

The tract is located in the Huntington Canyon Management Unit (A-3) of the Coal Lands Management Area as described in Ferron-Price Land Management Plan. This plan underwent extensive public review including public meetings when prepared as a draft Environmental Statement. Among the Management Directions of the plan is: (to) "provide for coal leasing and development, where appropriate, in a logical, sequential manner to minimize impacts."

US 6 & 50



Price



Manti-LaSal
National Forest

PROPOSED LEASE TRACT
SECTION 32, T.16 S., R.7 E. SLM

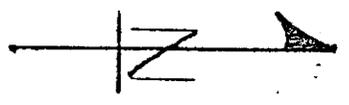
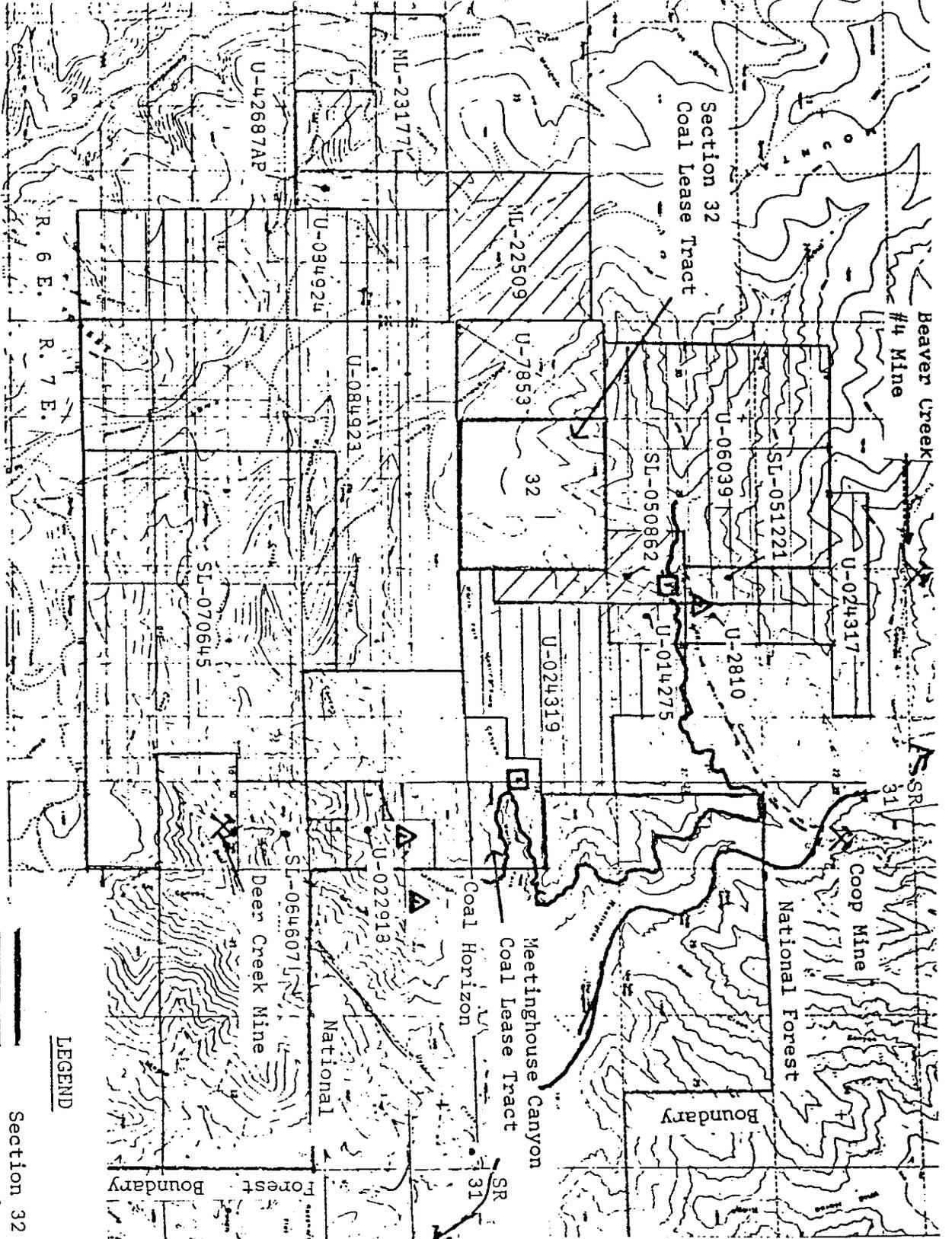


SR 10

SR 31

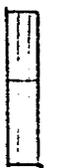
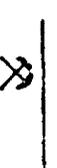
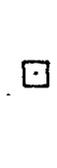


Huntington



To
 SR T. 16 S.
 31 T. 17 S.
 Huntington

LEGEND

-  Section 32 Tract
-  Leases Owned or Controlled by Northwest Carbon
-  Leases Owned or Controlled by UFG&L
-  National Forest Boundary
-  Portal Sites of Existing Mines
-  Portal Sites of Former Mines
-  Potential Site for Mining Coal from Section 32
-  Coal Horizon

The only Unsuitability Criteria that apply are: Criteria #2 (Rights-of-way and Easements), #9 (Federally Listed Endangered Species), #11 (Bald and Golden Eagle Nests), #14 (Migratory Birds), #16 (Flood Plains), and #17 (Municipal Watersheds). The remaining 12 criteria do not apply. After the exceptions were applied to the six remaining criteria, only criteria #17 applied. Proper procedures will have to be adhered concerning the municipal watershed. The situation requires an evaluation in regard to the North Emery Water Users Association municipal water collection and transmission system in Rilda Canyon.

3. Relationship of the Tract to Other Uses

The Section 32 tract is within three miles of UP&L's Deer Creek Mine, the Co-op Mine and ARCO's Beaver Creek #4 Mine (see Map 2). These mines are currently in production. Additionally, the tract is within one mile of the former Romminger Mine and a conceptual mine site in the North Fork of Meetinghouse Canyon for the Meetinghouse Tract (see Map 2). The Romminger Mine is owned by the Eagle Mining Company which is exploring options of reopening the mine.

The tract is located about ten miles north west of Huntington, the city where most of the construction workers and miners would probably reside. A culinary water collection and transmission system is located in Rilda Canyon, north of the tract.

4. Authorizing Actions

Leasing and development will be under the authority of the following laws: The Mineral Leasing Act of February 25, 1920, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; the Surface Mining Control and Reclamation Act (SMCRA) of 1977; the Multiple Minerals Development Act of August 18, 1954; the Department of Energy Organization Act of August 4, 1977; the National Environmental Policy Act (NEPA) of 1969; the Federal Coal Leasing Amendments Act of 1976, as amended; the Act of October 30, 1978 that further amended the Mineral Leasing Act of 1920, and regulations: Title 43 CFR Part 3041, Part 3500, Part 2800 and Title 30 Part 211, Part 700.

5. Mitigation Measures Included as Part of the Proposed Action and Alternatives

If leased, the successful lessee will have to comply with all Federal, State and local regulations, laws and policies, as they affect the leasing and development of coal. For a complete and detailed listing of laws affecting coal leasing and development, please refer to the Final ES on the Federal Coal Management Program (pp. 1-15 through 1-23).

6. Further Environmental Assessment Points

The successful lessee or lessees must also submit a plan, within three years after leasing, for mining and reclamation to the Secretary of the Interior, Office of Surface Mining, for approval. The mining plan will be reviewed and an environmental assessment or environmental statement will be prepared prior to the approval of the mine plan. Additional site specific environmental assessments may be required before the development of coal on this tract.

B. Alternatives

The only alternative to the "Proposed Action" is the "No Action" alternative. Recommending no lease is the "No Action" alternative as defined by CEQ guidelines.

II. AFFECTED ENVIRONMENT AND ANTICIPATED TRENDS

A. Climate

Annual precipitation ranges between 23 inches and 27 inches, of which nearly 65 percent is snowfall from October to March. (Figure 1) Snow is redistributed by wind action and redeposited behind trees, on the north and east side of ridges, and other areas where the wind velocity is decreased by an obstruction. The mean annual temperature of sites having similar elevations as this tract, range from 36 degrees Fahrenheit to 40 degrees Fahrenheit. The frost-free period ranges from forty days on the ridge tops to one hundred days in the valley bottoms. (Figure 2)

B. Air Quality

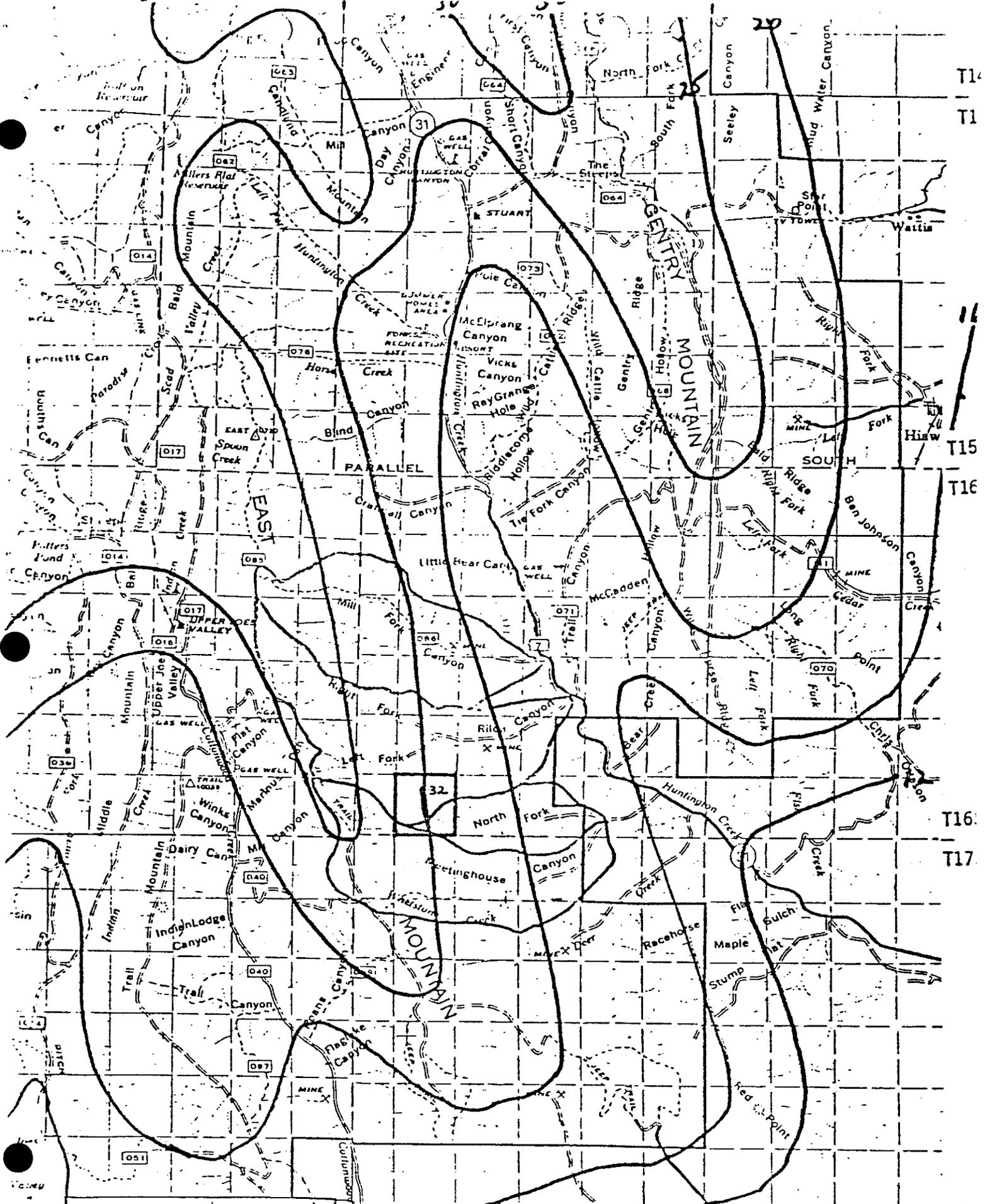
The state of Utah has been monitoring total suspended particulates (TSP), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) at Castle Dale and Huntington, Utah. Ozone (O_3) has been monitored at Salt Wash for the Intermountain Power Project. However, the levels of carbon monoxide (CO), and Lead (Pb) have not been monitored but need to be. The total suspended particulate concentrations approach the National Ambient Air Quality Standards. It is expected that a major portion of the particulates was associated with windblown soil. Concentrations of sulfur dioxide were well within the National Air Ambient Quality Standards. High concentrations of ozone (O_3) have been measured at rural locations, but this was thought to be from natural sources. No carbon monoxide or lead concentrations are available for the region, but levels are expected to be low. Air quality is expected to remain well within standards, although no measurements have been made at the tract.

C. Topography and Geology

1. Geologic Setting

The tract is located on the eastern edge of the Wasatch Plateau, subsection of the High Plateau Section of the Colorado Plateau Physiographic Province. The Wasatch Plateau is a north-south trending feature formed by uplifted sedimentary rock of late Cretaceous - early Tertiary age (Figure 3). The coal of interest is found in several seams near the base of the Blackhawk formation.

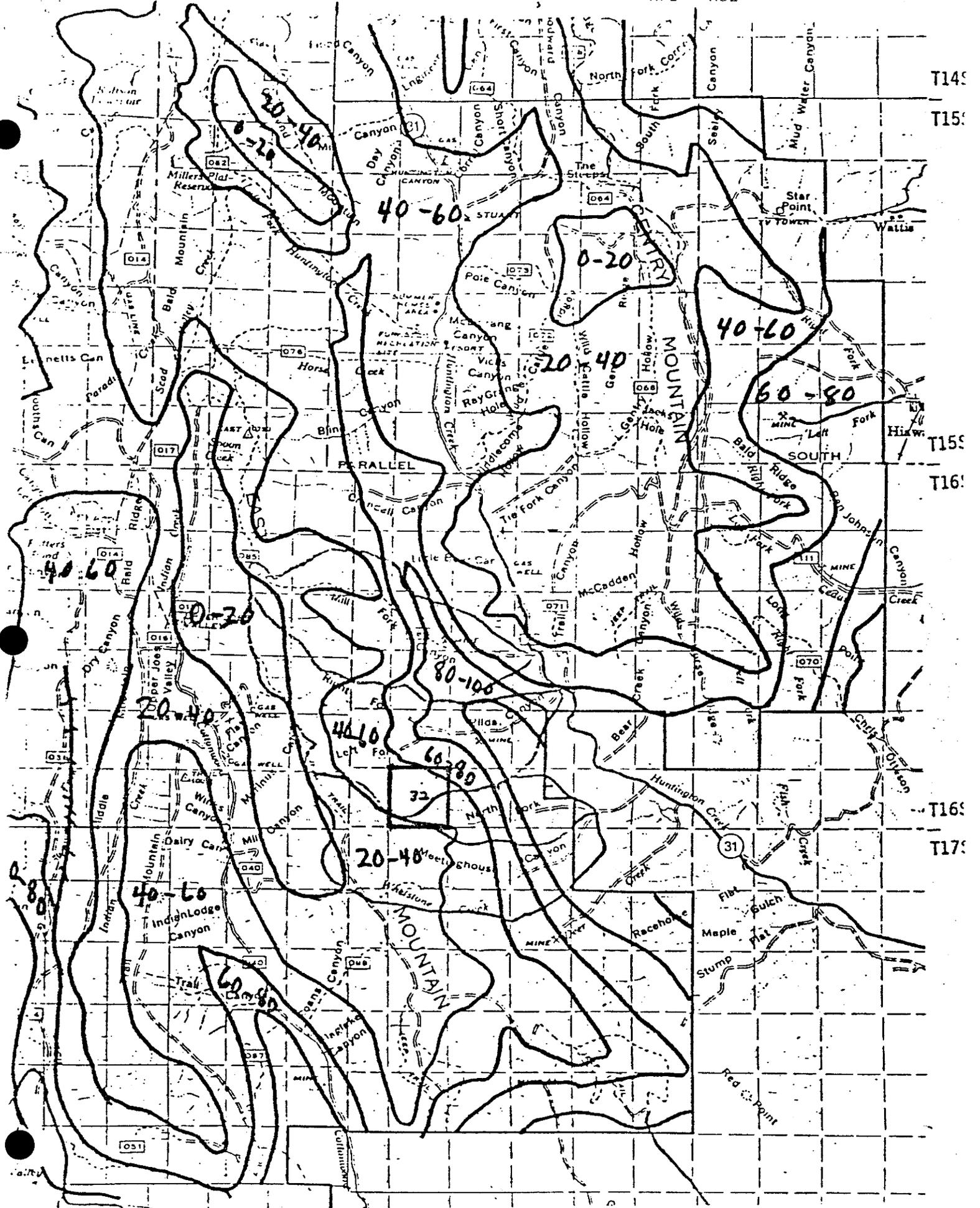
The eastern side of the plateau is characterized by steep slopes and escarpments incised and dissected by perennial and intermittent streams. Slopes vary, but are typically over 55 percent except in the narrow canyon bottoms where the gradients are normally less than 20 percent. These steep, rocky slopes with numerous rock outcrops indicate shallow soil development.



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Mean Annual Precipitation (inches)
Source: Utah Hydrologic Atlas

FIGURE 1



Mean Annual Freeze-Free Season (days)
 Source: Utah Hydrologic Atlas

FIGURE 2

After Doelling

System	Series	Stratigraphic Unit	Thickness (feet)	Description	
TERTIARY	Eocene	Green River Formation	-	Chiefly greenish lacustrine shale and siltstone.	
		Wasatch Group	Colton Formation	300-1,500	Variocolored shale with sandstone and limestone lenses, thickest to the north.
	Paleocene		Flagstaff Limestone	200-1,500	Dark yellow-gray to cream limestone, evenly bedded with minor amounts of sandstone, shale and volcanic ash, ledge former.
			North Horn Formation (Lower Wasatch)	500-2,500	Variogated shales with subordinate sandstone, conglomerate and freshwater limestone, thickens to north, slope former.
CRETACEOUS	?				
	Maastrichtian	Mesaverde Group	Price River Formation	600-1,000	Gray to white gritty sandstone interbedded with subordinate shale and conglomerate, ledge and slope former.
			Castlegate Sandstone	150- 500	White to gray, coarse-grained often conglomeratic sandstone, cliff former, weathers to shades of brown.
			Blackhawk Formation MAJOR COAL SEAMS	700-1,000	Yellow to gray, fine- to medium-grained sandstone, interbedded with subordinate gray and carbonaceous shale, several thick coal seams.
			Star Point Sandstone	90-1,000	Yellow-gray massive cliff-forming sandstone, often in several tongues separated by Masuk Shale, thickens westward.
	Campanian	Mancos Shale	Masuk Shale	300-1,300	Yellow to blue-gray sandy shale, slope former, thick in north and central plateau area, thins southward.
			Emery Sandstone COAL (?)	50- 800	Yellow-gray friable sandstone tongue or tongues, cliff former, may contain coal (?) in south part of plateau if mapping is correct, thickens to west and south. Coal may be present in subsurface to west.
	Santonian	Mancos Shale	Blue Gate Member	1,500-2,400	Pale blue-gray, nodular and irregularly bedded marine mudstone and siltstone with several arenaceous beds, weathers into low rolling hills and badlands, thickens northerly.
			Ferron Sandstone Member MAJOR COAL SEAMS	50- 950	Alternating yellow-gray sandstone, sandy shale and gray shale with important coal beds of Emery coal field, resistant cliff former, thickens to the south.
	Coniacian	Mancos Shale	Tununk Shale Member	400- 650	Blue-gray to black sandy marine slope forming mudstone.
			Dakota Sandstone	0- 60	Variable assemblages of yellow-gray sandstone, conglomerate shale and coal. Beds lenticular and discontinuous.
	Turonian				
		Cenomanian			
Albian					
		MINOR COAL			

Generalized section of rock formations, Wasatch Plateau coal field.

Figure 3

The tract ranges in elevation from 8100 to 9825 feet. If adjacent leases are included, a logical mining unit including this tract would range in elevation from 7000 to over 10,000 feet.

2. Geologic Structure

The eastern half of the Wasatch Plateau consists of rock structures that lie nearly horizontal or have regional dips up to five degrees to the east and south. North-South trending faults dissect the plateau with displacements ranging from a few feet to several hundred feet. There have been no faults mapped on Section 32. The nearest faults cross the southeast part of Section 33 and southwest part of Section 34. These are down thrown to the southeast and are part of the Pleasant Valley fault zone. It is likely that the rock strata are jointed, however, the extent is unknown.

The tract is within seismic zone 2 according to the Uniform Building Code for Utah. This means that the potential for major seismic activity is moderate to high and that there is better than a 50 percent chance of a major seismic event in 100 years.

3. Paleontology

All formations exposed on the tract contain fossils; however, significant fossils are likely to be found only in the Blackhawk and North Horn Formations. Significant vertebrate fossils include: Crocodile, turtle, fish and dinosaur bones of various species (Robison, 1977). Some minor plant fossils have also been found in the Blackhawk Formation.

D. Minerals

1. Coal

The proposed action and the Tract Delineation report adequately describes the quality and tonnages of coal in the Section 32 Tract. Existing and proposed coal mines have also been discussed earlier in this report.

The tract has not been drilled for coal, although Northwest has obtained a Coal Exploration License from the BLM to explore the tract. An operating plan has been submitted by Northwest to drill one hole on the tract along with holes in contiguous state and federal leases. Holes have been drilled by UP&L in adjacent and nearby leases.

2. Other Minerals

The tract is leased for oil and gas under Federal Lease U-15210. There has been no drilling or other exploration and seismic work even though the tract is within three miles of the Flat Canyon KGS. Wells drilled within the KGS have been dry or capped for recharge and future use.

E. Soils

Soils consist of sandy, silty clay to clay and vary in depth from zero to several feet. Soils are unstable and saturated as evidenced by micro-contouring, small slumps and geotropism of vegetation. Areas showing the greatest instability are in Sections 32 and 33. These shale outcrops, in the North Horn Formation, weather to a fine clay that is very unstable when wet.

The soils can be grouped on the basis of those found on north-facing slopes and those found on south-facing slopes. The south-facing slopes are generally 20 degrees warmer. About half are composed of rock outcrop and shallow soil (less than 20 inches deep). The remaining area (50 percent) have moderately deeper soils (20 to 40 inches). The soil is light colored, which is indicative of little organic matter present. The soil on the north-facing slopes have formed on sandstone and shale colluvium, and are usually deeper than 40 inches. Textures range from cobbly loam to clay loam.

Erosion has been very extensive in the past and is occurring at an appreciable rate today. The reclamation potential where soils are shallow is low.

F. Hydrology

Section 32 is located across the divide separating Meetinghouse Canyon, North Fork of Meetinghouse Canyon and Rilda Canyon. All are within the Huntington Creek Watershed. Huntington Creek is tributary through the San Rafael to the Green and Colorado Rivers, and the drainage pattern is classified as dendritic. Meetinghouse, North Meetinghouse and Rilda Creeks are formed from springs and seeps as well as run off from snow melt and thunderstorms. Water usage of each of the creeks is described as follows:

1. Meetinghouse Creek

This creek is a perennial creek originating in adjacent Section 31. It is used primarily for agricultural and wildlife uses. A stock pond that contains all of the summer flow is located about one mile down stream from the source in Section 3, T. 17 S., R. 3 E., SLM. Any overflow along with runoff caught below the pond flows into Huntington Creek for agricultural, wildlife and recreational uses.

Meetinghouse Creek does not flow through Section 32, but a major portion of its watershed is on Section 32.

2. North Fork of Meetinghouse Creek

North Fork of Meetinghouse Creek originated near the tract in Section 33. This is an ephemeral stream depending on snowmelt and storms for its water. The water is channeled to Huntington Creek, where it is used for agriculture, wildlife and recreation. A large portion of the originating watershed for North Fork of Meetinghouse Creek is on the Section 32 Tract.

3. Rilda Creek

Rilda Creek is a perennial creek fed by springs, snowmelt and storms. It forms near the old Helco Mine from the left and right forks. Neither fork nor the creek itself is on the tract, but the tract is part of the watershed. Four springs, two in each fork are used by the North Emery Water Users Association for culinary water. The exact source of these springs is not known; however, preliminary investigations show that three of springs are surface springs from colluviun and one originates from the Starpoint Sandstone. In addition to supplying culinary water, Rilda Creek supports riparian vegetation. Water from Rilda Creek flows into Huntington Creek, where it is used for agriculture, wildlife and recreation uses.

There are two known aquifers on the tract. They are, from lower to upper, the Starpoint Sandstone and the Castlegate Sandstone. These aquifers are separated by the nearly 1000 foot thick Blackhawk formation. Little is known of the structure of these aquifers and their influence on the springs in Rilda Canyon. Northwest Carbon is undertaking a study of the surface and subsurface hydrologic regimen. This study should be finished in 1981.

G. Vegetation

Rilda Canyon is a rugged mountainous tributary to Huntington Canyon. Life zones and vegetative communities vary with elevation, exposure, slope and aspect. These conditions combine to form a complex vegetation mosiac. Predominant vegetation is Englemann spruce and alpine fir. The spruce/fir association is invading aspen communities throughout the area. Windblown ridge tops and dry hillsides are obvious in the tract. A bunchgrass association of native wildryes and wheatgrasses occupies these slopes. Mountain brush communities occur on the driest rocky areas and sagebrush occurs on dry sites with deeper soils. Small canyon bottoms are lined with bluegrass and carex species. Some cottonwoods can be found in the lower reaches of these small canyons. No endangered, threatened or sensitive plant species are known to occur on Section 32.

H. Range

The acreage within this tract is within two cattle allotments, Gentry Mountain and East Mountain. Cattle use in the area is restricted by topography. The area is classified as nonrange due to the rugged terrain, steep slopes and water availability for cattle.

I. Wildlife

Section 32 is located within Utah Division of Wildlife Resources Deer Herd Unit #34 and Elk Herd Unit #12. Mule deer and Rocky Mountain elk use the tract primarily in the spring, summer and fall. Big game animals move into the canyons and south-facing slopes during normal winters.

Several species of mammals occupy the area. Also, many migratory and transient avian species occur there. Along with several passerine species, this area is home to numerous raptors including goshawks and sharp-shinned hawks. A raptor survey has been completed for this area. Section 32 does not contain habitat critical for bald eagle or any other known endangered wildlife species.

The leasing of this tract poses no threat to any wildlife species in the area. However, surface disturbance in the area will have impacts on all wildlife species present. Elk and deer occupying the tract use this area for calving and fawning activities. Any disturbance in the tract could significantly alter local big game populations.

This area has not been intensively surveyed for threatened or endangered flora or fauna. None are known to exist here.

J. Cultural and Historic Resources

There is evidence of Fremont and Ute Cultures in the area, but no sites have been found within two miles of the tract. The old Helco portal has been cleared under BLM contract for the Coal Task Force.

K. Visual

All of the A-5 Unit (Ferron-Price Land Management Plan) is at the Retention-Visual Quality Level. Section 32 and Rilda, Meetinghouse and Deer Creek Canyons outside the A-5 unit are Modification or Partial Retention visual quality levels. Each of these canyons have been disturbed with mining or drilling activity.

L. Recreation

There are no recreation sites in Deer Creek, Meetinghouse and Rilda Canyons as well as on the Section 32 Tract. The canyons are used for fishing, big game hunting and gathering forest products. Section 32 and the adjacent areas on the ridge may be occupied by campers and hunters for short duration. Vehicle access to the tract is through private land, which may restrict potential users.

State Route 31 is a major recreation corridor to campgrounds, roads and other areas of the National Forest. There are three BLM and one Emery County recreation sites on State Route 31 between Meetinghouse and Rilda Canyons.

M. Land Use

Grazing, hunting and coal drilling are the only known uses of the surface of Section 32. Meetinghouse Canyon is virtually unused because entrance to the canyon is blocked by a gate controlled by UP&L. Rilda Canyon has several uses. Its primary use is the culinary water collection and transmission system for the North Emery Water Users Association. Other present uses involve recreation. The canyon formerly was used for coal mining and hauling.

N. Transportation and Noise

The existing road in Rilda Canyon is a single lane road with native surfacing. The roadway follows the stream with an average grade of six percent. The road ends at about the 1/4 corner between Sections 28 and 29. The road was constructed to serve the existing portals near its end. The road has been used for access to the water collection system for North Emery Water Users Association. A water transmission line has been constructed above the road on the north side to carry the water from the collection system. The road could be extended up the canyon approximately 2,000 feet and then further extended 4,000 feet into the left fork, or 6,000 feet into the right fork. Four-wheel drive trails exist along portions of these routes. The extension of the road would, however, bring the road to an elevation above the coal outcrops. Any further extension of the road beyond these limits would require road construction on 50 percent plus side slopes with full bench sections.

The road in Rilda Canyon has the potential for transporting coal from Section 32, plus other leases in the canyon. The road could be upgraded horizontally, vertically, and widened without severe impacts to the terrain.

A twenty-four foot long single lane I-stringer bridge crosses Huntington Creek near the juncture with SR-31. The decking has recently been repaired and the bridge is adequate for carrying most traffic. The juncture of the road to SR-31 is at an eight percent grade and requires a 300 degree turn to enter the road towards Huntington.

State Route 31 is a 45 mile paved highway connecting the cities of Huntington and Fairview, Utah. The road is designed to carry volumes of 680 average daily traffic (ADT) and 100 daily hour volume (DHV). Current usage is already near the designed capacity.

A transportation study for State Route 31 is in progress and should be completed in 1981.

O. Socio-Economic

The USGS's Economic Recovery Potential Analysis states that the construction and mining of Section 32 over forty years would require 50 to 55 people. Inasmuch as the lease would probably be mined in less time and in conjunction with other leases, a larger work force will be required.

Construction workers and miners can be expected to be drawn from the local work force and recruited from areas of high unemployment. Workers can be expected to live within a 50 mile radius of the mine with most, probably, taking up residence in Huntington.

New workers moving into an area can be expected to be married with a family.

P. Trends in the Affected Environment

The leasing of the tract will result in the submission of a mine plan within three years of leasing. Considering that one to two years may be required for the approval of the mine plan and one to five years for site preparation, a five to ten year span could spread between leasing and mining.

Within that time span, demands for recreation and water will increase due to an expanding population drawn to the high paying jobs of the energy industries. An increased population will mean greater usage of State Route 31, campgrounds and forest roads. These increased uses will cause an increase in noise and possible degradation in air quality.

Mining and hauling in narrow canyons such as Rilda and Meetinghouse has the potential to severely impact existing uses. In the past, there have been requests by mining companies to close these canyons to all uses not related to mining.

IV. ENVIRONMENTAL CONSEQUENCES

A. Impact Analysis of Alternatives Including the Proposed Action

1. The "No Action" Alternative

Coal development would not take place and ancillary facilities would not be constructed. Use of the surface and other resources such as wildlife, grazing and recreation would continue in the present manner. There would be no degradation of air, water or visual quality. This "No Action" alternative would be most favorable for oil and gas exploration and development. There effectively would be no traffic increase on State Route 31.

2. The "Proposed Action"

There are two groups of impacts associated with the "Proposed Action." The first group are these impacts associated with the tract. The second group are those impacts associated with a portal site to mine the coal.

Impacts associated with the tract may include subsidence, soil instability and movement and disruption of the surface and subsurface hydrologic regime. Whether or not these impacts occur and their extent will depend on such factors as condition of the overburden, the location and site of the voids left by mining and the method and rate of coal extraction. If subsidence should occur, oil and gas exploration and development could be limited or curtailed.

Impacts associated with the portal site depend on portal location, construction of a new portal or use of existing facilities, method of transportation and the amount of new disturbance. There are three concepts for a portal location for the "Proposed Action".

a. Mine the Tract from the Deer Creek Mine

Coal development would take place, but ancillary facilities would not need to be constructed for a mine extension. There may be some expansion and enlargement of existing facilities, such as a conveyor. Use of the surface resources on Section 32 could continue unchanged, as well as the uses in Meeting-house and Rilda Canyons. There would not be a behavioral avoidance problem with elk and deer winter range. There would not be an increase in the traffic congestion associated with Huntington Canyon. Air quality would decrease but still remain within standards.

- b. Mine the Tract through New Portal facilities in North Fork of Meetinghouse Canyon.

Coal development would take place and a new portal, transportation system and ancilliary facilities would be needed. There would be a behavioral avoidance problem with elk and deer winter range as about 40 acres of this range would be eliminated. New construction would require a rapid increase of demand for new people. This could have an impact on housing, schools and other municipal services if these people and their families move into the surrounding communities. The air quality would decrease but still remain within quality standards. The hydrologic regimen could be affected. Recreation in the canyon could be limited or curtailed.

- c. Mine the Tract Through New or Existing Facilities in Rilda Canyon.

Coal development would take place and new portal, transportation and ancillary facilities would be needed. Portal acreage would be the same for a new or former site, however, there would be less new disturbance utilizing a formerly disturbed site. There would be a behavioral problem with elk and deer winter range in Rilda Canyon. New construction would require a rapid increase of demand for new people. This could have an impact on housing, schools and other municipal services if these people and their families were to move into one city. This impact would be lessened depending on the number of actual new employees needed. The reconstruction of the road in Rilda Canyon could interrupt water service to the North Emery Water Users Association costumers should the line require reconstruction or relocation of the water transmission pipeline. Dust from hauling and portal activities could impact the riparian zone and creeks in Rilda Canyon. Traffic would increase on State Route 31 from hauling and shift changes. Safety on State Route 31 will decrease if the junction between State Route 31 and Rilda Canyon road is not improved.

- B. Other Committed Mitigation Measures Not Included in the Proposed Action or Alternatives.

1. The "No Action" Alternative

There are no mitigation measures that would be required to be committed to the adoption of this alternative.

2. The "Proposed Action"

- a. The following mitigation measures are recommended if the "Proposed Action" is adopted regardless of where the portal site is located.
- (1) Surface occupancy of the tract is restricted to exploration and monitoring purposes only.
 - (2) Prior to any surface disturbance, clearances for threatened and endangered plants, paleontology or cultural and historic resources are required.
 - (3) Floodplains, if any, will be determined prior to approval of any mine plan. The occupation of channels and floodplains shall be allowed only if no suitable alternative is available in accordance with Executive Order 11983.
 - (4) Prior to mining, the leasee shall perform a study to secure adequate baseline data to quantify the existing surface uses on and adjacent to the tract. The study will be established in consultation with and be contingent upon concurrences by the surface managing agency. The study shall be adequate to locate, quantify and demonstrate the inter-relationships of the geology, topography, surface hydrology, vegetation and wildlife. The baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.
 - (5) The leasee shall establish a monitoring system to locate, measure and quantify the progressive and final effects of underground mining activities on the topographic surface, surface and subsurface hydrologic regimen, soils and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of an infinite number of points over the base area. The monitoring shall be an extension of the base line data and shall be conducted by a method approved by the Office of Surface Mining (OSM) in consultation with and concurrence by the surface managing agency.
 - (6) All support facilities structures, equipment, and similar developments will be removed from the lease area within two years after the final termination of use of such facilities. All disturbed areas and those areas occupied by such facilities will be rehabilitated in accordance with an approved reclamation plan, and the "Surface Mining Control and Reclamation Act of 1977" as applicable.

- (7) All operations shall be conducted so as to comply with the Federal Water Pollution Control Act (33 U.S.C. 1151-1175) and the Clean Air Act (42 U.S.C. 1857 and the following.)
- (8) In accordance with Section 523 (b) of the "Surface Mining Control and Reclamation Act of 1977," reclamation operations conducted on this lease are to conform with the requirements of this Act and are subject to compliance with Office of Surface Mining Regulations.
- (9) If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with Forest Service regulations.
- (10) The lessee will be required to maintain a mine development and operation of a size that is compatible with the physical environment. The limited area available for mine facilities at the coal outcrop, steep topography, adverse winter weather, and physical limitations on the size and design of the access road, are factors which will determine the ultimate mine size.
- (11) Mining will be done in a manner to protect the escarpments.
- (12) Additional stipulations may be added as necessary upon conclusion of the hydrologic and transportation studies.

b. The following additional mitigation measures are recommended if the "Proposed Action" is adopted and the portal site is planned for Rilda Canyon.

- (1) Any road, portal or facility construction in Rilda Canyon will be coordinated with the existing facilities of North Emery Water Users Association.
- (2) The entrance and exit of coal hauling trucks onto and from State Route 31 and Rilda Canyon will be relocated or reconstructed to permit the safe and smooth merging with and departure from other traffic on State Route 31 as recommended by the Utah Department of Transportation and the surface managing agency.

C. Residual Unavoidable Adverse Impacts

The most significant impact will depend on the portal location. If the portal is located at Deer Creek, the greatest impact will be subsidence on the tract. If the portal is located in North Fork of Meetinghouse Canyon, the greatest impact will be the behavioral avoidance of wildlife, especially deer and elk. If the portal is in

Rilda Canyon, the greatest impact will be the additional traffic to a steep, narrow, curvy section of State Route 31 as well as possible disturbance of the water collection and transmission system.

Other adverse impacts include the degradation of the riparian zone in Rilda and Huntington Canyons, reduction of recreational activities due to increased mining use of Huntington and other canyons and visual degradation of the portal site and increased traffic.

D. Relationship Between Short Term Uses of Man's Environment and the Maintenance and Enhancement of Long Term Productivity.

There would be a gain of approximately nine million tons of coal available for market along with the creation of long term - well paying jobs for about 55 persons. Federal, state and local governments will benefit from royalties and taxes from the miners.

The coal that is mined is a nonrenewable resource and once it is mined, it is gone forever. Reclamation of disturbed areas can return them to equal or better use. The visual impact of a mine cut into steep canyon walls is considered permanent. Once the mining activity is finished, wildlife will migrate or can be transplanted to its former habitat.

E. Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources are: (1) the coal tract is mined, (2) the energy used to mine the coal and transport miners, machinery and coal, (3) the precise contour of area prior to construction of the portal and roads and (4) loss of life due to mine accidents, black lung and traffic accidents.

F. Net Energy Analysis: Coal Leasing

NET ENERGY SUMMARY SHEET

Site: Rilda Canyon (Section 32) Preliminary Tract with 195,000 ton annual production from tract portion of proposed large mining unit.

<u>All Numbers: Billion Btu</u>	<u>Annual</u>	<u>Life of Mine(40)</u>
1. Energy Output, Btu	4,950.0	198,000.0
2. Energy Input, (direct & indirect),Btu		
2.1 Production/Transportation		
Direct Operations		
Petroleum	26.2	1,048.0
Natural Gas	--	--
Coal	34.5	1,380.0
Hydro Power	--	--
Nuclear	--	--
Other	--	--
	<hr/>	<hr/>
Total	60.7	2,428.0
Ratio Output/Input	<hr/>	<hr/>
		81.5
Equipment, Facilities, & Supplies		
Petroleum	2.0	80.0
Natural Gas	11.4	456.0
Coal	5.0	200.0
Hydro Power	1.6	64.0
Nuclear	1.5	60.0
Other	--	--
	<hr/>	<hr/>
Total	21.5	860.0
Ratio Output/Input	<hr/>	<hr/>
		60.2

2.2 Infrastructure	<u>Annual</u>	<u>Life of Mine(40)</u>
Production Area		
Petroleum	18.4	736.0
Natural Gas	20.8	832.0
Coal	15.1	604.0
Hydro Power	--	--
Nuclear	--	--
Other	--	--
	<u>54.3</u>	<u>2,172.0</u>
Total		
Ratio Output/Input		<u>91.2</u>
Equipment and Supplies		
Petroleum	13.9	556.0
Natural Gas	12.1	484.0
Coal	3.8	152.0
Hydro Power	1.3	52.0
Nuclear	1.1	44.0
Other	--	--
	<u>32.2</u>	<u>1,288.0</u>
Total		
Ratio Output/Input		<u>153.7</u>
Total Infrastructure	86.5	3,460.0
Ratio Output/Input		<u>57.2</u>
2.3 Total 2.1 + 2.2		
Petroleum	60.5	2,420.0
Natural Gas	44.3	1,722.0
Coal	58.4	2,335.0
Hydro Power	2.9	116.0
Nuclear	2.6	104.0
Other	--	--
	<u>168.7</u>	<u>6,748.0</u>
Total		
Ratio Output/Input		<u>29.3</u>
Unrecovered Resource, Btu	<u>7,430</u>	<u>297,200</u>

Recommendations:

The Forest Service recommends that final determination on the proposed action be contingent upon information presented in the body of this report and the results of the following special studies.

An analysis of the hydrologic regime of Rilda Canyon and surrounding area to be conducted by Northwest Carbon Corporation and a detailed transportation analysis for State Route 31 to be completed by the Forest Service. Both these studies are to be completed in 1981.

V. CONSULTATION AND COORDINATION

This environmental Assessment has been prepared with input provided by Forest Service Interdisciplinary Team.

A. This team consisted of the following:

Robert Oldfield, Geologist, Team Leader
Ira W. Hatch, District Ranger
Walter E. Nowak, District Geologist
Brent Barney, Civil Engineer
Dan Larsen, Forest Soil Scientist
Dennis Kelly, Forest Hydrologist
Jim Duncan, Civil Engineer
Carol Morrison, Wildlife Biologist
Steve Spencer, Range Conservationist
William Keis, Physical Science Technician
Gale Madyun, Physical Science Technician

B. Others Consulted for this Project:

John Niebergall, District Ranger, Ferron Ranger District
Ron Dickemore, District Range Conservationist
Sam Hotchkiss, Geologist
Dwain McGarry, Geologist
Gerry Liebing, Geologist, USGS
Al Anundson, Engineer, Northwest Carbon
Bob Johnson, Mining Engineer, Northwest Carbon
Candance Clark, Geologist, USGS
Sid Vogopohl, Geologist, BLM

APPENDIX A

Bibliography

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- J. Environmental Assessment/Technical Examination, Readjustment of Federal Coal Lease No. U-024319, 1979, prepared by U.S. Forest Service.
- K. Mining and Reclamation Plan for the Proposed Rilda Canyon Mine, Lease No. U-7653, SL-050862, ML-22509, ML019342, November 1976, prepared by Sanders Associates, Inc.
- L. Coal Lease Modification for Federal Lease No. U-02664, October 1978, prepared by U.S. Forest Service.
- M. Mine Plan Modification for Federal Lease No. U-02664, January 1980, prepared by U.S. Forest Service.
- N. Coal Lease Readjustment for Federal Lease No. SL-070608, 1976. Prepared by U.S. Forest Service.

- O. Environmental Assessment for the Proposed Meetinghouse Canyon Tract, July 1980. Prepared by the U.S. Forest Service.
- P. Situation Statement for Section 32, T16S, R7E, SLM, June 1980. Prepared by the U.S. Forest Service.
- Q. The Central Coal II Project: A Class II Inventory of Selected Portions of Carbon, Emery, and Sevier Counties, Utah, by New World Research Inc., 1980.
- R. Final Environmental Statement, Central Utah E.S., 1979.

DECISION NOTICE
AND
FINDING OF NO SIGNIFICANT IMPACT
FOR THE READJUSTMENT OF
CONSOLIDATED FEDERAL COAL LEASE SL-050862/U-24069/U-24070

Price Ranger District
Manti-LaSal National Forest
Emery County, UT

On March 10, 1986, the Forest Service received notification from the Bureau of Land Management that consolidated Federal coal lease SL-050862/U-24069/U-24070 would be subject to readjustment of terms on August 5, 1987. This notification also requested an environmental assessment, recommendations for stipulations, and Forest Service consent, as appropriate.

An Environmental Assessment (EA) approved December 29, 1986, adequately addressed the environmental conditions and effects of the proposed action. Copies of this and other pertinent process documentation are available for review at the Price Ranger District Office and the Manti-LaSal National Forest Supervisor's Office, both located in Price, Utah.

Based on the analysis and evaluation described in the aforementioned documents, it is our decision that the special stipulations identified in the EA be included in the proposed readjustment of the subject lease. This alternative is viable under existing legislation and Forest Service policy, management decisions, and direction. The "No Action" alternative was evaluated and determined not to be viable.

This is not a major Federal action that would significantly affect the quality of the human environment; therefore, an Environmental Impact Statement is not needed. This determination was made considering the following factors:

1. All future proposed surface-disturbing activities will be site-specifically assessed through the NEPA process.

2. All identified impacts, including cumulative impacts, can be effectively mitigated to an acceptable level.

3. No known prime or unique farmlands, wetlands, timberlands or rangelands; floodplains, alluvial valley floors, paleontological or cultural resources; nor threatened, endangered, or sensitive floral or faunal species will be impacted by readjustment of this lease.

4. Readjustment of this lease is consistent with the direction and decisions of the Manti-LaSal National Forest Final Environmental Impact Statement and the Land and Resource Management Plan dated November 5, 1986.

Based on this assessment and evaluation, consolidated Federal Coal Lease SL-050862/U-24069/U-24070 should be readjusted to contain the enclosed stipulations. This decision is subject to administrative review (appeal) pursuant to Secretary of Agriculture Appeal Regulation 36 CFR 211.18.

J. S. Tixier
J. S. TIXIER
Regional Forester

DATE

Jan 30, 1987

ENVIRONMENTAL ASSESSMENT
FOR THE READJUSTMENT OF CONSOLIDATED
FEDERAL COAL LEASE SL-050862/U-24069/U-24070

Price Ranger District
Manti-LaSal National Forest
Emery County, Utah

December, 1986

Responsible Official: Reed C. Christensen
Forest Supervisor
Manti-LaSal National Forest
U.S. Department of Agriculture

For Further Information Contact: Ira W. Hatch
Price District Ranger
599 West Price River Drive
Price, Utah 84501

Prepared by: Walter E. Nowak, Price District Geologist

Approved by: Reed C. Christensen Date 12/29/86
Forest Supervisor

ENVIRONMENTAL ASSESSMENT
READJUSTMENT OF CONSOLIDATED FEDERAL COAL LEASE
SL-050862/U-24069/U-24070

I. INTRODUCTION

A. Purpose and Need for Action

The Bureau of Land Management sent notification to the Forest Service on March 10, 1986 that consolidated Federal Coal Lease SL-050862/U-24069/U-24070 (currently assigned to West Appa Land Company) would be subject to readjustment of terms by August 5, 1987. (See Appendix A)

As the surface managing agency for this lease, the Manti-LaSal National Forest is responsible for conducting an environmental analysis of the proposed action in accordance with the National Environmental Policy Act of 1969 (NEPA).

A Forest Service interdisciplinary (ID) team met on September 3, 1986 to evaluate the proposed lease readjustment. (See Appendix C).

B. Authorizing Actions

Leasing and development will be under the authority of the following authorizing actions: Mineral Leasing Act of February 25, 1920, as amended; Federal Land Policy and Management Act (FLPMA) of 1976; Surface Mining and Development Act of August 13, 1954; Department of Energy Operations Act of August 4, 1977; National Environmental Policy Act (NEPA) of 1969; Federal Coal Leasing Amendments Act of October 30, 1976, as amended; the Act of October 30, 1978 (92 Stat. 2073-2075); regulations: Title 30 CFR Part 700; Title 43 CFR Part 3400; and the Manti-LaSal National Forest Final Environmental Impact Statement and Land and Resource Management Plan, 1986.

C. Description of the Lease

The lease area is contained on Federal lands within the Price Ranger District, Manti-LaSal National Forest, Emery County, Utah (see map). It consists of 280 acres and is legally described as follows:

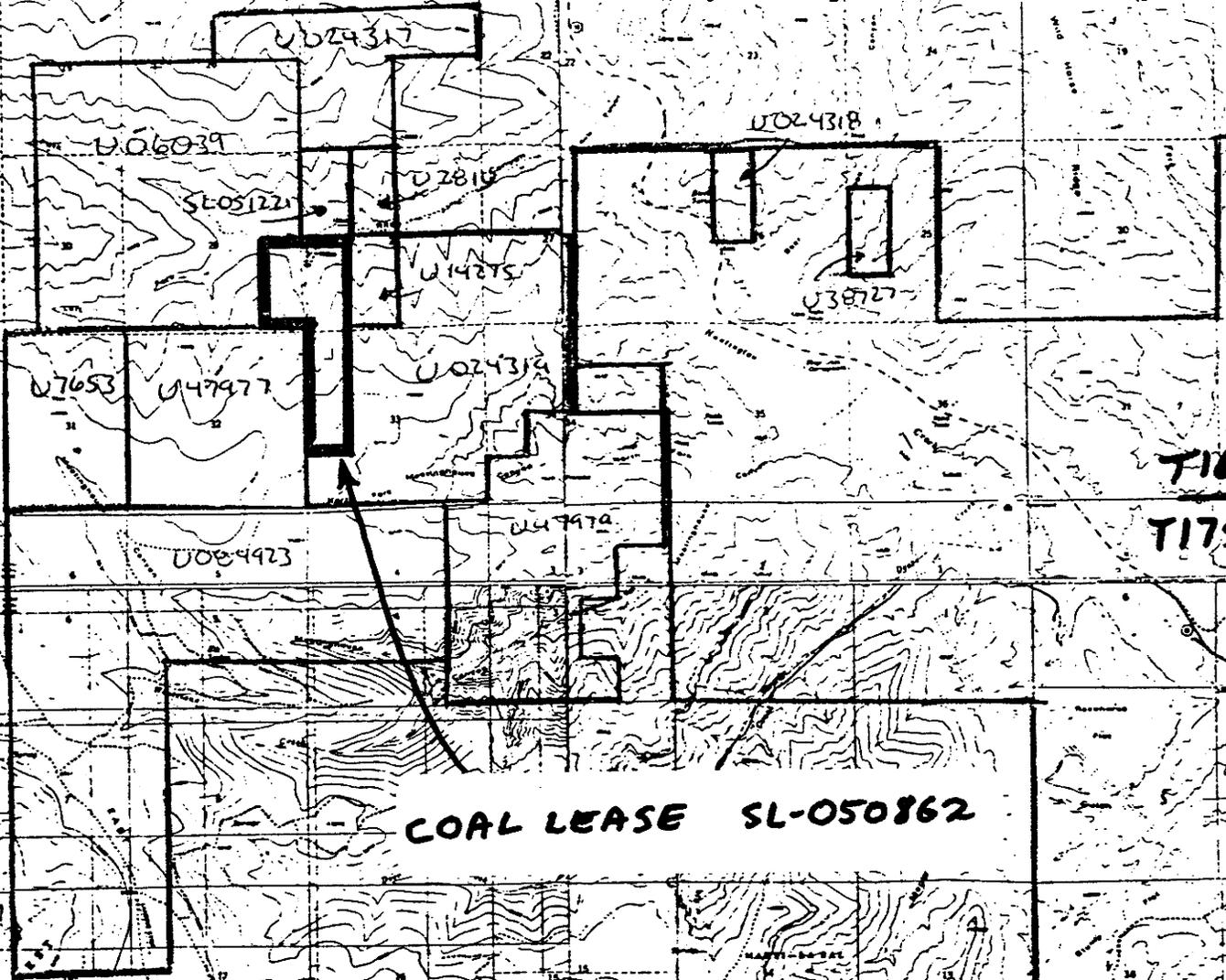
T16S, R7E, SLM, Emery Co., Utah
Section 28: W1/2 SW1/4
Section 29: E1/2 SE1/4
Section 33: W1/2 NW1/4, NW1/4 SW1/4

R6E | R7E

R7E | R8E

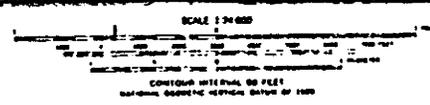
T16S
T17S

T16
T17S



COAL LEASE SL-050862

Map made, edited, and published by the Geological Survey
 Control by USGS, WASHINGTON, and U.S. Forest Service
 Control by proprietary details from forest photographs
 taken 1970. Last printed 1974. Map scale 1:50,000
 Projection and 10 000-foot grid system. 1983
 approximate datum. 1983 datum adjustment used.
 1983 datum adjustment. 1983 datum adjustment used.
 Date 12 March 1983. 1:50,000 scale.
 This map was prepared under contract to the
 National Coal Resource Survey.



FOR SALE BY U.S. GOVERNMENT PRINTING OFFICE: 1983. 0-832-108-1000
 A POLAROID COPY OF THIS MAP IS AVAILABLE FOR \$1.00 PER COPY.

D. Background

Before consolidation, Coal Leases SL-050862, U-24069 and U-24070 were respectively issued on August 5, 1937, May 1, 1953 and May 1, 1960. On October 18, 1973 these leases were consolidated by the Bureau of Land Management on request of the original lessee, Malcolm N. McKinnon. On June 1, 1983, the Bureau of Land Management approved the assignment to the current lessee of record, West Appa Land Company.

The Old Helco Mine, lying within the lease along its northern edge in Rilda Canyon, was originally active in 1938. The Old Helco Mine was abandoned in 1969 and was one of four operating mines in Rilda Canyon that together produced less than 100,000 tons. Since then, three different companies have tentatively proposed to reactivate operations at the Old Helco Mine; but, all have dropped their proposals. Currently, West Appa Land Company is negotiating to sell the subject lease along with three other adjacent State and Federal coal leases.

E. Issues and Concerns

General public comments were solicited through local newspapers on 10/10/86. Specific comments on the proposed action were solicited directly from the Emery County Planning and Zoning Commission, the Utah Division of Wildlife Resources and the Southern Utah Association of Governments on 10/30/86. No comments or responses have been received to date.

The Interdisciplinary Team identified the following management concerns:

1. Surface disturbing activities and facilities could adversely affect surface water and wildlife.
2. Underground mining and subsidence could adversely affect surface and ground water, soils, vegetation, wildlife and North Emery Water Users Association's culinary water development.

F. Negative Declaration

The ID Team determined that this action after mitigation, would cause no impacts on the following; prime or unique rangeland, timberland or farmland; floodplains; cultural or paleontological resources; wetlands; alluvial valley floors; known Threatened, Endangered or Sensitive plant or animal species.

II. DESCRIPTION OF ALTERNATIVES

A. No Action Alternative

Consideration of the "No Action" alternative is required by Section 1502.14 (d) of the National Environmental Policy Act and by the council on Environmental Quality guidelines as specified in the Federal Register on November 29, 1979. Under this alternative, the terms of the lease would not be changed.

Department of Interior Regulations 43 CFR 3451.1 (a) (1) Federal Coal Management Regulations require that all leases issued prior to August 4, 1976, be subject to readjustment at the end of the current 20 year period and at the end of each 10 year period thereafter. The present lease terms do not minimize the impacts to the surface resources to an acceptable level, and new management requirements are needed.

B. Readjustment of Terms Alternative

Department of Interior Regulations 43 CFR 3400.3-1 pertaining to Coal Management make provisions for the Surface Management Agency, the surface of which is under the jurisdiction of any Federal agency other than the Department of Interior, to consent to leasing and to prescribe conditions to insure the use and protection of the lands. This lease contains lands the surface of which are managed by the United States Department of Agriculture, Forest Service, Manti-LaSal National Forest.

The stipulations contained in Appendix B pertain to the Lessee responsibility for mining operations on the lease area and on adjacent areas as may be specifically designated on National Forest System lands.

III. AFFECTED ENVIRONMENT

The affected environment of the subject area has been generally described in numerous environmental documents and resource reports prepared for coal leasing and development in this and surrounding areas. A number of these documents are listed for reference in Section VI, Selected Tiering and Reference Documents. There are several resources on the lease for which an issue or concern was identified. These resources are essentially, unique to the proposal and are under consideration in this document.

A. General Setting

The lease lies along the south slope of Rilda Canyon. Rilda Creek traverses the north edge of the lease in an east-west

direction and a tributary to Rilda Creek, often called "Side Canyon", traverses the north half of the lease in a north-south direction. The southern portion of the lease includes a portion of the ridge which separates Rilda Canyon from the North Fork of Meetinghouse Canyon. The elevation within the lease area ranges from 7,600 feet at the north end in the canyon bottom to approximately 9,400 feet at the south end on the ridge.

B. Hydrology

A north-south trending intermittent side drainage traverses the lease area and drains into Rilda Creek. Rilda Creek flows eastward into Huntington Creek. Perennial flows in Rilda Creek are fed by springs which emerge along the canyon slopes.

Three spring areas which lie within the lease area have been developed by the North Emery Water Users Association (NEWUA) for culinary water. The North Spring and South Spring Collection Areas lie in the bottom of Rilda Canyon on both sides of the creek along the northern edge of the lease.

The Side Canyon Collection Area lies to the south of the other collection areas in the bottom of the side drainage. Collection system pipelines traverse the canyon bottom on both sides of the creek and merge into one pipe at the northeast corner of the lease. The pipe leads eastward along the north edge of the Rilda Canyon road.

No other perennial springs have been found in the lease area.

Vaughn Hansen Associates, Inc. prepared a detailed hydrologic study of the Rilda Canyon area for West Appa Coal Company's Mine and Reclamation Plan for the Rilda Canyon Mine, April, 1983, Chapter VII. Detailed information of the hydrology of the area can be found in this report.

C. Soils

The soils in the area were mapped in detail by Ford, Bacon and Davis, Inc. for West Appa Coal Company's Mine and Reclamation Plan for the Rilda Canyon Mine, April, 1983, Chapter VIII.

Typically, soils in area have brown or dark brown sandy loam surfaces 12-21 inches thick underlain by a pale brown sandy loam or loam subsoil to a depth of 60 inches or more. Soils generally contain a high amount of rock fragments ranging from small stones to massive boulders. Based on data from the Ford, Bacon and Davis report it appears that the soils located in the area have 2 major limitations which could adversely affect revegetation attempts:

- (1) Soil laboratory analysis shows a serious deficiency in the nutrient phosphorous.
- (2) Soils have a very high or high erosion potential if disturbed.

D. Wildlife and Fish

There is a variety of wildlife in the lease area due to the diversity of elevations and plant communities. The ridge tops are both summer and winter range for elk and deer. During the winter months, mule deer driven off of the higher elevations, utilize the south facing slopes of Rilda Canyon that stay relatively free of snow. The area may also be home for cougar and black bear. The bird population includes game birds, raptors and small nongame birds. Small nongame animals which inhabit the area include bobcat, coyote, fox, badger, beaver, porcupine, skunk, mink, weasel, marmot, gopher, chipmunk, several species of squirrels and mice.

Rilda Creek is not a fishery however, Huntington Creek is a valuable fishery in the area.

A detailed description of the wildlife in and adjacent to the lease area was prepared by Ford, Bacon & Davis, Inc., for West Appa Coal Company's Mine and Reclamation plan for the Rilda Canyon Mine, April 1983, Chapter X.

A raptor survey conducted by Ford, Bacon & Davis, Inc. in 1982 showed that there were no active nests within the lease area.

E. Vegetation

The dominant vegetation communities on north exposures and aspects is the alpine fir-Englemann spruce-ribes type with some aspen trees mixed in. The southern exposures and aspect are mostly covered with big sagebrush-grass types on the gentler lower slopes and mountain brush (Mahogany) types on the rockier, steeper slopes. Bunchgrass types (wildrye-wheatgrasses) dominate the more open windblown ridges and steep upper slopes. The canyon and stream bottoms are dominated by cottonwood trees, willows and several species of undershrubs, grasses and sedges.

There are presently no listed Threatened, Endangered or Sensitive plant species in the lease area.

IV. ENVIRONMENTAL CONSEQUENCES

A. Effects of Implementation

There would be no effects to the environment unless coal is produced from the lease and/or surface disturbing operations are conducted.

If the lease is mined, effects would result from deformation of the overburden and subsidence of the land surface. Additional effects would result from any surface disturbing activities such as coal exploration, construction of surface facilities for mining and the other activity associated with surface operations.

The environmental consequences for both alternatives will be essentially the same but may differ in magnitude. Under the terms and conditions contained in the existing lease (No Action Alternative) the environmental consequences may not be as thoroughly mitigated and potential operators may not receive advance notice of requirements for development of the lease.

If the lease is readjusted, the stipulations contained in Appendix B would be included in the lease and the anticipated effects would be mitigated to the maximum degree practical.

B. Short-Term and Residual Impacts

Surface disturbing operations would result in degradation of surface water quality, removal of vegetation and the associated disturbance to wildlife from human activities and presence.

If the lease is mined, subsidence would occur at the surface. The amount and extent of subsidence would depend on the mining method, configuration of the workings, number of seams mined and the geologic factors which control the strength of the overburden. Stresses and deformations produced in mine workings, other coal seams and the overburden may affect mine safety, extraction efficiency, ground water flow and the surface environment.

Subsidence begins almost immediately upon mining and may continue for many years after the workings are abandoned. The rate, extent and amount of subsidence will vary with the geologic conditions and mining operations.

It is expected that mining and subsidence will have an effect upon the natural ground water flow which may, in turn, result in effects to surface water, soils, vegetation, wildlife habitat and land uses.

C. Short-Term Use Vs. Long-Term Productivity

Construction of facilities and operations would involve long-term uses and disturbance. The duration would be dependent on the life of the mining operation and the additional time required for revegetation of the disturbed areas following reclamation.

Underground mining and subsidence could involve long-term alteration of the ground water flow and associated effects to surface resources.

The long-term productivity could be altered as drainages, soils and vegetation gradually adjust to any modified ground water conditions. The productivity could decrease or increase depending on the amount of available water.

D. Irreversible and Irretrievable Commitments of Resources

The resources that would be consumed in coal extraction would not be retrievable, and not available to be used elsewhere once expended. After the coal is mined, its use by future generations would be irreversibly lost, and the coal left in the ground would not be retrieved.

Subsidence may result in the irreversible commitment of some of the discussed resources.

E. Cumulative Effects

Cumulative effects could include the effects from subsidence, the effects associated with surface disturbing operations such as coal exploration and construction of mining facilities, and the human activity from continued operations.

Disturbance already existing in the lease area include the old Helco Mine facilities and workings the NEWUA water development, grazing and the Rilda Canyon road.

V. PERSONNEL AND PUBLIC INVOLVEMENT

A. I.D. Team Members and Consultants

See Appendix C

B. Public Involvement

See Section I.E.

VI. SELECTED TIERING AND REFERENCE DOCUMENTS

- A. Manti-LaSal National Forest Environmental Impact Statement and Land and Resource Management Plan, 1986.
- B. Manti-LaSal National Forest Environmental Assessment - Proposed Coal Lease Tract, Section 32, T16S, R7E, SLM, Emery County, Utah.
- C. West Appa Coal Co. Mine and Reclamation Plan for the Rilda Canyon Mine, April 1983.

Hydrology - Chapter VII, Hydrology, Prepared for West Appa Coal Co., Price, Utah by Marv Allen, Vaughn Hansen Associates, Inc., Salt Lake City, Utah, April 1983.

Soils - Chapter VIII, Soil Resources, Prepared for West Appa Coal Co., Price, Utah, Prepared by Randolph B. Gainer, Ford, Bacon and Davis, Salt Lake City, Utah, April 1983.

Wildlife - Chapter X, Fish and Wildlife Resources prepared for West Appa Coal Co., Price, Utah, Prepared by Jack A. Elder, Ph.D., Ford, Bacon and Davis, Inc., Salt Lake City, Utah, April 1983.

VII. APPENDICES

- A. BLM letter and copy of lease
- B. Recommended Stipulations
- C. F.S. I.D. Team

APPENDIX A



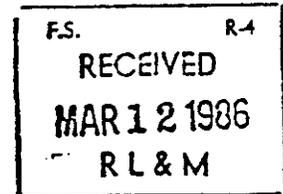
United States Department of the Interior

BUREAU OF LAND MANAGEMENT
UTAH STATE OFFICE
324 SOUTH STATE, SUITE 301
SALT LAKE CITY, UTAH 84111-2303

IN REPLY REFER TO

3451
SL-050862
U-24069
U-24070
(U-942)

MAR 10 1986



Mr. Stan Tixier
Regional Forester
Forest Service
324 25th Street
Ogden, Utah 84401

Dear Stan:

The following coal lands under the administration of the Forest Service will be subject to the readjustment of its terms and conditions on August 5, 1987.

Serial Number

Lessee

SL-050862 - U-24069
U-24070

W A Land Company

The regulations in 43 CFR 3451.1(c)(1) and (2), governing coal readjustments, state that:

(1) The authorized officer shall, prior to the expiration of the current or initial 20-year period or any succeeding 10-year period thereafter, notify the lessee of any lease which becomes subject to readjustment after June 1, 1980, whether any readjustment of terms and conditions will be made prior to the expiration of the initial 20-year period or any succeeding 10-year period thereafter..., and

(2) In any notification that a lease will be readjusted under this subsection, the authorized officer shall prescribe when the notice of readjusted lease terms shall be transmitted to the lessee. This time shall be as soon as possible after notice that the lease shall be readjusted, but shall not be longer than 2 years after such notice. Failure to transmit the notice of readjusted lease terms in the specified period, shall constitute a waiver of the right to readjust, unless the delay is caused by events beyond the control of the Department.

We are providing this opportunity for the Forest Service to develop recommendations for stipulations you feel would be appropriate for this readjusted lease. A copy of the current lease form is enclosed to assist in the completion of the environmental assessment.

↑
~~Not enclosed.~~

Instructions from our Washington Office require that we notify the lessee of the proposed readjustment terms no later than February 5, 1987. Therefore, we are requesting that the E.A. and recommended stipulation be available to this office by that date. If you anticipate any problems please advise.

Sincerely,

A handwritten signature in black ink, appearing to read "W. R. Papworth". The signature is written in a cursive style with a large, sweeping initial "W".

W. R. Papworth
Deputy State Director,
Operations

Enclosure
Copy of Lease

UNITED STATES
DEPARTMENT OF THE INTERIOR

U. S. LAND OFFICE AT Salt Lake City

SPHAI. No. 050862

MINING LEASE OF COAL LANDS UNDER ACT OF FEBRUARY 25, 1920

This indenture of lease, entered into, in quintuplicate, this 20th day of February, 1920, by and between the United States of America, acting in this behalf by the First Assistant Secretary of the Interior, party of the first part, hereinafter called the lessor, and J. B. Johnson, party of the second part,

hereinafter called the lessee, under, pursuant, and subject to the terms and provisions of the act of Congress, approved February 25, 1920 (41 Stat. 437), entitled "An act to promote the mining of coal, phosphate, oil, oil shale, gas, and sodium on the public domain," hereinafter called the "act,"

WITNESSETH:
That the lessor, in consideration of the rents and royalties to be paid and the covenants to be observed as hereinafter set forth, does hereby grant and lease to the lessee the exclusive right and privilege to mine and dispose of all the coal in, upon, or under the following described tracts of land, situated in the State of Utah,
to wit: W. 1/4 Sec. 28, T. 16, S. 4, R. 7, E. 1, S. 1, M., containing 80 acres, more or less, together with the right to construct all such works, buildings, plants, structures, and appliances as may be necessary and convenient for the mining and preparation of the coal for market, the manufacture of coke or other products of coal, the housing and welfare of employees, and subject to the conditions herein provided, to use so much of the surface as may reasonably be required in the exercise of the rights and privileges herein granted.

SECTION 1. That the lessor expressly reserves:
(1a) The right to permit for joint or several use such easements or rights of way, including easements in tunnels upon, through, or in the land leased, occupied, or used as may be necessary or appropriate to the working of the same or other lands containing the deposits described in said act, and the treatment and shipment of the products thereof by or under authority of the Government, its lessees or permittees, and for other public purposes.
(1b) The right to lease, sell, or otherwise dispose of the surface of said lands or any part thereof under existing law or laws hereafter enacted, in so far as said surface is not necessary for the use of the lessee in the mining and removal of the coal therein, and to lease other mineral deposits in the lands, under the provisions of said act.
(1c) Full power and authority to carry out and enforce all the provisions of Section 30 of said act to insure the sale of the production of said leased lands to the United States and to the public at reasonable prices, to prevent monopoly; and to safeguard the public welfare.

SECTION 2. The lessee in consideration of the lease of the rights and privileges aforesaid hereby covenants and agrees as follows:

- (2a) To invest in actual mining operations, development, or improvements upon the land leased, or for the benefit thereof, the sum of one thousand dollars, of which sum not less than one-third shall be so expended during the first year succeeding the execution of this instrument and a like sum each of the two succeeding years, unless sooner expended; and submit annually, at the expiration of each year for the said period, an itemized statement of the amount and character of said expenditure during such year.
- (2b) To furnish a bond in the sum of \$1,000, conditioned upon the expenditure of the amount specified in (2a) hereof and upon compliance with all the other terms of the lease. (In case of a \$10,000 bond, a bond in the sum of \$5,000 may be substituted after the investment requirement has been met.)
- (2c) To pay as an annual rental for each acre or part thereof covered by this lease, the sum of 25 cents per acre for the first year, payment of which amount is hereby acknowledged, the sum of 50 cents per acre per year for the second, third, fourth, and fifth years, and \$1 per acre for the sixth and each succeeding year during the life of

this lease, all such annual payments of rental to be made to the register of the United States Land Office of the district in which said land is situated, on the anniversary of the date hereof, and to be credited on the first royalties to become due hereunder during the year for which said rental was paid.

(24) To pay to such register a royalty of15..... cents on every ton of 2,000 pounds of coal mined during the first 20 years succeeding the execution of this lease. Royalties shall be payable quarterly within 30 days from the expiration of the quarter in which the coal is mined.

(25) To determine accurately the weight of all coal mined from the leased premises, and to accurately enter the weight or weights thereof in due form in books to be kept and preserved by the lessee for such purpose.

(26) To furnish quarterly, within 30 days after the expiration of the quarter, a written report covering such quarter, certified under oath by the superintendent of the mine, or by such other agent having personal knowledge of the facts as may be designated by the lessee for such purpose, showing the number of tons of 2,000 pounds of coal mined during the quarter, the character and quality thereof, amount of coal and products and by-products thereof disposed of and price received therefor, amount of coal and its products in storage or held for sale, and amount used in operations under this lease.

(27) Also to furnish annually, and at such other times as the Secretary of the Interior may require, in the manner and form prescribed by the Secretary of the Interior, plat, map, or tracings showing all development work and improvements upon the leased lands, and other related information, with a report as to all buildings, structures, or other works placed in or upon the leased lands, a statement as to the amount and grade of coal produced and sold, and amount received therefor by operations hereunder, and, if a corporation, the amount of capital stock and list of its stockholders.

(28) To keep at the mine office clear, accurate, and detailed maps, on a scale not more than 200 feet to the inch, in the form of horizontal projections on tracing cloth, of the workings in each coal bed in each separate mine on the leased lands, a separate map to be made for each such bed, and for the surface immediately over the underground workings, and to be so arranged with reference to a public land corner that the maps can be readily superimposed.

Each map of the workings in any coal bed shall show the thickness of the coal and of partings, and the dip and strike of each bed at intervals of 500 feet or less; the location of all openings connecting such bed with the workings in any other bed, or with any adjacent mine, or with the surface; the location of all entries, gangways, rooms, or breasts, and all other mine openings, shafts, airways, appliances, and devices, constructed or placed in the mine or any of the workings thereof; and such maps shall also show the elevation relative to sea level or a Government survey corner of the principal points of the various beds and workings.

Blue prints or reproductions in duplicate of the maps required as aforesaid shall be furnished the lessor when made, and supplemental prints or reproductions in duplicate furnished on or before the first day of each succeeding year, showing the extensions, additions, and changes since the last map or supplement was submitted. All mine progress maps kept by the lessee shall at all times be subject to examination by lessor.

(29) That, beginning with the fourth year of the lease, except when such operation shall be interrupted by strikes, the elements, or casualties not attributable to the lessee, the lessee shall mine and pay a royalty on not less than550..... tons of coal per year, unless on application and showing made, operations shall be suspended for not exceeding six months at any one time, pursuant to section 7 of the act; or unless the lessee shall pay the royalty less rent, on such minimum amount of coal, for one year in advance, in which case operations may be suspended for that year.

(30) That the lessee shall not assign this lease or any interest therein, nor sublet any portion of the leased premises without the written consent of the lessor being first had and obtained.

SECTION 3. It is mutually understood and agreed that the lessor shall have the right to readjust and fix the royalties payable hereunder and other terms and conditions at the end of 20 years from the date hereof, and thereafter at the end of each succeeding 20-year period during the continuance of this lease unless otherwise provided by law at the time of the expiration of any such period, but in case the lessee be dissatisfied with the rate of royalty or other terms and conditions so fixed, he may terminate this lease in the manner and under the conditions provided in Sections 6 (b) and 6 (c) hereof.

Section 3. The lessee, in consideration of the rights herein granted, agrees to comply with the terms and provisions of the "Bituminous Coal Conservation Act of 1935" approved August 30, 1935, so long as said act shall remain in effect, and to abide by

SECTION 4. This lease is made subject to the following provisions, which the lessee accepts and covenants faithfully to perform and observe, unless the laws of the State where the leased land or deposits are situated otherwise provide, in which case such State laws control:

(4a) The lessee shall carry out and observe regulations prescribed by the Secretary of the Interior and in force at the date hereof relative to (1) reasonable diligence, skill, and care in the operation of said property in accordance with approved methods and practices; (2) the prevention of undue waste; (3) the safety and welfare of miners; and (4) insuring the fair and just weighing or measurement of the coal mined by each miner.

(4b) And also shall pay all miners and other employees, both above and below ground, at least twice each month in lawful money of the United States, and shall permit such miners and other employees full and complete freedom of purchase, but with a view to increasing safety this provision shall not apply to the purchase of explosives, detonators, or fuses; and shall not require or permit miners or other employees, except in case of emergency, to work underground for more than eight hours in any one workday, and shall not employ any boy under the age of 16 years, or any girl or woman without regard to age in any mine below the surface.

SECTION 5. And the lessee also expressly agrees that all mining and related operations shall be subject to the inspection of authorized representatives of the lessor, and that such representatives, with all proper and necessary assistants, may at all reasonable times enter into and upon the leased lands and survey and examine same and all surface and underground improvements, works, machinery, equipment, and operations.

(5a) And also shall permit the lessor to examine all books and records pertaining to operations under this lease, and to make copies of and extracts from any or all of same, if desired.

(5b) And also shall permit the lessor or its lessees or transferees, with the approval of the lessor, to make and use upon or under the leased lands any workings necessary for freeing any other mine from water or gas, or extinguishing fires, causing as little damage or interference as possible to or with the mine or mining operations of the lessee hereunder; provided, that any such use by a transferee or another lessee shall be conditioned upon the payment to the lessee hereunder of the amount of actual damages sustained thereby and adequate compensation for such use.

(5c) And also shall, at the termination of this lease, as the result of forfeiture thereof, pursuant to paragraph (6d), deliver up to the lessor the lands covered thereby, including all fixtures, machinery, improvements, and appurtenances, other than strictly personal property, situate on any of said lands, in good order and condition, so as to permit of immediate continued operation to the full extent and capacity of the leased premises.

SECTION 6. It is further mutually understood and agreed as follows:

(6a) That the lessor may, in writing, waive any breach of the covenants and conditions contained herein, except such as are required by the act, but any such waiver shall extend only to the particular breach so waived, and shall not limit the rights of the lessor with respect to any future breach; nor shall the waiver of a particular cause of forfeiture prevent cancellation of this lease for any other cause, or for the same cause occurring at another time.

(6b) The lessee may, on consent of the Secretary of the Interior first had and obtained, surrender and terminate this lease upon payment of all rents, royalties, and other debts due and payable to the lessor and upon payment of all wages or moneys due and payable to the workmen employed by the lessee, and upon a satisfactory showing to the Secretary of the Interior that the public interest will not be impaired; and the lessee may with like consent surrender any legal subdivision of the area included within the lease; but in no case shall such termination be effective until the lessee shall have made provision for the preservation of any mines or productive works or permanent improvements on the lands covered hereby.

(6c) That on the termination of this lease, pursuant to the last preceding paragraph, the lessor, his agent, licensee, or lessee shall have the exclusive right at the lessor's election to purchase at any time within six months thereafter, at the appraised value, any or all buildings, machinery, tools, or other property placed by the lessee in or on the lands leased hereunder, save and except all underground timber and such other supports and structures as are necessary for the protection and preservation of the mine, which shall be and remain a part of the realty without further consideration or compensation; that the purchase price to be paid for said buildings, machinery,

equipment, tools, or other property to be purchased as aforesaid shall be fixed by appraisal of three disinterested and competent persons (one to be designated by each party hereto and the third to be selected by the two so designated), the valuation so determined by the three or a majority of them to be conclusive and binding upon both parties; that pending such election to purchase within the said period of six months none of the buildings or other property shall be removed from their normal position; that if such valuation be not requested or the lessor shall affirmatively, in writing, elect not to purchase within said period of six months, the lessee shall have the privilege of removing said buildings, machinery, equipment, tools, and other property within 90 days after being notified in writing by the lessor that the said lessor does not elect to purchase any or all of the buildings, machinery, equipment, tools, or other property, and in case of failure to so remove the said property within 90 days after receipt of such notice, then said buildings, machinery, tools, or other property shall become the property of the United States.

(6d) If the lessee shall fail to comply with the provisions of the act or make default in the performance or observance of any of the terms, covenants, and stipulations hereof, or of the general regulations promulgated and in force at date hereof, the lessor may institute appropriate proceedings in a court of competent jurisdiction for the forfeiture and cancellation of this lease as provided in Section 81 of the act, but this provision shall not be construed as depriving the lessor of any legal or equitable remedy which the lessor might otherwise have.

SECTION 7. It is further covenanted and agreed that, should the lessee fail to take prompt and necessary steps to prevent loss or damage to the mine, property, or premises, or danger to the employees, the lessor may enter on the premises and take such measures as may be deemed necessary to prevent such loss or damage or to correct the dangerous or unsafe condition of the mine or works thereof, which shall be at the expense of lessee.

SECTION 8. It is further covenanted and agreed that each obligation hereunder shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

SECTION 9. It is also further agreed that no member of or delegate to Congress, or resident commissioner, after his election or appointment, or either before or after he has qualified, and during his continuance in office, and that no officer, agent, or employee of the Department of the Interior, shall be admitted to any share or part in this lease, or derive any benefit that may arise therefrom, and the provisions of Section 3741 of the Revised Statutes of the United States and Sections 114, 115, and 116 of the Constitution of the Penal Laws of the United States, approved March 4, 1909 (35 Stat. 1109), relating to contracts, enter into and form a part of this lease so far as the same may be applicable.

IN WITNESS WHEREOF:

THE UNITED STATES OF AMERICA,

Robert C. Chapin
Assistant Secretary of the Interior
Assistant Secretary of the Interior, Lessee.

J. B. Johnson
Lessee.

WITNESSES:

Laura D. Griffin
Wm. J. Johnson
Wm. J. Johnson
A. J. Allen

73 OCT 17 PM 3:45

RECEIVED
MAY 20 1966
R.L.C.M.

UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Land Management

BUREAU OF LAND MGMT.

Office Salt Lake

Serial Nos. SL 050862-U 24069-U 24070

**CONSOLIDATED COAL LEASE UNDER SECTION 5,
ACT OF FEBRUARY 25, 1920 (41 STAT. 437), AS AMENDED**

This lease, entered into on November 1, 1973, as of August 5, 1974, by the United States of America, the lessor, through the Bureau of Land Management, and Malcolm N. McKinnon, the lessee,

WITNESSETH:

THAT, WHEREAS, the lessee is the record holder of Coal Leases SL 050862, U 24069 and U 24070, issued by the lessor August 5, 1937, May 1, 1953, and May 1, 1960, respectively, under the Act of February 25, 1920 (41 Stat. 437), as amended, which embraces certain described lands in the State of Utah,

AND, WHEREAS, upon application made by the lessee for consolidation of the above leases, it has been found that it will be in the interest of the United States to consolidate the leases.

NOW, THEREFORE, the lessor, in consideration of the rents and royalties to be paid, and the covenants to be observed as set forth in said leases, does hereby consolidate the leases subject to the following conditions.

- (a) That the rental on the lands embraced in the leases as consolidated herein shall be payable on the date and at the rate applicable to the lands embraced in the senior lease, SL 050862.
- (b) Royalty of 15¢ on every ton of 2,000 pounds of coal mined will be required until readjustment of the lease terms.
- (c) That the minimum production shall be 5,000 tons of coal per year or pay a royalty on this production.
- (d) That all of the other terms and conditions of the leases in effect on date hereof shall be unaffected hereby, and shall be applicable to this consolidated lease which embraces the following described lands:

Salt Lake Meridian, Utah
T. 16 S., R. 7 E.,
Sec. 28, W $\frac{1}{2}$ SW $\frac{1}{4}$; ✓
Sec. 29, E $\frac{1}{2}$ SE $\frac{1}{4}$; ✓
Sec. 33, W $\frac{1}{2}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$ ✓

Containing 280.00 acres.

IN WITNESS WHEREOF:

Malcolm N. McKinnon
(Witnesses to signature of Lessee)

THE UNITED STATES OF AMERICA
By Ed. U. Cox
(Signing Officer)
Ed. U. Cox, Chief
Branch of Realty Services

October 18, 1973

(Date)

Malcolm N. McKinnon
(Signature of Lessee)

APPENDIX B

SPECIAL STIPULATIONS

Federal Regulations 43 CFR 3400 pertaining to Coal Management make provisions for the Surface Management Agency, the surface of which is under the jurisdiction of any Federal agency other than the Department of Interior, to consent to leasing and to prescribe conditions to insure the use and protection of the lands. All or part of this lease contain lands the surface of which are managed by the United States Department of Agriculture, Forest Service - Manti-LaSal National Forest.

The following stipulations pertain to the Lessee responsibility for mining operations on the lease area and on adjacent areas as may be specifically designated on National Forest System lands.

Forest Service Stipulation #1.

Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the Lessee may be required to conduct a cultural resource inventory and a paleontological appraisal of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists or qualified paleontologists, as appropriate, and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural or paleontological resources.

If cultural resources or paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the Lessee prior to disturbance shall immediately bring them to the attention of the appropriate authority. Paleontological remains of significant scientific interest do not include leaves, ferns or dinosaur tracks commonly encountered during underground mining operations.

The cost of conducting the inventory, preparing reports, and carrying out mitigating measures shall be borne by the Lessee.

Forest Service Stipulation #2.

If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory bird species of high Federal interest occur in the area, the Lessee shall be required to conduct an intensive field inventory of the area to be disturbed and/or impacted. The inventory shall be conducted by a qualified specialist and a report of findings will be prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The cost of conducting the inventory, preparing reports and carrying out mitigating measures shall be borne by the Lessee.

Forest Service Stipulation #3.

The Lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

Forest Service Stipulation #4.

Powerlines used in conjunction with the mining of coal from this lease shall be constructed so as to provide adequate protection for raptors and other large birds. When feasible, powerlines will be located at least 100 yards from public roads.

Forest Service Stipulation #5.

The limited area available for mine facilities at the coal outcrop, steep topography, adverse winter weather, and physical limitations on the size and design of the access road, are factors which will determine the ultimate size of the surface area utilized for the mine. A site specific environmental analysis will be prepared for each new mine site development and for major improvements to existing developments to examine alternatives and mitigate conflicts.

Forest Service Stipulation #6.

The Lessee shall be required to establish a monitoring system to locate, measure and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data.

Forest Service Stipulation #7.

The Lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal handling and storage facilities. On Forest Development Roads (FDR), Lessees may perform their share of road maintenance by a commensurate share agreement if a significant degree of traffic is generated that is not related to their activities.

Forest Service Stipulation #8.

Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, and (3) damage or alter the flow of perennial streams. The Lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created.

Forest Service Stipulation #9.

In order to avoid surface disturbance on steep canyon slopes and to preclude the need for surface access, all surface breakouts for ventilation tunnels shall be constructed from inside the mine, except at specific approved locations.

Forest Service Stipulation #10.

The coal contained within, and authorized for mining under this lease shall be extracted only by underground mining methods.

Forest Service Stipulation #11.

In order to protect big game wintering areas, elk calving and deer fawning areas, sagegrouse strutting areas, and other critical wildlife habitat and/or activities, specific surface uses outside the mine development area may be curtailed during specified periods of the year.

Forest Service Stipulation #12.

Support facilities, structures, equipment, and similar developments will be removed from the lease area within two years after the final termination of use of such facilities. Disturbed areas and those areas previously occupied by such facilities will be stabilized and rehabilitated, drainages re-established, and the areas returned to a premining land use.

Forest Service Stipulation #13.

The Lessee, at the conclusion of the mining operation, or at other times as surface disturbance related to mining may occur, will replace all damaged, disturbed or displaced corner monuments (section corners, 1/4 corners, etc.) their accessories and appendages (witness trees, bearing trees, etc.) or restore them to their original condition and location, or at other locations that meet the requirements of the rectangular surveying system. This work shall be conducted at the expense of the Lessee, by a professional land surveyor registered in the State of Utah, and to the standards and guidelines found in the Manual of Surveying Instructions, United States Department of the Interior.

Forest Service Stipulation #14.

The Lessees, at their expense, will be responsible to replace any surface water identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses.

STIPULATION FOR LANDS OF THE NATIONAL FOREST SYSTEM
UNDER JURISDICTION OF
DEPARTMENT OF AGRICULTURE

The licensee/permittee/lessee must comply with all the rules and regulations of the Secretary of Agriculture set forth at Title 36, Chapter II, of the Code of Federal Regulations governing the use and management of the National Forest System (NFS) when not inconsistent with the rights granted by the Secretary of the Interior in the license/prospecting permit/lease. The Secretary of Agriculture's rules and regulations must be complied with for (1) all use and occupancy of the NFS prior to approval of a permit/operation plan by the Secretary of the Interior, (2) uses of all existing improvements, such as Forest development roads, within and outside the area licensed, permitted or leased by the Secretary of the Interior, and (3) use and occupancy of the NFS not authorized by a permit/operating plan approved by the Secretary of the Interior.

All matters related to this stipulation are to be addressed

to Forest Supervisor
Manti-LaSal National Forest
599 West Price River Drive
Price, Utah 59801

Telephone No.: (801) 637-2817

who is the authorized representative of the Secretary of Agriculture.

Signature of Licensee/Permittee/Lessee

APPENDIX C

United States
Department of
Agriculture

Forest
Service

Price Ranger District
Manti-LaSal N.F.

Reply to: 2820 Leases and Permits

Date: August 20, 1986

Subject: Request for Preliminary I.D. Team Meeting,
Eight Proposed Coal Lease Readjustments, Price District

To: Forest Supervisor

The Price District has initiated the process to environmentally assess eight Federal coal leases that will soon be due for readjustment of terms (see attached list). The Forest's E.A. with stipulations are due in the R.O. during the next twelve months.

I am proposing a single preliminary I.D. Team meeting to identify the need, if appropriate, for a field review and/or additional meetings and, any new major issues and concerns. The following S.O. personnel are requested to attend the proposed meeting to be held on 9/3/86 at 0800 in the Conference Room:

Jim Jensen	Visual Resources
Dennis Kelly	Hydrology
Brent Barney	Engineering
Dan Larsen	Soils
Bob Thompson	T. & E.
Lee Foster	Environmental Coordinator
Carter Reed	S.O. Coordinator

The following D-3 personnel will also be in attendance:

Ira Hatch	District Ranger
Leland Matheson	Range/Wildlife
Gary Say	Timber/Recreation
Jo Ellis	Co-team Leaders
Walt Nowak	

Arrangements will be made to meet with any individuals that cannot attend the meeting as scheduled.

/s/ Ira W. Hatch

IRA W. HATCH
District Ranger

cc: I. D. Team Members

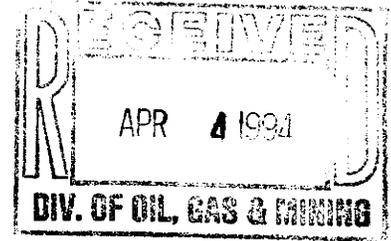
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Serial No.	Lessee	Lease Readjustment Due Date	Forest Notified By RO	EA & Stips Due in RO
U-46484	Northwest Carbon	05/01/88	5/16/86	08/01/87
U-024316	C.O.P. Coal	05/01/88	5/16/86	08/01/87
U-020668	Nevada Electric	05/01/88	5/16/86	08/01/87
U-024317	Utah Power & Light	05/01/88	5/16/86	08/01/87
U-38727	Nevada Electric	05/01/88	6/16/86	08/01/87
SL-050862	W.A. Land Co	08/05/87	04/07/86	01/05/87
U-2810	Smith-Holladay	10/01/87	10/17/85	02/01/87
U-022918	C.W. & J.O. Kingston	04/01/88	03/24/86	07/01/87

DECISION NOTICE
AND
FINDING OF NO SIGNIFICANT IMPACT

FOR THE READJUSTMENT OF
FEDERAL COAL LEASE U-7653

PRICE RANGER DISTRICT
MANTI-LA SAL NATIONAL FOREST
EMERY COUNTY, UTAH



On September 9, 1988, the Bureau of Land Management (BLM) notified the Forest Service that Federal Coal Lease U-7653 is subject to a readjustment of terms and conditions on September 1, 1990. This notification required the Forest Service to conduct an environmental analysis of the proposed action pursuant to the National Environmental Policy Act of 1969. A Forest Service interdisciplinary team met on December 6, 1989, to evaluate the proposal. An Environmental Assessment (EA) was prepared under the direction of the Manti-La Sal National Forest Supervisor.

Coal Leasing and development are done under the authority of the following actions: the Mineral Leasing Act of 1920, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; the Surface Mining Control and Reclamation Act (SMCRA) of 1977; the Multiple Minerals Development Act of 1977; the National Environmental Policy Act (NEPA) of 1969; the Federal Coal Leasing Amendments Act of 1976, as amended; regulations: Title 43 CFR Group 3400, Group 2800 and Title 30 CFR Group 700; and the Manti-La Sal National Forest Land and Resource Management Plan and Final Environmental Impact Statement, 1986 (Forest Plan).

It is my decision to consent to a readjustment of the terms and conditions of Federal Coal Lease U-7653, based on the analysis, authorizing actions, and evaluation described in the EA. This alternative (Alternative A as described in the EA) is a viable alternative under existing legislation and Forest Service policy, management decisions, and direction and includes the incorporation of the Forest Service stipulations contained in Appendix B of the Forest Plan. The No Action Alternative (Alternative B) was evaluated and determined not to be viable as it would allow continuation of the lease under terms inconsistent with the Manti-La Sal National Forest Land and Resource Management Plan and Final Environmental Impact Statement approved in November of 1986. Copies of the Environmental Assessment and other pertinent documents contained in the coal lease file are available for review at the Price Ranger District and Forest Supervisor's Offices in Price, Utah.

This is not a major Federal action that would significantly affect the quality of the human environment; therefore, an environmental impact statement is not

needed. This determination was based on consideration of a number of factors that are discussed in detail in the EA. The primary considerations are as follows:

1. No surface-disturbing operations or facilities are proposed. If surface-disturbing operations or facilities are proposed in the future, a site-specific environmental analysis will be prepared at that time. Additional stipulations may be specified as needed to protect the environment.
2. The identified impacts can be effectively mitigated to an acceptable level.
3. No known prime or unique farmlands, wetlands, timber lands, or rangelands; floodplains; alluvial valley floors; paleontological or cultural resources; nor Threatened, Endangered, or Sensitive floral or faunal species will be impacted by readjustment of this lease.
4. Readjustment of this lease is consistent with the directions and decisions of the Manti-La Sal National Forest Land and Resource Management Plan and FEIS.

Based on the environmental assessment, Federal Coal Lease U-7653 should be readjusted by the Bureau of Land Management to include the stipulations listed in the EA.

This lease is not presently included in an approved mining and reclamation plan (MRP), therefore, a determination of consistency between Forest Service special lease stipulations and a MRP cannot be made. If in the future this lease is proposed for inclusion into a MRP, the Forest Service will, at that time, make an evaluation to determine if the special lease stipulations are consistent with the MRP.

This decision is subject to appeal pursuant to 36 CFR 217. A written notice of appeal must be filed with the Chief, Forest Service, United States Department of Agriculture, P.O. Box 2417, Washington D.C. 20013, with a simultaneous copy to the Deciding Officer at the address below, within 45 days of the date of this decision, and containing specific information as required by 36 CFR 217.9.

J
E.R. Browning

J.S. Tixier
Regional Forester
Federal Building
324 25th Street
Ogden, Utah 84401

1-29-90

Date

ENVIRONMENTAL ASSESSMENT
FOR THE READJUSTMENT OF
FEDERAL COAL LEASE U-7653

PRICE RANGER DISTRICT
MANTI-LA SAL NATIONAL FOREST
EMERY COUNTY, UTAH

Responsible Official: J.S. Tixier
Regional Forester
Intermountain Region (R-4)
USDA - Forest Service
Federal Building
324 25th Street
Ogden, Utah 84401

For Further Information Contact: George Morris
Forest Supervisor
Manti-La Sal National Forest
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Price, Utah 84501

or: Ira W. Hatch
District Ranger
Price Ranger District
599 West Price River Dr.
Price, Utah 84501

ENVIRONMENTAL ASSESSMENT
FOR THE READJUSTMENT OF
FEDERAL COAL LEASE U-7653

I. PURPOSE OF AND NEED FOR ACTION

A. INTRODUCTION

The Bureau of Land Management (BLM) notified the Forest Service on September 9, 1988, that Federal Coal Lease U-7653, currently leased to Utah Power and Light Company, is subject to a readjustment of terms and conditions on September 1, 1990. Department of Interior Regulation 43 CFR 3451.1(a)(1) requires that all leases issued prior to August 4, 1976, be subject to readjustment at the end of the first 20-year period (under which this lease qualifies) and at the end of each 10-year period thereafter.

Federal Coal Lease U-7653 was originally leased to Carroll County Coal Company on September 1, 1970. A sublease to Peabody Coal Company was approved on January 1, 1974. The Malcolm N. McKinnon Marital Trust and the Malcolm N. McKinnon Estate Residual Trust became the lessee of record on June 24, 1980. In 1983, Federal Coal Lease U-7653 was subleased to W.A. Land Company. The lease is now held by Utah Power and Light Company.

Federal Coal Lease U-7653 is located in Emery County, Utah, within the Price Ranger District of the Manti-La Sal National Forest. It is located on East Mountain between Meetinghouse Canyon and the Left Fork of Rilda Canyon approximately 12 miles northwest of Huntington (Maps 1 and 2). The lease contains 411.6 acres with Federal surface and mineral rights. The lease is legally described as follows:

Township 16 South, Range 7 East, Section 31, All
Salt Lake Meridian, Utah

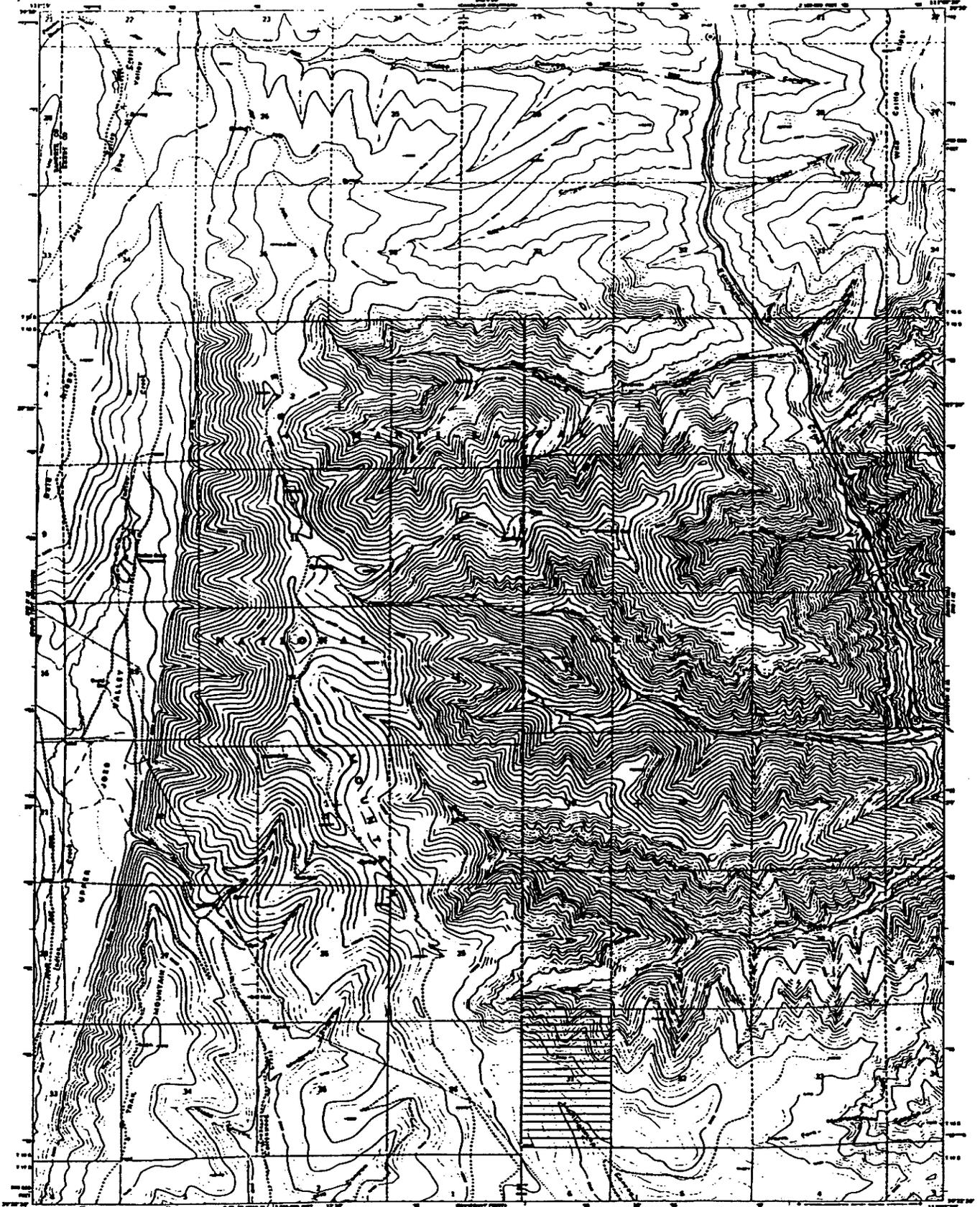
As the surface management agency for the lease area, the Manti-La Sal National Forest is responsible for conducting an environmental analysis of the proposed action pursuant to the National Environmental Policy Act (NEPA) of 1969. This EA addresses issues resulting from the readjustment and identifies mitigations for resource protection of lands within Federal Coal Lease U-7653.

B. DECISION NEEDED

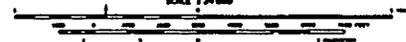
The Regional Forester of the Intermountain Region of the Forest Service is the official responsible for deciding if the Forest Service consents to readjustment of the terms and conditions for Federal Coal Lease U-7653 and under what Forest Service special lease stipulations.

C. ISSUES

General public comments were solicited through local newspapers on December 5, 1989. Specific comments were solicited by letter directly to interested individuals or organizations (refer to the listing in Chapter VII). The Utah Division of Wildlife Resources (DWR) and the lessee, Utah Power and Light Company, responded. In general, the DWR is concerned about the



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and the U.S. Forest Service
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Government work and, as such, is in the public domain in the United States of America.
This map is published under the authority of the Secretary of the Interior of the United States of America.



SCALE 1:24,000
CONVERSION TABLE, IN FEET
UTAH GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

THIS MAP WAS PREPARED FROM AERIAL PHOTOGRAPHS
AND DATA BY U.S. GEOLOGICAL SURVEY, BUREAU OF LAND MANAGEMENT, AND U.S. FOREST SERVICE
A FEDERAL COAL LEASING ACTIVITY AND IS AVAILABLE TO THE PUBLIC

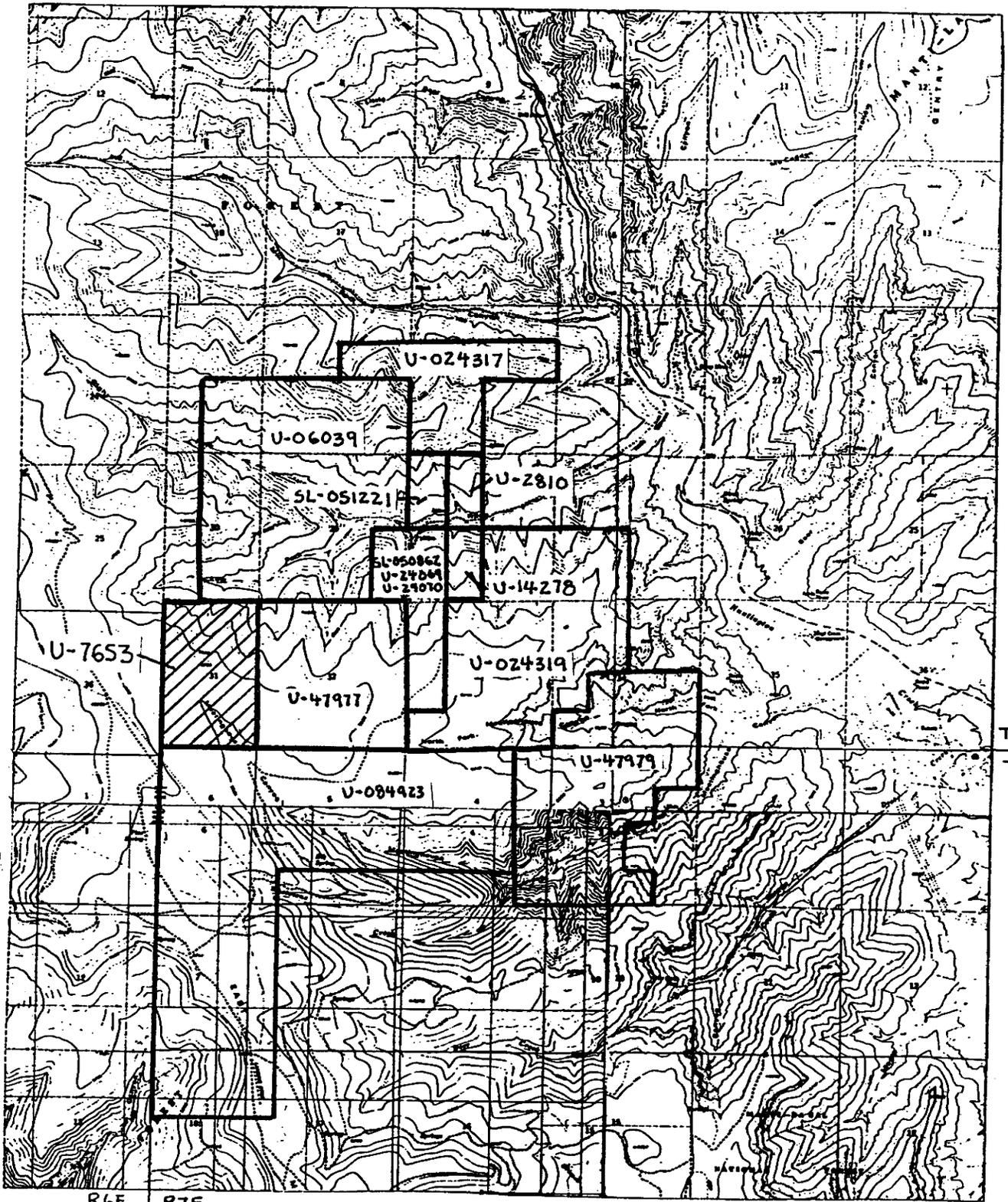


ROAD CLASSIFICATION
Primary Highway: Light-gray line, solid or
dashed surface
Secondary Highway: Dashed line, solid or
dashed surface
Unimproved Road: Dotted line, solid or
dashed surface
Intermittent Road: Dotted line, solid or
dashed surface

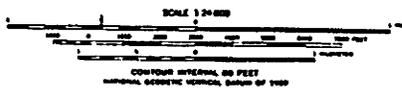
REIDA CANYON, UTAH
7.5 MINUTE SERIES (TOPOGRAPHIC)
1975
UTAH GEOLOGICAL SURVEY

 Federal Coal
Lease U-7653

Map 1



Mapped, edited, and published by the Geological Survey
 Control by USGS, HDS/DMNA, and U.S. Forest Service
 Topographic photographs available from aerial photographs
 taken 1970. Field checked 1970. Map dated 1970
 Projection and 80,000-foot grid. Unit
 coordinate system, based on Standard Meridian datum
 1983. National Transverse Mercator grid. Zone
 12, shown in blue. 1927 North American datum.
 Plus and minus lines indicate standard lines.
 There may be some variations within the boundaries of the
 Federal Coal Lease areas shown on this map.



THIS MAP COPIES WITH ORIGINAL, NOT REPRODUCED
 FOR SALE BY U.S. GEOLOGICAL SURVEY, BUREAU OF LAND MANAGEMENT, 2500
 A FURTHER COPIES INFORMATION, MAPS AND DATA IS AVAILABLE ON REQUEST



ROAD CLASSIFICATION

Primary Highway	Light-duty road, hard or
Local Road	improved surface
Secondary Highway	Unimproved road
Foot Path	U.S. Road () State Road
Interstate Road	

 Federal Coal Lease U-7653

Map 2

potential effects of subsidence and mining-induced escarpment failures on wildlife habitat. Utah Power and Light Company objected to Forest Service special lease stipulations being included in the lease. These issues have been considered in the EA. The response letters have been retained in the Forest Service project file and are available for review. The Forest Service Interdisciplinary Team met on December 6, 1989.

The following issues were identified:

1. Surface-disturbing activities could adversely affect area resources.
2. Subsidence caused by underground mining could adversely affect surface and ground water, soils, vegetation, and wildlife.

D. AUTHORIZING ACTIONS AND PERMITS

Coal leasing and development are done under the authority of the following actions: the Mineral Leasing Act of 1920, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; the Surface Mining Control and Reclamation Act (SMCRA) of 1977; the Multiple Minerals Development Act of August 4, 1977; the Federal Coal Leasing Amendments Act of 1976, as amended; regulations: Title 43 CFR Group 3400 and Group 2800, and Title 30 CFR Group 700; and the Manti-La Sal National Forest Land and Resource Management Plan (Forest Plan) and Final Environmental Impact Statement (FEIS), 1986.

Utah Power and Light Company would probably access Federal Coal Lease U-7653 through the Deer Creek Mine. This mine has been permitted and authorized under an approved mining and reclamation plan. The company is employing room-and-pillar development mining to set up longwall panels, and future development and production will probably be accomplished using the same techniques. The lease would have to be incorporated into the mining and reclamation plan before any mining of the tract could begin.

II. ALTERNATIVES

A. READJUSTMENT OF TERMS ALTERNATIVE

Department of Interior Regulations 43 CFR 3400.3-1 pertaining to coal management make provision for the surface management agency to consent to leasing and to prescribe conditions to insure the use and protection of the land. The lands contained within this lease are managed by the United States Department of Agriculture, Forest Service, Manti-La Sal National Forest. Under this alternative, a readjustment of lease terms would include application of the Forest Service stipulations contained in Appendix B, pages B-2 through B-4 and B-8, of the Manti-La Sal National Forest Land and Resource Management Plan which are determined to be needed based on this site-specific environmental analysis. These stipulations would be included in the readjusted lease in lieu of existing special stipulations. These stipulations would mitigate the environmental impacts

of any future surface-disturbing activities or subsidence caused by underground mining. They are included in the appendix of this EA.

B. NO ACTION ALTERNATIVE

Consideration of the no action alternative is required by Section 1502.14(d) of NEPA and by the Council of Environmental Quality guidelines as specified in 43 CFR 1502.14(d). Under this alternative, the special lease stipulations of the lease would not be changed. The Special Stipulations and Standard Stipulation for Lands Under Jurisdiction of Department of Agriculture applied to the lease in 1970 would remain in effect.

C. COMPARISON OF ALTERNATIVES

If the Forest Service does not consent to readjustment of its terms and conditions for U-7653, the appropriate Forest Service special stipulations listed in the Manti-La Sal National Forest Land and Resource Management Plan would not be applied to the readjusted lease. The special lease stipulations originally applied to the lease would remain in effect. If mining were to occur on the lease, the 1970 stipulations would not provide the level of mitigation of impacts and protection of resources required in the Manti-La Sal National Forest Land and Resource Management Plan (FLRMP) and Final Environmental Impact Statement (FEIS), 1986 (FEIS pages IV-68 through IV-77 and III-52, FLRMP pages III-4, III-12, III-34 through III-35). The Forest Service preferred alternative is Alternative A (Readjustment of Terms Alternative).

III. AFFECTED ENVIRONMENT

A. GEOLOGY AND COAL

Federal Coal Lease U-7653 is located within the east-central portion of the Wasatch Plateau, which is considered to be a transition zone between the Basin and Range Physiographic Province to the west and the Colorado Plateau Province to the east (Stokes, 1986). The Wasatch Plateau is a north-trending feature formed by uplifted sedimentary rock of late Cretaceous-early Tertiary age.

Rock strata in the region represent deposition in diverse environments and consist of nearly horizontal beds of sandstone, shale and limestone which make up the following units (in ascending order): the Mancos Shale, Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation and Flagstaff Limestone. The Star Point Sandstone and Mancos Shale are not exposed on the subject lease, but are exposed in the lower part of Rilda Canyon. The Flagstaff Limestone overlies the North Horn Formation south and west of the lease (Witkind, et al., 1978).

Two coal seams are considered to be mineable within the lease (the Hiawatha and Blind Canyon seams), and both are located in the lower part of the Blackhawk Formation. The Hiawatha Seam is the lower of the two seams, and

it is situated at or near the contact of the Blackhawk Formation and the Star Point Sandstone (Doelling, 1972). Overburden on the lease ranges from 1000 to nearly 2,000 feet. The contained coal has not been mined and is ranked as a high volatile A-3 bituminous coal having average characteristics as shown in Table 1.

Table 1

Average characteristics of coal in the Section 31 vicinity
(from Doelling, 1972)

Moisture	5.0%
Volatile Matter	42.2%
Fixed Carbon	45.5%
Ash	7.3%
Sulfur	0.5%
Energy Content	13,900 BTU/LB

Coal of this grade is suitable for steam or metallurgical purposes.

B. SOILS

Soils consist of sandy, silty clay to clay in relation to parent materials and vary in depth from zero to several feet. Soils are generally unstable when saturated as evidenced by micro-contouring, small slumps and geotropism of vegetation. The shale in the North Horn Formation weathers to a fine clay that is very unstable when wet.

The soils can be grouped on the basis of those found on north-facing slopes and those found on south-facing slopes. The south-facing slopes are generally 20 degrees warmer, and about half are composed of rock outcrop and shallow soil less than 20 inches deep. Soils are between 20 and 40 inches deep on the other half of the south-facing slopes. The soil is light colored, which is indicative of little organic matter present. The soils on the north-facing slopes have formed from sandstone and shale colluvium and are usually deeper than 40 inches. Textures range from cobbly loam to clay loam.

Erosion has been extensive and is occurring at an appreciable rate. The reclamation potential where soils are shallow is low.

C. HYDROLOGY

Federal Coal Lease U-7653 is located across the divide separating the Main Fork of Meetinghouse Canyon and Rilda Canyon and is entirely within the watershed of Huntington Creek. Downstream water uses include: municipal, industrial, fisheries, recreation, range and wildlife. Huntington Creek is sometimes used as a municipal and irrigation water supply for the City of Huntington. These uses are identified in beneficial use standards for the State of Utah and in the Manti-La Sal National Forest Land and Resource

Management Plan (III-4). Ground water and surface water within the lease and adjacent areas are generally of good quality. Water usage of each of the creeks is described as follows:

1. Main Fork of Meetinghouse Creek

The Main Fork of Meetinghouse Creek watershed originates in the lease area. This creek is ephemeral.

2. Rilda Creek

Rilda Creek is a perennial creek fed by springs, snowmelt and storms. Federal Coal Lease U-7653 covers part of its watershed. Three springs located near the end of the road in Rilda Canyon are used by the North Emery Waters Users Association for culinary water. Two of the springs are surface springs from colluvium and one originates from the Star Point Sandstone. In addition to supplying culinary water, Rilda Creek supports riparian vegetation.

The surface hydrology and spring locations are known and are described in the hydrologic section of the Deer Creek Mining and Reclamation Plan. Utah Power and Light Company is conducting hydrologic monitoring in the lease area. The Forest Service has inventoried and filed claims on all of the water sources considered significant to the operation and management of the National Forest. The locations of these water sources can be found in the water use inventory and in the water claims presented to the court during the adjudication of the San Rafael River.

D. WILDLIFE

The lease area provides seasonal or yearlong habitat for a wide variety of species. Management Indicator Species that utilize the area include: blue grouse, mule deer, elk, and golden eagles. Other species of interest include: black bear, moose, cougar, coyote, and bobcat. Numerous species of small and non-game birds and animals are found in the area.

Because of the steep, rugged topography the area serves as a refuge for many of the hunted species such as black bear, cougar, elk and mule deer. It also provides security habitat where fawning and calving take place.

The area drains into both the Main Fork of Meetinghouse and Rilda Canyons. While these canyons as a whole support only limited fisheries, the mouths of these drainages are used as spawning and rearing habitat for Cutthroat trout. This is important habitat for the valuable fishery contained in the main Huntington Creek. A detailed description of wildlife in the area is contained in Utah Power and Light Company's Mining and Reclamation Plan for the Deer Creek Mine.

E. VEGETATION

Rilda Canyon and the Main Fork of Meetinghouse Canyon are rugged mountainous tributaries to Huntington Canyon. Habitat types within this

area vary with elevation, exposure, slope and aspect. The predominant habitat type in the lease area is *Picea engelmanni/Ribes montigenum*. The spruce/fir habitat type is invading aspen communities throughout the area. Windblown ridge tops and dry hillsides are common in the tract. A bunchgrass association of native wildryes and wheatgrasses occupy these slopes. Mountain brush communities occur in the dryest rocky areas and sagebrush occurs on dry sites with deeper soils. Small canyon bottoms have bluegrass and carex species. Some cottonwoods can be found in the lower reaches of these small canyons. No Endangered, Threatened or Sensitive plant species are known to occur on the lease.

F. RANGE

Federal Coal Lease U-7653 is located in a designated range management area according to the Manti-La Sal National Forest Land and Resource Management Plan (Appendix F - Proposed Action Map). The land within this lease is covered by the East Mountain cattle and horse allotment. However, cattle use in the north part of the lease area is restricted by topography. There are no range improvements on the lease.

G. RECREATION AND LAND USE

There are no developed recreation sites in Meetinghouse or Rilda Canyons or on the lease tract. Vehicle access to U-7653 is through private surface lands which may restrict some users. Land uses include: grazing, hunting, coal exploration, and recreation. Survey markers are located at all corners of Section 31.

H. TOPOGRAPHY

The lease area is located on East Mountain between Rilda Canyon and the Main Fork of Meetinghouse Canyon. Elevations range from 8400 to 9800 feet. Slopes in the lease area vary from 50 percent or greater along the steep escarpments to nearly flat on top of the plateau.

IV. ENVIRONMENTAL CONSEQUENCES

A. READJUSTMENT OF TERMS ALTERNATIVE

Under this alternative, Federal Coal Lease U-7653 would be readjusted with Forest Service mitigations. The stipulations contained in the appendix of this Environmental Assessment would replace those applied to the lease in 1970 when it was originally issued. The stipulations are consistent with those listed in Appendix B of the FLRMP and language requested by the Interior Board of Land Appeals as the result of past lease readjustment appeals. The stipulations mitigate the anticipated effects to the maximum degree practical.

1. Short-term and Residual Impacts

There would be no effects to the environment unless coal is produced from the lease and/or surface-disturbing operations are conducted. Utah Power and Light Company would access the lease from their existing Deer Creek Mine, and there would probably be no surface facilities on the lease.

If the lease is mined, effects would result from deformation of the overburden and subsidence of the land surface. Subsidence begins almost immediately upon mining and may continue for many years after the working area is abandoned. The amount, rate and extent of subsidence depends upon the mining method, mine configuration, number and thickness of coal seams and a variety of geologic factors. Stresses produced within the rock strata as a result of mining may affect mine safety, coal recoverability, ground water flow, and surface resources.

It is expected that mining and subsidence would have an effect upon the topography and natural ground water flow of the lease which may, in turn, result in effects to surface water, soils, vegetation, wildlife habitat and land uses. Stipulations 3 and 7 require the Lessee to establish baseline data on surface resources and to monitor any impacts. Mining under escarpments can induce their failure, and Stipulation 9 is designed to mitigate this impact except at specific pre-approved locations. Pre-mining land uses are protected by Stipulation 13, which states that surface improvements must be protected, restored or replaced for the continuance of current land uses. Stipulation 15 mitigates any potential impacts to watersheds, and Stipulation 16 addresses the replacement of any survey markers damaged by mining. The springs in Rilda Canyon are used for municipal water and have been identified for protection. Stipulation 17 mitigates any impact to this water source.

Additional effects could result from any surface-disturbing activities such as coal exploration drilling. Surface-disturbing operations could result in degradation of surface water quality, increased soil erosion, removal of vegetation and the associated disturbance to wildlife from human activities and presence. However, a site-specific environmental analysis would be required before any approval of surface-disturbing activities. Stipulations 1, 2, 4, 5, 6, 8, 10, 11, 12, 14, and 15 are designed to mitigate the effects of surface-disturbing activities.

3. Short-term Use vs. Long-term Productivity

Underground mining and subsidence could involve long-term alteration of ground water flow and associated effects to surface resources. The long-term productivity could be altered as drainages, soils and vegetation gradually adjust to any modified ground water conditions. The productivity could decrease or increase depending on the amount of available water.

4. Irreversible and Irrecoverable Commitment of Resources

The resources that would be consumed in coal extraction would be irretrievable and would not be available for use elsewhere once expended. After the coal is mined, its use by future generations would be irreversibly lost, and the coal left in place would not be recoverable using present technology.

Subsidence could result in the irreversible commitment of some of the discussed resources, if impacts are not adequately mitigated.

5. Cumulative Effects

Historically, man's activities in the lease area have included livestock grazing, recreational use, coal exploration and associated roads which have resulted in changes in vegetation and erosion. There are no cumulative effects associated with the readjustment of this lease. Cumulative effects resulting from mining coal in this lease and adjacent leases could include the effects from subsidence, the effects associated with surface disturbing operations such as some coal exploration, and the human activity from continued operations.

B. NO ACTION ALTERNATIVE

Under the terms and conditions contained in the existing lease, the environmental consequences would not be as thoroughly mitigated as under Alternative A (Readjustment of Terms Alternative).

V. LIST OF PREPARERS

Bill Broadbear, Price District Forester	Team Member
Becky Hammond, Price District Geologist	Team Leader
Ira W. Hatch, Price District Ranger	Team Member
John Healy, Ferron District Range Conserv.	Consultant
Dennis Kelly, SO Hydrologist	Team Member
Dan Larsen, SO Soil Scientist	Team Member
Leland Matheson, Price District Range Conserv.	Team Member
Walt Nowak, Price District Geologist	Team Member
Rod Player, SO Wildlife Biologist	Team Member

VII. LIST OF AGENCIES AND PERSONS CONSULTED

1. Carroll County Coal, 2000 Union Commerce Bldg., Cleveland, OH 44114
2. East Carbon Wildlife Federation, 331 Carson, Box 904, East Carbon, UT 84520
3. Emery County Commissioners, 75 East Main, Castle Dale, UT 84513
4. Huntington Livestock Association, P.O. Box 1183, Huntington, UT 84528
5. Slickrock Country Council, P.O. Box 126, Moab, UT 84532
6. Slickrock Outdoor Society, Rt. 1, Box 144-H, Price, UT 84501
7. Southeastern Utah Association of Local Governments, 145 West 3450 South, Price, UT 84501
8. Utah Division of Wildlife Resources, 455 West Railroad Ave., Price, UT 84501
9. Utah Power and Light Company, 15 North Main, Huntington, UT 84528
10. Utah Wilderness Association, 455 East 400 South #306, Salt Lake City, UT 84111

VIII. REFERENCES

- Environmental Assessment for the Readjustment of Federal Coal Lease U-024319, Price Ranger District, Manti-La Sal National Forest Emery County, Utah (8/89).
- Environmental Assessment for the Readjustment of Federal Coal Lease U-2810 (1/87).
- Environmental Assessment for the Readjustment of Consolidated Federal Coal Lease SL-050862/U-24069/U-24070, Price Ranger District, Manti-La Sal National Forest, Emery County, Utah (12/86).
- Manti-La Sal National Forest Land and Resource Management Plan and Final Environmental Impact Statement (11/86).
- Environmental Assessment/Technical Analysis, Utah Power and Light Company Deer Creek Mine (8/85).
- Utah Power and Light Company Deer Creek Mining and Reclamation Plan (8/85).
- Environmental Assessment Proposed Coal Lease Tract Section 32, T. 16 S., R. 7 E., SLM, U-47977, Emery County, Utah (10/80).
- Doelling, H.H., 1972, Central Utah Coal Fields: Sevier-Sanpete, Wasatch Plateau, Book Cliffs and Emery: Utah Geological and Mineral Survey Monograph Series No. 3.
- Stokes, W.L., 1986, Geology of Utah: Occasional Paper No. 6 of the Utah Museum of Natural History, 280 p.
- Witkind, I.J., Likde, D.J., and McBroom, L.A., 1978, Preliminary geologic map of the Price 1 degree x 2 degree Quadrangle, Utah: United States Geological Survey, Open File Report 78-465.

ENVIRONMENTAL ANALYSIS REPORT/PART 23 TECHNICAL EXAMINATION

PEABODY COAL COMPANY

FEDERAL LEASES U-06039, SL-051221, AND U-014275

LEASE READJUSTMENT

Prepared by:	Jim Anderson	Hydrologist
	Dan Grundvig	Geologist
	Barry Johnson	Forester
	Dale Rapin	Soil Scientist
	John Rector	Hydrologist
	Rogers Thomas	Forester, Team Leader
	Fred Thompson	Geologist

Approval of Report
Recommended by:

John McLaughlin
District Ranger D-2

Date 10-1-76

Law W. White
District Ranger D-3

Date 10-1-76

Report
Approved by:

Reed C. Christensen
Forest Supervisor

Date 10/4/76

NEGATIVE DECLARATION

ENVIRONMENTAL ANALYSIS REPORT

Ferron Ranger District
Price Ranger District

Manti-LaSal National Forest

The proposed activity is not considered to be a major Federal action significantly affecting the quality of the human environment (requiring an environmental statement pursuant to Section 102 (2) (C) of the National Environmental Policy Act of 1969 (PL-91-190) or to be highly controversial. Those actions that could adversely affect the quality of the physical and biological components in the project area will be sufficiently minimized to prevent long-term environmental impacts. Overall social and economical effects of the proposal are considered to be beneficial. Consultation with others on the proposed project did not reveal significant adverse reaction. These determinations are based upon evaluations made in the attached Environmental Analysis Report.


REED C. CHRISTENSEN
Forest Supervisor

Enclosure

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I. Introduction

Peabody Coal Company of St. Louis, Missouri, presently controls Federal Coal Leases No.'s U06039, SL051221, and U014275 (Figure 1).

These leases are in the status for readjustment of lease terms. By law (41 Stat. 437 as amended) "the Government expressly reserves the right, reasonably to readjust and fix royalties payable hereunder and other terms and conditions at the end of 20 years from the date hereof and thereafter at the end of each succeeding 20-year period during the continuance of this lease, unless otherwise provided by law at the time of the expiration of any such period."

Therefore the proposed action being assessed in this report is the 20-year readjustment of terms and conditions of these leases.

Part 23 of CFR 43, titled Surface Exploration, Mining and Reclamation of lands, and the National Environmental Policy Act of 1969 require the Government to prepare a technical examination and environmental analysis, respectively, to assess possible impacts the proposed action may have on the environment and resource values. Accordingly, the format of this report will be such that the requirements of each statute will be embodied in a single report.

This report has been prepared based upon studies, investigations, and review of available data through the interdisciplinary team approach.

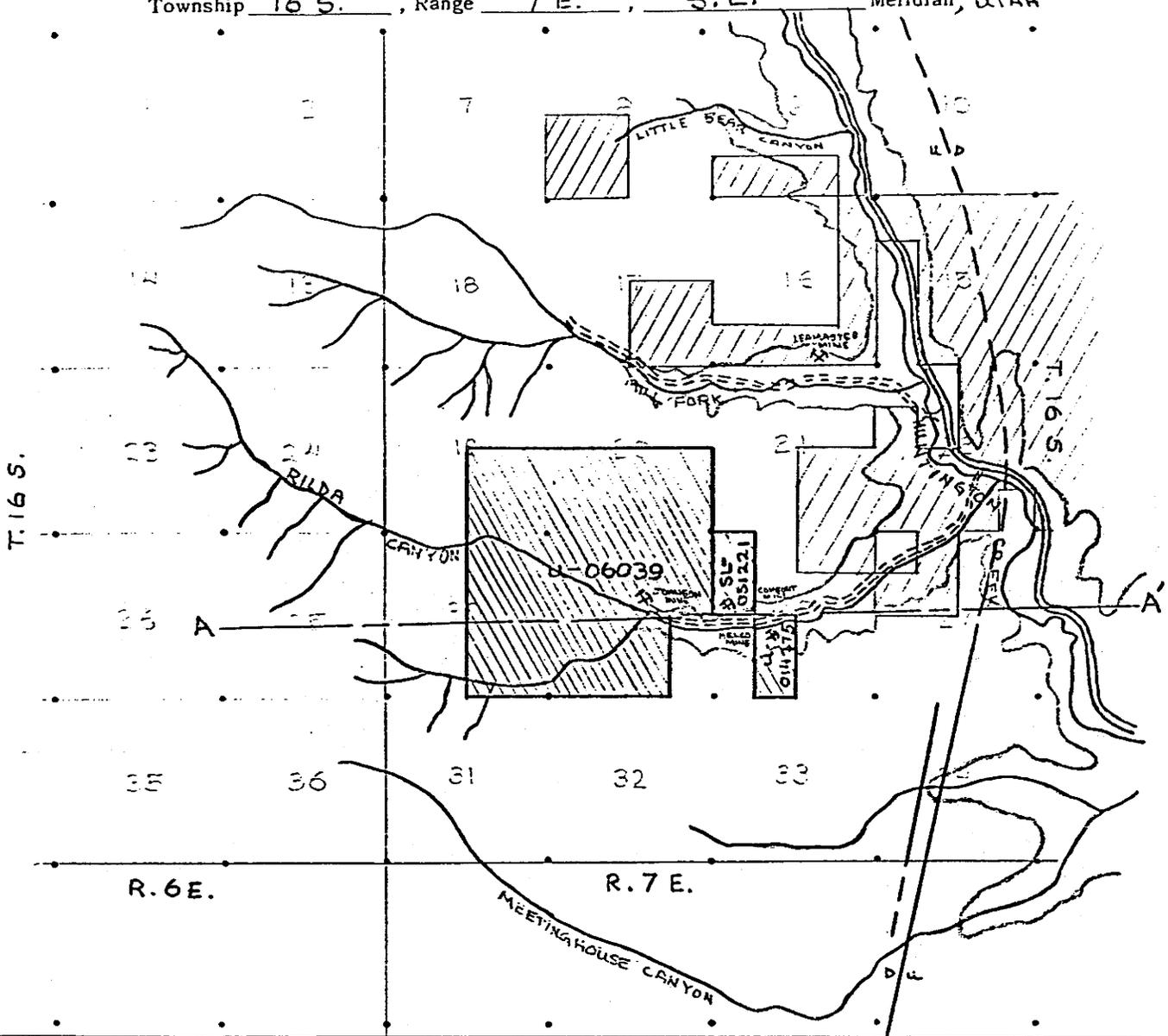
Mining activities on the lease areas are presently inactive. Should the lessee submit formal mining plans, the elements of this plan shall then be evaluated and an Environmental Analysis Report will be prepared for the project.

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 BUREAU OF LAND MANAGEMENT

Serial Number
 U 06039 / S1051221 / U14275

MAP

Township 16 S., Range 7 E., S.L. Meridian, UTAH



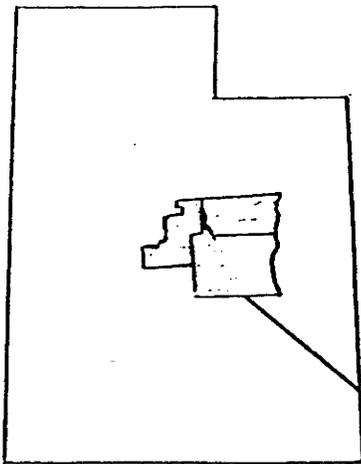
LAND OWNERSHIP KEY AND ADDITIONAL TOPOGRAPHIC SYMBOLS

Scale: 1" = 1 MILE

	COAL LEASE		
	NON-FEDERAL LAND		
	COAL OUTCROP (Approx.)		

OTHER DATA

LOCATION AND ACCESSIBILITY



KEY MAP

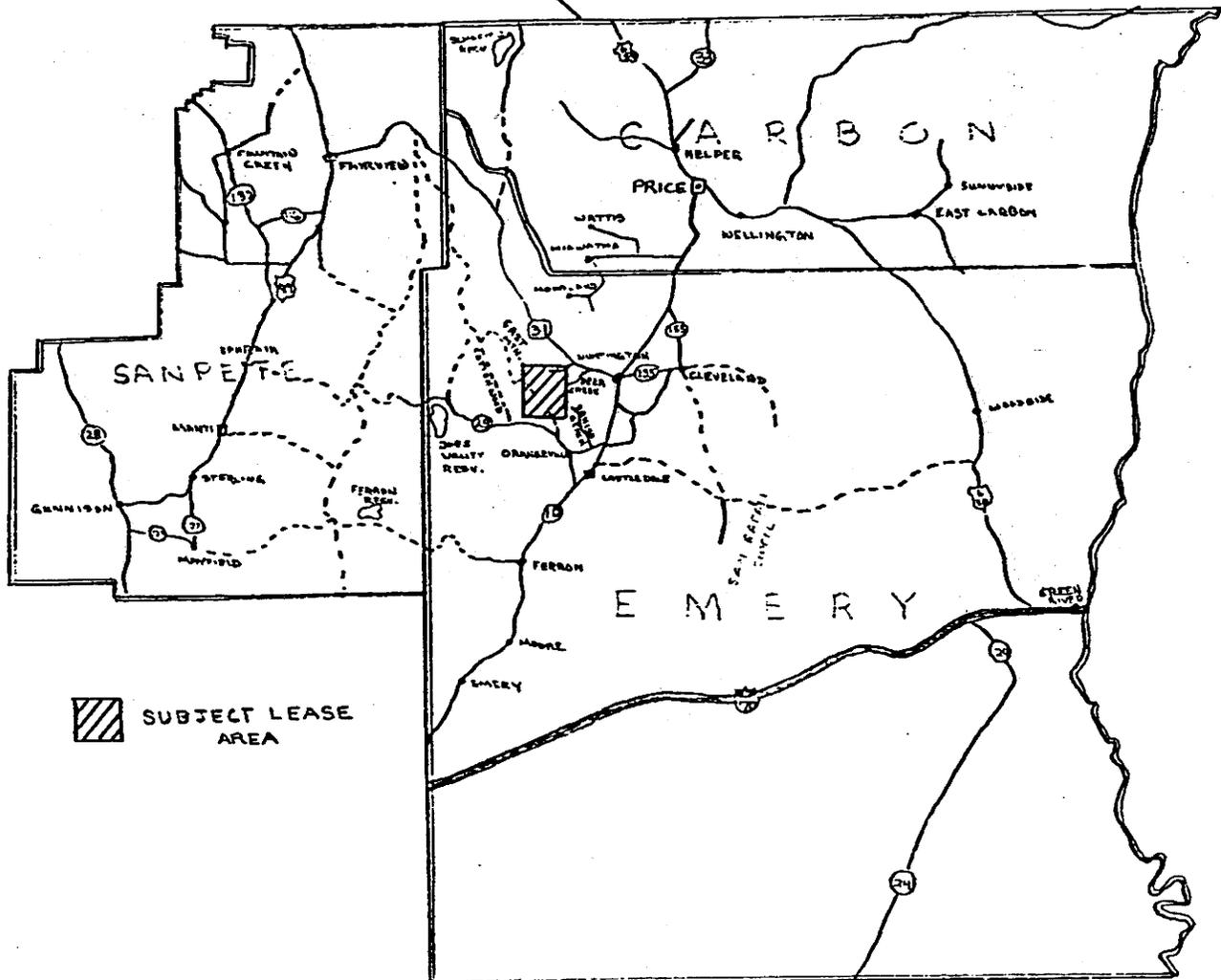


FIGURE 2

II. Background Information

1. Land Description

The subject lease areas are located in Emery County, Utah, within the Manti-LaSal National Forest. They lie in the Rilda Canyon drainage along the east-central rim of the Wasatch Plateau. The perimeters are located approximately 14 miles northwest of the community of Huntington, Utah.

Access to the eastern perimeters of the leases is provided by an asphalt-surfaced road through Huntington Canyon, Utah Highway 31, and an unimproved road through Rilda Canyon.

Leases U-06039, SL-051221, and U-014275 are legally described as follows:

<u>Lease</u>	<u>Location</u>
<u>U06039</u>	<u>T. 16 S., R. 7 E., S.L.M., Utah</u> SE $\frac{1}{4}$: Sec. 19 S $\frac{1}{2}$: Sec. 20 N $\frac{1}{2}$; SW $\frac{1}{4}$: Sec. 29 W $\frac{1}{2}$ SE $\frac{1}{4}$: Sec. 29 E $\frac{1}{2}$: Sec. 30 Total Acreage <u>1,360</u>
<u>SL051221</u>	<u>T. 16 S., R. 7 E., S.L.M., Utah</u> W $\frac{1}{2}$ NW $\frac{1}{4}$: Sec. 28 Total Acreage <u>80</u>
<u>U014275</u>	<u>T. 16 S., R. 7 E., S.L.M., Utah</u> E $\frac{1}{2}$ SW $\frac{1}{4}$: Sec. 28 Total Acreage <u>80</u>

All acreage within the lease areas is National Forest land.

2. History

The discovery of coal within Emery County was first reported by the Corps of Topographical Engineers in 1853. After this initial investigation, serious efforts to exploit this resource were hampered by Indian interference for over 20 years. In 1875 a mine was opened in Meetinghouse Canyon, at the site of the present Huntington Mine, by the Fairview Coal and Coke Company. Other enterprises soon followed and since these early beginnings, coal mining has grown to be a major industry of Emery County.

Lease SL-051221, currently held by Peabody Coal Company, is located on the W $\frac{1}{2}$ NW $\frac{1}{4}$ of Sec. 28, T. 16 S., R. 7 E., SIM, Emery County, Utah, and consists of 80 acres.

The above acreage was initially leased to Rulon W. Jeppson on November 5, 1934. The lease then changed hands a number of times as follows:

<u>From</u>	<u>To</u>	<u>Date</u>
Rulon W. Jeppson	Comfort Coal Co.	March 1940
Comfort Coal Co.	William Smith	March 1944
William Smith	F. F. Hintze then to Utah Coking Coal, Inc.	December 1953
Utah Coking Coal, Incorporated	Rilda Corporation	August 1965
Rilda Corporation	Peabody Coal Company	July 1971

Lease U-014275, currently held by Peabody Coal Company, is located on the E $\frac{1}{2}$ SW $\frac{1}{4}$ Sec. 28, T. 16 S., R. 7 E., SIM, Emery County, Utah, and consists of 80 acres.

The above acreage was initially leased to John Helco on October 1, 1955. The lease was then assigned to Ura Swisher on July 1, 1967. It was then assigned to Peabody Coal Company on January 1, 1973.

Lease U-06039, also currently held by Peabody Coal Company, is located on SE $\frac{1}{4}$ Sec. 19, S $\frac{1}{2}$ Sec. 20, Sec. 29, and E $\frac{1}{2}$ Sec. 30, T. 16 S., R. 7 E., SIM, Emery County, Utah, and consists of 1,440 acres.

The above acreage was initially leased to Ferdinand F. Hintze on May 1, 1953. It changed hands a number of times. On December 7, 1953, it was assigned to Utah Coking Coal, Inc.; on August 4, 1965, it was assigned to Rilda Corporation; and finally it was assigned to Peabody Coal Company on February 1972.

A partial assignment of 80 acres of the above 1,440 acres to Malcolm N. McKinnon took place on November 1, 1973. The location of the 80 acres is in the E $\frac{1}{2}$ SE $\frac{1}{4}$, Sec. 29, T. 16 S., R. 7 E., SLM, Emery County, Utah. The description of the 80 acres is under U-24069.

3. Mine Development

There are presently no mining activities on the lease areas. The Smith Mines operated on lease SL-051221 from January 1935 to September 1950. The coal was mined from the Hiawatha seam, and produced about 46,300 tons of coal.

The Helco mine operated on lease U-014275 from April 1959 to April 1965. The coal was mined from the Hiawatha seam and produced about 5,600 tons of coal. Lease U-06039 has not been mined to date.

The same mineable coal seams are present on these leases that are present in surrounding mines. From information on the surrounding mines and from the lease areas, we can assume that the coal seam thickness is fairly consistent throughout the area, indicating the Hiawatha seam varies from 8 to 12 feet in thickness with a heating value of approximately 12,000 BTU's and a sulfur content of .5 percent. The Blind Canyon coal seam, which is about 90 feet higher stratigraphically, has a thickness of approximately 8 to 10 feet, with a heating value of about 13,000 BTU's and a sulfur content of .6 percent.

The mining supervisor has received no mining plans for any renewed operations on these lease areas. It can be assumed that these lease areas are being held in reserve by Peabody.

Multiple seam mining can be expected to occur over a large extent of the lease areas. This may require mining of the upper seam first and could involve four mining methods. These include conventional, continuous room and pillar, longwall and shortwall. It is anticipated that a combination of these methods will be used as mine conditions dictate.

Conventional and continuous room and pillar mining should be able to extract from 40 to 60 percent of the coal. With longwall and shortwall up to 70 percent of the coal can be mined.

As mentioned previously, there has been no active mining on these leases since 1965. These old mine workings are probably in unusable condition and new entries will be made. In adjacent mines, 5 to 7 parallel entries are driven from the surface in the coal seam.

No surface exploration plans for the lease areas have been received at present. However, to define the coal seams and mining conditions, it can be assumed that surface explorations will precede the mining and will continue for the life of the mine.

4. Forest Service Plans for Affected Areas

All of the leases are under Federal ownership and are administered by the Manti-LaSal National Forest, Price and Ferron Ranger Districts.

The Forest Service presently administers these lands for range forage, wildlife habitat, watershed, and some dispersed recreation.

Springs at the lower portion of lease U-06039 have been developed for culinary water source for north Emery County. (See full discussion in Section III, 19.)

The Forest Service plans to continue the maintenance and protection of these resources under the Multiple Use concept.

5. Adjoining Surface Land Uses

Lands immediately adjacent to these leases are also Forest Service administered. Surface uses were discussed in the previous section.

6. Present and Projected Demand for the Mineral Materials

Recent international incidents threatening the availability of foreign energy supplies has led to the establishment of goals leading to energy independence. These goals have led to the search for new energy sources and to the increased consumption of known energy resources.

Federal air quality regulations limiting sulfur dioxide (SO₂) emissions from coal-fired electrical generation plants has made low-sulfur western coal especially attractive.

Increased western coal production is anticipated as consumption of electrical energy increases and as domestic oil and gas reserves become unavailable.

Coal from these properties are held in reserve by Peabody. When these properties are developed, it is expected that the coal will go to fuel nearby power plants.

III. Description of the Existing Environment and Associated Impacts of the Proposed Action

1. Topography

The lease area lies along the eastern face of the Wasatch Plateau. The area is one of rugged mountainous terrain, mostly cuestas or steep cliffs and nearly flat, unbroken high-level surfaces. The eastern face of the plateau rises, in the form of a steep cliff-like slope with precipitous sandstone ledges and alternating shale slopes commonly covered by large sandstone talus. The slopes rise about 1,000 feet above the valley floor. Major creeks within the area flow southeasterly toward the Colorado River. Deep incised canyons have formed where these creeks emerge from the plateau. Altitudes range from 6,000 feet to nearly 10,000 feet above sea level.

The lease area (Figure 1) is divided almost equally by the Rilda Canyon drainage. The drainage is a tributary to Huntington Creek and is deeply incised into the surface, leaving the lease area steep and rugged. There is over 2,000 feet elevation difference from the bottom of the drainage to the top of the narrow ridges. The hillsides are steep, consisting of alternating sandstone ledges and shale slopes.

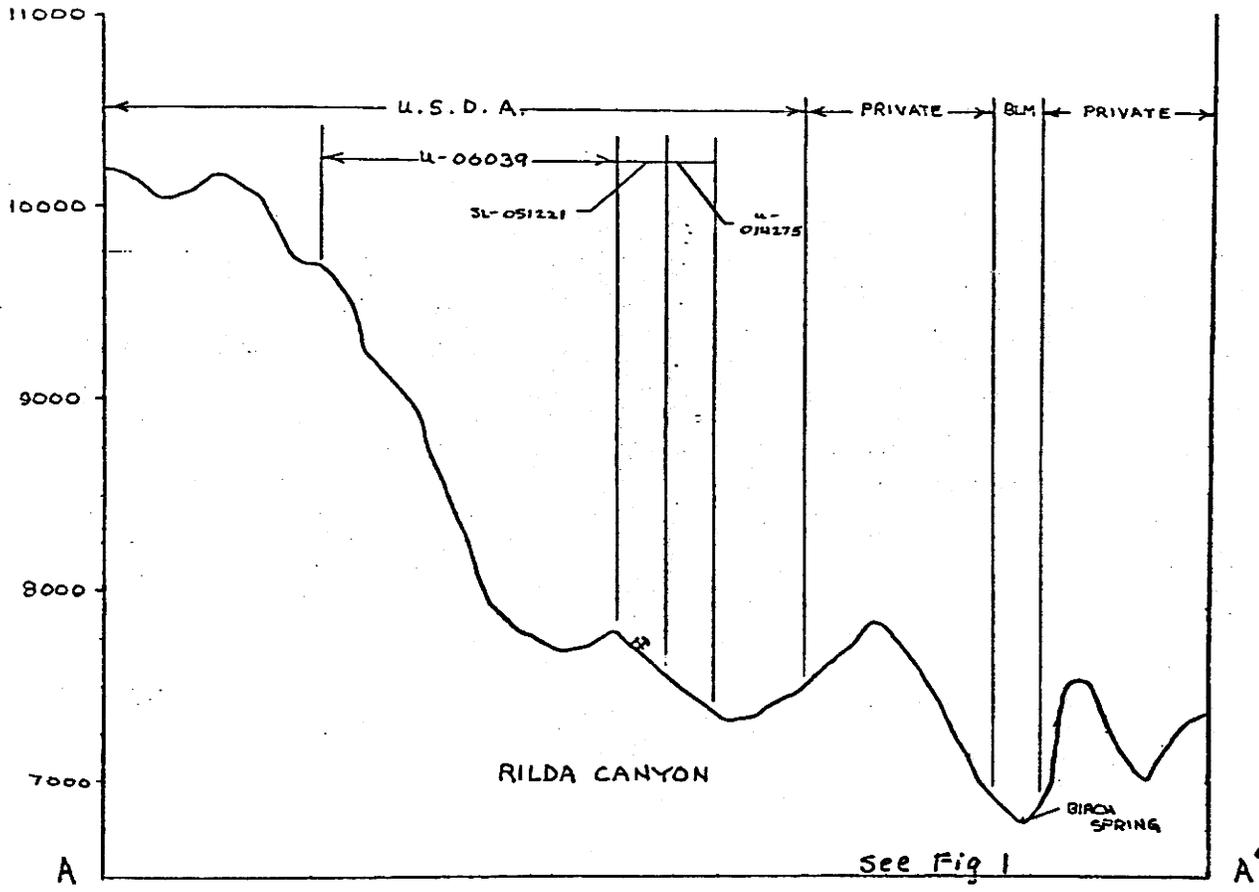
Rilda Canyon drains eastward into Huntington Creek. Perennial flows are fed by springs which emerge from sandstone beds both above and below the Hiawatha coal seam. Major flows are rare, but do occur from storm runoff.

Altitudes within the lease areas range from about 7,400 feet to about 9,700 feet. Huntington Creek is at elevation 6,900 at the confluence with Rilda Canyon.

2. Geology and Seismicity

The Wasatch Plateau lies between the simple dome-like structure of the San Rafael Swell on the east and the highly faulted, structurally complex basin and range area on the west. The Wasatch Plateau occupies the transition zone between and has characteristics of both. It is commonly referred to as "lying along the hinge-line." Along the eastern part of the plateau, dips of the rock layers are gently westward as a continuation of dips of the west flank of the San Rafael Swell.

SURFACE MANAGEMENT AND TOPOGRAPHIC PROFILE FIGURE 3



HORIZONTAL SCALE 1:62500
VERTICAL SCALE 1 INCH = 1000 FT.

Many faults are found throughout the plateau. Most are tensional in nature and generally parallel to the regional structures. Most all significant faults have been mapped and located, however, some remain unmapped. The Joe's Valley fault, located about three miles west of the lease area, is the largest in the area. It divides the coal field into two areas. A series of north trending faults, most fairly small, begin about one and one-half miles east of the lease area and from a zone about 2 to 3 miles wide that is broken and badly jointed.

Most of the faults are of significance because of their effect upon coal mining and ground water. Refer to Figure No. 1 for known fault locations.

Some local changes in the dip of the formations occur giving rise to local broad gentle folds. These combined with the effects of faulting has created extensive regional jointing. Joints have a significant effect upon stability or steep ledge slopes. Separation of large pieces along joints cause rockfalls and talus accumulations. Within mine workings, joints can effect roof stability, and are openings along which ground water can flow.

Landforms and surface features throughout the area are generally controlled by the geologic structure, i.e., drainages tend to follow the strike of joint systems, the mountains are generally flat topped being protected from erosion by resistant flat lying layers, etc. Surface features that significantly influence mining are steep hill side slopes, ledges, excessive surface jointing, unstable soils, including large talus blocks which litter many slopes, and landslides.

Rock formations are of sedimentary origin and Cretaceous and Tertiary age. They are composed of alternating layers of clay shale, sandstones, minor conglomerate and limestones. Figure 4 presents the stratigraphic sequence of the formations present, gives a brief description, and shows their relative age. The figure also shows the relationship of the coal seams to the stratigraphy.

Within the lease area, the stratigraphic units includes the Mancos shale through the North Horn formation. The coal is found in two seams, both in the Blackhawk formation. The Hiawatha seam is the lower seam and lies upon the Starpoint sandstone. The Blind Canyon seam is located about 100 feet above the Hiawatha seam.

Series	Stratigraphic Unit	Thickness (feet)	Description	
Eocene	Green River Formation	-	Chiefly greenish lacustrine shale and siltstone.	
Paleocene	Wasatch Group	Colton Formation	300-1,500	Varicolored shale with sandstone and limestone lenses, thickest to the north.
		Flagstaff Limestone	200-1,500	Dark yellow-gray to cream limestone, evenly bedded with minor amounts of sandstone, shale and volcanic ash, ledge former.
		North Horn Formation (Lower Wasatch)	500-2,500	Variegated shales with subordinate sandstone, conglomerate and freshwater limestone, thickens to north, slope former.
?				
Maestrichtian	Mesaverde Group	Price River Formation	600-1,000	Gray to white gritty sandstone interbedded with subordinate shale and conglomerate, ledge and slope former.
		Castlegate Sandstone	150- 500	White to gray, coarse-grained often conglomeratic sandstone, cliff former, weathers to shades of brown.
		Blackhawk Formation <i>MAJOR COAL SEAMS</i>	700-1,000	Yellow to gray, fine- to medium-grained sandstone, interbedded with subordinate gray and carbonaceous shale, several thick <i>coal</i> seams.
Campanian		Star Point Sandstone	90-1,000	Yellow-gray massive cliff-forming sandstone, often in several tongues separated by Masuk Shale, thickens westward.
Santonian	Mancos Shale	Masuk Shale	300-1,300	Yellow to blue-gray sandy shale, slope former, thick in north and central plateau area, thins southward.
		Emery Sandstone <i>COAL (?)</i>	50- 800	Yellow-gray friable sandstone tongue or tongues, cliff former, may contain <i>coal</i> (?) in south part of plateau if mapping is correct, thickens to west and south. <i>Coal</i> may be present in subsurface to west.
Coniacian		Blue Gate Member	1,500-2,400	Pale blue-gray, nodular and irregularly bedded marine mudstone and siltstone with several arenaceous beds, weathers into low rolling hills and badlands, thickens northerly.
Turonian		Ferron Sandstone Member <i>MAJOR COAL SEAMS</i>	50- 950	Alternating yellow-gray sandstone, sandy shale and gray shale with important <i>coal</i> beds of Emery coal field, resistant cliff former, thickens to the south.
Cenomanian		Tununk Shale Member	400- 650	Blue-gray to black sandy marine slope forming mudstone.
	Dakota Sandstone	0- 60	Variable assemblages of yellow-gray sandstone, conglomerate shale and <i>coal</i> . Beds lenticular and discontinuous.	
Albian	<i>MINOR COAL</i>			

Figure 4 Generalized section of rock formations, Wasatch Plateau coal field.

Rocks of the Blackhawk formation are predominantly of fluvial origin and are lenticular, interlayered, gradational, and show evidence of old channels. Consequently, the lithology of the formation changes from area to area and sometimes in short distances. These changes are not only reflected in sandstone and shale beds but also in the coal seams.

Effects of this changing lithology upon mining of coal may be expressed in thinning or thickening of the seam, rock layers that split the coal seam, rolls, and punchouts of the seam. Also ancient streams eroded channels which removed coal and are now backfilled with sandstone, commonly referred to by the coal miners as "wants."

The interlayered nature of the sandstone and shale creates a condition of perched ground water aquifers and to a large extent, controls ground water movement and recharge.

In addition to faults and joints, the layered nature of the sandstone and shale formations also has an effect upon the recharge of ground water and to a large extent, controls ground water movement. The permeable sandstone beds serve as aquifers, while the shale confines the water to the individual sandstone beds.

Surficial deposits are derived from weathering and erosion of the rock formations. Several types are present on the lease area and include thin residual soil on the flat benches, alluvium consisting of sandy clays and sands with varying quantities of gravel to boulder size fragments of sandstone along the streams and drainages, and slope wash and talus materials of clay and sandstone fragments on the side slopes. These materials range from shallow to moderate in depth, changing rapidly in short distances.

The steeper side hill slopes are usually outcrops of rock in step-like sandstone ledges and shale slopes littered by talus blocks from inches to several feet in size. The talus blocks are usually stable but any disturbance of the slope may cause further downslope movements. Talus blocks upon occasion become dislodged from the slopes and ledges by natural processes and rockfalls result.

The general area has experienced numerous seismic events. Data gathered between the years 1850 to 1965, instrumental and non-instrumental, indicates that the area experienced 29 earthquakes with epicenters within 30 miles of the lease area.^{1/} All of these

^{1/} "Seismicity in Utah, 1850 Through June, 1965," K. L. Cook and R. B. Smith. Seismological Society of America, August 1967.

events were less than 4.9 on the 10-point Richter Scale and no apparent damage was reported. The causes of these earthquakes are considered to be movement along faults with major fault zones and rockbursts associated with mining activity. Local fault zones include the Pleasant Valley fault zone 10 miles north of the lease area, the Joe's Valley zone 10 miles west of the lease area, and the Gordon Valley zone 20 miles northeast of the lease area.

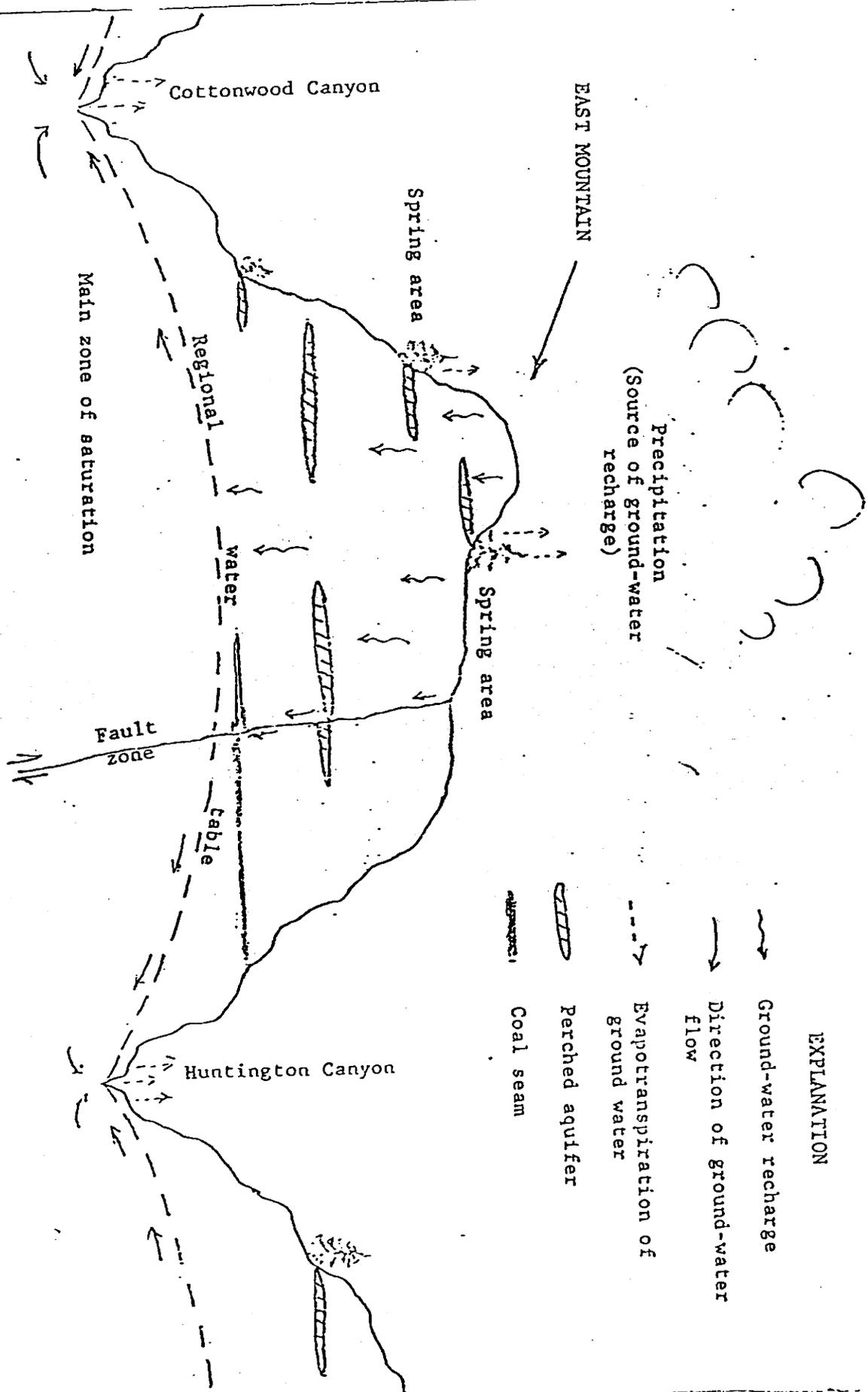
The greatest earthquake intensities, recorded in the area of the lease, were 4.0 to 4.9 on the Richter Scale. A seismic rating of Zone 2 has been given to the area, indicating that moderate earthquake damage is possible, with the possibility of loss of life through landslides, rockfalls, or roof falls.

3. Ground Water^{1/}

Most of the ground water in this coal lease is tributary to Rilda Canyon Creek, a tributary of Huntington Creek; a minor amount of the ground water in the northern part of the lease probably flows to Mill Fork, also a tributary of Huntington Creek. The relation between the coalbeds and regional water table in this area is not known, but it appears highly probable that the coalbeds extend beneath the regional water table (into the main zone of saturation) in the western and northern parts of the lease area where the water table is assumed to be highest. Springs discharge near the confluence of the main canyon and south fork within the lease area. These have been developed for use in the city of Huntington public supply system. Field tests July 15, 1976, of seepage in the area of the spring in the main canyon indicate that the total dissolved-solids concentration of the water is less than 500 mg/l. Data were not available regarding concentrations of individual mineral constituents in the water, but the concentrations apparently meet Utah Division of Health standards as the water is used for public supply.

Mining and subsequent subsidence in the area of these leases may disrupt perched aquifers and alter the local ground water flow system to some extent. Mine drainage apparently was not required during an earlier mining operation in this area; however, extension of mine workings from the outcrop areas in Rilda Canyon to the westernmost and northernmost margins of the lease area probably would intercept significant quantities of ground water as this area receives 25 to 30 inches of precipitation annually, generating significant ground water recharge. This indicates that mine drainage ultimately would be required. Mine drainage would not

^{1/} Don Price, U.S. Geological Survey, Water Resources Division, memorandum dated July 30, 1976. Full text of report in Appendix.



EXPLANATION

Ground-water recharge

Direction of ground-water flow

Evapotranspiration of ground water

Precipitation (Source of ground-water recharge)

Perched aquifer

Coal seam

Figure 5.--Diagrammatic section showing the general features of ground-water occurrence and movement in the East Mountain area.

divert water from Rilda Canyon, but it may reduce natural ground water discharge (seeps and springs and evapotranspiration) along the bottom of Rilda Canyon. This could include the springs used for the city of Huntington public water supply. Mining of the coal in this lease area, therefore, doubtless would create water-right problems with regard to those springs.

Ground water in the northern part of this lease area is apparently tributary to Mill Fork, consequently mining, with possible mine drainage, activities in this part of the lease could divert some ground water from the Mill Fork drainage resulting in additional water-right problems.

Rock fracturing associated with subsidence may cause water to seep from shallow perched aquifers to progressively deeper aquifers. Although this may not result in a loss of water from the ground water system (it may actually enhance recharge), it might reduce the flow of some upland springs and seeps that discharge from the shallowest aquifers. Those springs are used by wildlife and livestock.

Mining of coal under normal operating conditions and prescribed regulations would have little adverse impact on the chemical quality of the ground water. It should be noted, however, that because ground water in this lease area has been developed for public supply introduction of even very small amounts of contaminants such as lubricants from mining equipment into the ground water could be considered a serious impact. It is unlikely that mining of these low sulfur coals would result in acid mine drainage.

4. Soils

The lease areas have been typed into three soil mapping units based on landform, geology, slope, and aspect. (See map figure 6.)

Mapping Unit 1 - This unit occupies the south and west facing slopes of steep rocky canyons. The upper canyon walls consist of very steep, rocky sandstone ledges with scattered, shallow sandy soils. Moderately deep, gravelly and cobbly soils have developed from sandstone parent materials in toe slope positions. These soils textures range from loamy sand to sandy clay loam. The inherent erosion hazard is moderate and revegetation potential is low. These soils are subject to dry creep and slope wash. They are moderately sensitive to surface disturbance.

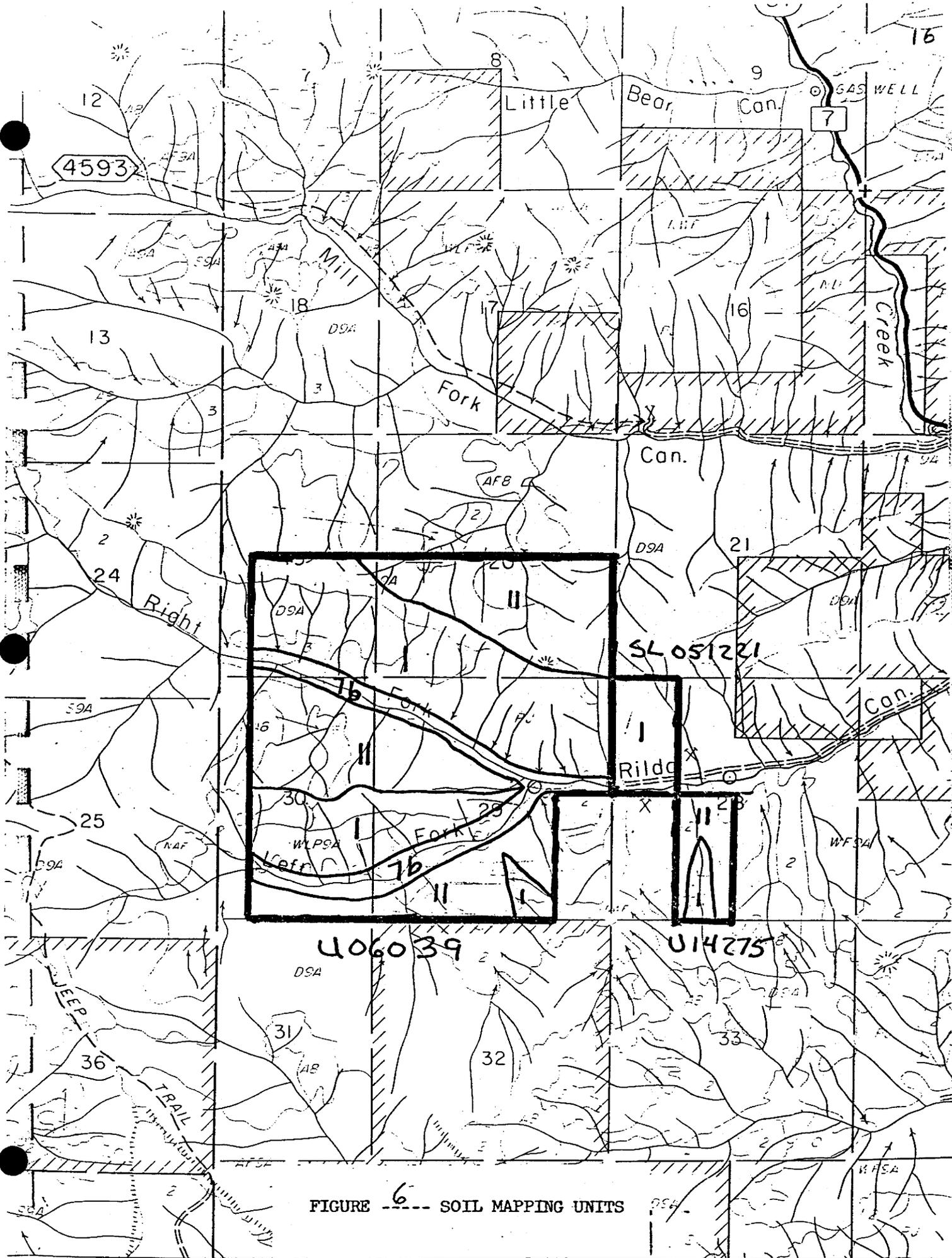


FIGURE 6 --- SOIL MAPPING UNITS

Mapping Unit 11 - This unit occupies the north and east facing slopes of these stream cut canyons. Slopes are very steep. The dominant soils have developed from sandstone parent materials. Typical soils have sandy loam surface layers over gravelly and cobbly sandy loam to sandy clay loam subsoils. These soils have moderate inherent erosion hazards and moderate revegetation potentials. They are generally stable, but have a moderate sensitivity to surface disturbance.

Mapping Unit 76 - This unit consists of narrow stream bottoms and flood plains. Soils are highly variable but are generally stable and have a low sensitivity to surface disturbance.

5. Climate

Climatic conditions above the escarpment on East Mountain vary significantly from those found in the canyons below. The lower Huntington Canyon area is semi-arid with an annual average precipitation of about 12 inches. Above the escarpment, the average annual precipitation is from 20 to 30 inches. Moisture is from winter snow and summer thunderstorms, with heavier snows at the higher elevations. Intense thunderstorms during the summer months are common.

Prevailing winds, in the lower canyon areas, are from the southwest with variations due to local canyon breezes. Upon the plateau, prevailing winds are generally from the southwest and west.

Temperature patterns for the lower canyons, based on records from Hiawatha 10 miles northeast of the leases, shows July the warmest month with an average daily maximum of 82°F and the coldest month, January, with an average daily temperature of 32°F. Based on 38-year Hiawatha records, the average annual temperature is 45°F. The temperature rises above 90°F only about two days per year and falls below 32°F on about 170 days per year. In the higher elevation of the leases (9,600 feet elevation) the mean annual temperature would drop markedly.

6. Hydrology^{1/}

Primary emphasis was placed on lease U06039, as this area has the highest hydrologic resource potential. Leases SL051221 and U14275 present little opportunity for hydrologic evaluation due to their relatively small size.

^{1/} Taken from "Technical Examinations - Input for Developing E.A.R. for Coal Lease Continuance" by John Rector and Jim Anderson. Full text in Appendix.

The lease was divided into three contributing watersheds, watershed A, the right fork of Rilda Canyon, watershed C, the left fork of Rilda Canyon, and watershed B, which begins below the confluences of the right and left hand fork. Flood frequency and magnitude curves were developed for watershed A and combined watersheds A, C, and A, B, C.

The following table summarizes the curves:

Annual Floods

Recurrence Interval in Years	Peak Discharge CFS		
	Watershed A Rt. Fk. Rilda	Watershed A, C	Watershed A, B, C Rilda Canyon
2.5	100	137	159
5	151	207	240
10	189	259	300
20	229	312	363
50	280	382	444
100	325	443	515

Upper north slope timbered areas of the drainages do not presently contribute significant quantities of surface runoff but are responsible for the majority of base flows. Conversely, the upper south slopes produce the majority of summer storm peak runoff and contribute only marginal water to base flow. This implies that surface disturbance on the timbered upper north slopes would have a more dramatic effect on increased runoff than comparable disturbances on the upper south slopes. Normal annual precipitation in the upper reaches of the drainages is between 25 and 30 inches.

Lower canyon areas are rocky and poorly vegetated. Rainfall interception and infiltration rates are low. As a consequence, the majority of incident precipitation runs off and is rapidly delivered to drainage systems. The implication is that development in these lower portions of the drainages would have little marked effect on increasing flood potentials over those that normally exist. Normal annual precipitation in the lower portions of the drainages is between 20 and 25 inches.

Estimated water yields from the lease area using a nomograph from "Water Yields in Utah" (Bagley et. al., 1964) is 11.5 area inches average runoff. Based on stream gage records, an average annual yield for the entire Huntington Creek drainage was found to be 7.33 inches/year.

From the above comparison, it can be seen that this lease area contributes higher than average quantities of water to Huntington Creek.

A non-point water quality monitoring program of Grimes Wash (Wilberg Mine) has been continuous since May of 1975. Although this sample point is eight miles south of the lease areas, the geologic stratas throughout this area are the same. Consequently, the geo-chemical loading potential is highly similar. From this limited data, some rudimentary evaluation can be made.

The waters are presently oligotrophic, low in biological productivity. There are sufficient primary nutrients present to allow for good productivity but the high pH and alkalinity inhibit growth of primary producers. Arsenic, hexivalent chromium and selenium are occasionally present at the lower limits of detection, however, the majority of the samples analyzed have shown no detectable concentrations: Iron concentrations have been found upon occasion to be in excess of State drinking water standards. Sediment concentrations are low during base flow, but show heavy loading during summer runoff events. This reflects the inherent erodibility of the landforms. Waters derived from the sandstone formations are lower in anions, i.e., sulfates, chlorides, carbonates, etc., than those waters flowing over marine shales. Bacteria levels show a high coefficient of variation. The fluxuation is felt to be the result of intermittent surface washing of fecal matter from wild-life and livestock, and decaying organic matter. The limited analysis indicates that at the time of sampling geology and landform were the major factors influencing water quality in Grimes Wash.

It should be kept in mind that the above is not all inclusive and is not intended to mean mining does not effect water quality. The Wilberg Mine was not completely developed at the time of sampling. Both house and maintenance areas were yet to be established. The potentials for pollution by bacterial loading, sediment generation, introduction of metals and reduction of pH are very probable but as yet unquantified.

The method to evaluate stream channels consist of a physical inventory and stability characterization of the drainages. Indicator characteristics are among other, channel side vegetation, slumping of channel, cutting or deposition of channel bottom, aquatic vegetation, algae, and cutting or deposition along channel sides.

Results of analysis of drainages within the lease area, specifically left and right fork of Rilda Canyon shows:

<u>Condition Class</u>	<u>Miles of Channel</u>	<u>Percent of Total</u>
Good	2.0	27%
Fair	3.0	41%
Poor	2.4	32%

7. Fire

The occurrence of wildfire, either man or lightning caused within the lease areas is low. According to records kept for the last ten years (Fire Occurrence Map 1966-1976) indicates that there were only two spot fires (less than .10 acre) within the lease area boundaries.

The potential for fire in the lease area ranges from moderate to moderately high, depending upon percent slopes and aspect. South exposures generally have a higher fire danger than do north facing slopes. There is a potential for large fires in Rilda Canyon, as well as all the lower side canyons of Huntington Creek. This is evident by the fact that two separate wildfires in Little Bear Canyon and Crandall Canyon respectively (to the north of the lease areas) burned extensive acreages within recent history.

On and adjacent to these properties are old coal piles, which may ignite by spontaneous combustion, and smother for years. Generally these fires are very difficult to extinguish.

8. Wildlife and Fish

The broken topography and the elevation differences of the area include a variety of habitat for wildlife. The area includes stands of timber and range land, providing "edge" of a varying quantity and quality, depending on locations within the lease. Edge is defined as, whenever two habitat types come together, the edge between the two types will be more favorable as wildlife habitat than either type considered alone.

The areas on the tops of the ridges are used as both winter and summer range by elk. The aspen timber type offers excellent calving areas for elk. The elk population in this area is in good condition and is increasing.^{1/}

^{1/} From conversation with Larry Dalton of the Utah State Division of Wildlife Resources.

Mule deer also inhabit this region. They use the lease area and the surrounding territory for both summer and winter range. During severe winters or periods of deep snow, the majority of the deer will move into the canyons for shelter and feed. The deer population suffered winter kill in 1972-1973, and since has been slowly recovering.

The lease is within the Utah State Division of Wildlife Resources deer hunting unit #34 and elk hunting unit #12. Hunting pressure has been heavy on both game animals throughout the area in the past few years.

Other game animals in the area that are legal during season are; sage grouse, ruffed grouse, blue grouse, cougar, black bear, and an excellent population of cottontail rabbits and snowshoe hare.

There are many birds that inhabit or frequent the area from time to time. They include the band-tailed pigeon, red-shafted flicker, sparrows, Audubon warbler, plain titmouse, nuthatches, Clark nutcracker, pinion jay, usually found in the lower areas, robin, mountain bluebird, raven, turkey vulture, great horned owl, screech owl, goshawk, red-tailed hawk, rough-legged hawk, and golden eagle. The "Unique"^{1/} northern bald eagle spends some time here during the winter. The threatened prairie falcon and the endangered^{2/} American peregrine falcon have been sighted in several locations throughout the region. The threatened spotted bat may occur at lower elevations near water.

There are a large variety of smaller, non-game animals that reside in or use the area. They include the bobcat, which is protected at this time, coyote, red fox, gray fox, badger, beaver, porcupine, striped skunk, mink, weasel, marmot, western pocket gopher, least chipmunk, flying squirrel, rock squirrel, golden mantle ground squirrel, deer mouse, and several other species of mice.

The amphibian and reptile populations include the leopard frog, woodhouse toad, and salamander. There are also the garter and the western rattle snakes.

^{1/} "Unique" is a Forest Service classification for species of scientific, local, or national interest.

^{2/} U.S. Fish and Wildlife classification.

There are no fisheries in the vicinity of the lease, but the streams that drain the lease area flow into Huntington Creek which is an important fishery. Huntington Creek provides some of the best stream fishing in this part of Utah. The upper 32 miles of stream is classified as Class III (of significant importance to the State fishery program) while the lower 24 miles of stream is rated as Class V and VI (of little or no value to the State fishery). The more valuable fishery sections of stream are upstream of the power plant. The Rilda and Mill Fork tributaries enter Huntington Creek 3 to 4 miles above the power plant. Management activities on this lease could have some effect on that portion of Huntington Creek.

The following species of fish are found in the upper portion of Huntington Creek; cutthroat trout, brown trout, rainbow trout, brook trout, speckled dace, mountain sucker, and mottled sculpin.

The Utah Division of Wildlife Resources periodically stocks this section of stream with cutthroat, rainbow, and brook trout. The brown trout population is self-sustaining.

There are no threatened or endangered species of fish living in this watershed.

Some impacts to the wildlife and their habitats by developing the lease will come from further encroachment on winter range in Huntington Canyon and the side canyons. This includes increased traffic from workers and coal trucks which subjects the wildlife to increased collisions with vehicles, poaching, sights, sounds, and smells, as well as other disturbances. An increased human population, associated with development, means more hunting pressures and more people through sightseeing, picnicking, camping, and other out-of-door activities, will be in direct contact with the wildlife in more areas of their habitat.

These pressures on the wildlife will have an adverse effect on the present and future local wildlife populations.

9. Vegetation

The vegetation types follow the elevation, aspect and precipitation patterns. Generally, the lower elevation vegetation is comprised of the pinyon-juniper timber type with sagebrush and grass in the

understory. From 8,000 to 8,700 feet the predominant vegetative type is sage-grass. Above this is the aspen type with the spruce-fir communities on the north aspects, flat ridges and higher elevation basins.

The pinyon-juniper community, comprised of pinyon pine, Utah juniper, and Rocky Mountain juniper, make up approximately 345 acres of the lease areas. There are 110 acres of untimbered rangeland comprised of grass, forbs, and brush. Here the most dominant plants are; Kentucky bluegrass, crested wheatgrass, western wheatgrass, Columbia needlegrass, western yarrow, American vetch, pentstemon, big sagebrush, twistleaf rabbitbrush, rose, and currant. Another 55 acres of the lease areas are dominated by quaking aspen. Approximately 965 acres consist of the spruce-fir timber types, white fir, Douglas-fir, Engelmann spruce, and blue spruce. The associated understory of this timber type is mountain brome, snowberry, buffalo berry, twinflower, blueberry, and mitewort. There are also approximately 45 acres of limber pine on the leases.

There are no known rare or endangered species of vegetation on the lease area.

10. Socio-Economic

The coal mining industry within Emery County has shown several periods of renewed growth and sudden decline. During the 1950-1960 census period, population of Emery County declined 8.79 percent. From 1960-1970, Emery County's population declined .74 percent per year. From 1970 to 1973, the population increased from 5,137 to an estimated 6,200 persons, a 21 percent increase. From 1973 to 1974, 561 new miners were employed, a 33 percent increase.

Presently, coal mining and power generating companies are expected to bring 4,741 new mining employees to the Carbon-Emery area by 1979 (not including any associated construction employment).

The reversal from past population trends is expected to continue in response to the Federal drive for energy self-sufficiency, and the demand for low sulfur coal.

An indication of the trend is the 1971-1972 increase in average number of non-agricultural jobs which was 10 percent for the Carbon-Emery area compared to 6.6 percent for Utah. From January to June 1973, the rate of increase for Carbon-Emery was 13 percent (Utah Industrial Development Information System (UIDIS, 1973)).

The addition of workers and their families to the Carbon-Emery area has created a severe housing shortage. Prices of rental units have increased from an average monthly rate of \$58.00 in 1970 to approximately \$250.00 in 1975. During this same period of time, medium home values have risen from \$8,500 to \$24,000. Existing mobile home parks are expanding and new ones are being planned. Existing spaces are generally in unimproved areas and offer little in the way of comforts found in most residential areas. The housing shortage is expected to be accelerated as construction is not keeping pace with the demand. (Statistical Abstract for Utah 1973 and Utah Construction Report, Bureau of Economic and Business Research, July 1975.)

Although it would be difficult to quantify how the future mining of these particular leases may contribute to the overall impact of Carbon-Emery area, it would be reasonable to assume that mining of these lease areas may contribute significantly to the economic impact.

The rapid expansion of population will temporarily overload school systems and public services. This will create problems in local planning in being able to finance public services to accommodate this growth. Increased population will also create additional demands on outdoor recreation facilities and put a greater stress upon the existing wildlife population.

11. Historical and Archeological

- Numerous archeological sites, associated with the Fremont Indian culture, have been identified in the region. Most of these are located in the lower valley areas and none have been identified in the vicinity of the lease area. However, if any surface disturbance is anticipated during investigations, or lease development, an archeological survey should be conducted prior to any such disturbance.

12. Public Health and Safety (Toxic Materials)^{1/}

Activities associated, directly and indirectly, with mining would create conditions where surface or ground waters may become contaminated with toxic materials. Ground water encountered during mining may experience increased hardness due to rock dusting, or possible contamination from lubricants used in mining equipment.

The coal is low in sulfur, about .5 percent, and toxic solutions should be no different than that presently involved in other mines operating in the near vicinity. On April 26, 1976, it was reported that a water analysis was made at Deer Creek Mine giving an average pH of the mine water as 7.4 by the U.S.G.S. Water Resource Division.

Surface waters may become contaminated by air-borne coal dust or water percolating through existing stock piles. Dust particles would come mainly from old piles and deposits. Actually, dust hazards are properly taken care of with the underground operation. There is dust generated underground but it is greatly minimized by adherence to regulations initiated by both Federal and State agencies. De-icing chemicals and other toxic materials, resulting from accidental spills along roadways, could find their way into streams.

No hazardous mine workings are known to exist. Portals on the outcrop are properly guarded or the main gate is closed when the mine is not operating.

No activities contemplated would cause flooding. If underground waters are encountered, some could be utilized in the lessee's operations with excess amounts pumped to the surface.

All waste and toxic materials produced by mining operations shall be disposed of in controlled surface waste areas, and such areas must be adequately rehabilitated at termination of the mining.

^{1/} Taken from U.S.G.S. memorandum, dated September 13, 1976. Full text is in Appendix.

13. Timber Management

The tree species within the lease areas are pinyon-pine, Utah juniper, Rocky Mountain juniper, quaking aspen, white fir, Douglas-fir, Engelmann spruce, blue spruce, and limber pine. (See the section on vegetation for acreages.)

The commercial value of the timber on the lease areas is low. Most of the timber is classified as non-commercial because of: (1) its scattered nature, (2) steepness of terrain and inaccessibility, (3) the size classes available, (4) economics, (5) environmental constraints, and (6) mill locations and timber market conditions in the area.

There are no timber management activities planned on the leases or the adjacent areas for at least the next five years.

The timber is located primarily on north facing slopes, in draws, basins, and in general, wetter areas.

There is little impact expected on the timber through the mining of this lease.

14. Range Management

The leases fall in four range allotments, the East Mountain and Trail Mountain Cattle and Horses Allotments on the Ferron Ranger District, and the Gentry Mountain Cattle and Horses and Crandall Ridge Sheep and Goats Allotments on the Price Ranger District.

Approximately 110 acres of the total included in the leases are used as rangeland for grazing of domestic animals. This is on the Gentry Mountain C&H Allotment, and is classified as unsuitable as good range. The remaining acreage is classified as non-range and is not used for grazing because of timber, slope, accessibility, and scarcity of grazable vegetation.

The only range improvements on the leases are retaining fences which enclose the developed springs in Rilda Canyon.

The maintenance of the present water supplies is the main concern of range managers through the mining of these leases.

15. Recreation/Esthetics

Recreational use of the lease areas is limited to hunting, sightseeing, picnicking, and hiking activities. The major visitor impacts are felt in the area during the deer and elk hunting seasons in the fall of the year.

Access into the area is by low standard dirt road along Rilda Canyon, which can be traveled, when dry, by pickup or passenger car.

There are no developed campgrounds within the lease area, nor are there any planned for the future.^{1/}

In a Travel Plan (Off Road Regulations) dated August 14, 1975, the following restrictions have been proposed within the area. The area is open May 1 through November 15 only to foot and horse travel and motor vehicles on existing routes. No travel restrictions are imposed from November 16 through April 30.

The natural beauty of the lease areas is typical of lower Huntington Canyon. Although Rilda Canyon is not pristine (there is an accumulation of junk and buildings around the old mines), colorful displays of exposed rocks, timbered north slopes, and small streams of water does offer a pleasant visual contrast to the nearby desert.

The lease areas are several miles from Forest 7 and are not visible to the highway traveler.

16. Minerals Other Than Coal

Much of the Wasatch Plateau area is leased for exploration and development of oil and gas. Oil and gas leases held by John Snyder, Billings, Montana (#U15209) and Roger Williams Development Company, Providence, Rhode Island (#U23270), cover portions of all three leases.

Considerable interest and some investigation for oil and gas (mostly seismic) are currently being performed by a few oil and gas lease holders; none, however, in the coal lease area.

There are no other known mineral resources present within the lease area.

^{1/} National Forest Recreation Site Inventory.

17. Transportation

Most of the lease areas are accessible by an unimproved road and trails. There is a low standard dirt road that leaves the paved Huntington Canyon road, S.R. 31, and follows the bottom of Rilda Canyon into the lease area. It continues up the canyon to where the Left and Right Forks of Rilda Canyon converge. Here the road divides and a short segment of road follows each fork. This road makes the bottom of the leases accessible, but the only way you could travel to the top of the leases would be on foot or by horse.

The lease areas are steep, rugged terrain which, except for the road in Rilda Canyon, are unroaded, and will likely remain unroaded in the future.

18. Administrative Improvements

The Department of the Interior commenced the surveying of T. 16 S., R. 7 E. on July 6, 1976. This includes the brass-capped monumentation of all section and quarter corners. They are expected to complete the survey sometime in the near future.

Other administrative improvements on the lease areas include the range improvements previously discussed in the Range Management Section.

19. Special Uses

A special use permit is currently held by the North Emery Water Users Association for the purpose of providing a domestic water supply. The permit grants permission for the collection and transmission of water from springs located in Rilda Canyon; Sections 27, 28, and 29, T. 16 S., R. 7 E.

Development of the springs has been accomplished by the construction of concrete cutoff walls and installation of perforated pipe to collect the water. The water is then transmitted by a 6 inch underground pipeline to the Huntington City water line at the mouth of Rilda Canyon.

IV. Summary of Probable Adverse Environmental Impacts Which Cannot be Avoided (Residual Impacts)

Subsidence of the land surface is a major factor in coal mining activities and in the future use of the land surface above mine workings. The magnitude and effects subsidence will have upon these activities and uses are not fully understood. It is known that subsidence does occur over mined out coal seams, and that several factors influence the rate and extent to which it will occur. Of these, the mining method, thickness of the coal seam, and the depth and lithology of the overburden materials are the most significant.

Four mining methods can be anticipated to be employed, depending upon conditions and nature of the coal seams. These methods include conventional, continuous room and pillar, longwall, and shortwall.

In both conventional and continuous room and pillar mining, part of the coal bed is left as pillars to support the overburden. These pillars are not removed until the mine boundaries have been reached. For this reason, significant subsidence in most cases cannot occur or begin to occur until the pillars are removed late in the mine life. Subsidence has been known to occur where room and pillar mining was used and pillars were not removed. Here, however, overburden materials were thin and weak and unlike that in the lease area.

Shortwall and longwall mining both are continuous full extraction methods and the overlying strata are permitted or induced to cave as mining of each given segment is completed, in order to reduce pressures on the coal seam. Subsidence, using these mining methods, would occur as the mining progresses. It is, however, difficult to predict the time involved in which the land surface might subside, as this is dependent upon the thickness and lithology of the overlying materials which are variable from mine to mine.

The longwall and shortwall mining methods are preferred over room and pillar methods for both economic and environmental reasons. Long and shortwall mining, under proper conditions, are the more economical methods of removing a higher percent of the coal, which better utilizes the natural resource.

Impact to the surface from subsidence may be substantially less from longwall mining than from conventional methods. Continuous removal of the coal allows the overlying strata to bend rather than fracture. Observation has shown that this is generally less disruptive to the land surface and to natural ground water flow.

It is expected that a combination of these mining methods will be used as the mine conditions permit to obtain maximum coal extraction, and maintain required safety practices. Estimates are that from 40 percent to 70 percent of the coal will be removed.

Two seams of coal having a combined thickness of about 15 feet are to be mined on the lease areas. A rule of thumb used by many to estimate the amount of subsidence which might occur is; subsidence of as much as 50 percent of the combined thicknesses of the coal seams removed can be expected at the ground surface. Some authorities predict that under certain conditions, subsidence could be as much as 70 percent in a particular mine. This, however, does not indicate the time-period involved and assumes full extraction of the coal seams, and the percent subsidence would be proportionally less with a lesser percent of coal removal.

The depth from the surface to the coal varies, but it will be in a range from 300 to 2,000 feet. This depth will influence the amount of subsidence at the surface as broken rock occupies a larger volume of space than unbroken rock. Fractures associated with the caving will propagate upward until the void left by coal removal is filled with broken rock. The amount of rock above the seam that will be fractured depends upon the depth of the seams, the volume of coal removed, and the nature of the overburden.

The nature or the lithology of the materials overlying the coal can have a great effect upon the amount and rate of subsidence, and also upon the method of mining and of coal recovery.

Curved like a bow, zones of compressive stress called compression arches, tend to occur above and below the mine panels and transfer the overburden load in coal extraction areas to adjacent solid coal boundaries or barrier pillars. The caving and flexure of strata in the distressed zone encompassed by the arches into the mine cavities tend to increase the stresses again in the mine workings. Flexure of strata also produces tensile and compressive stresses within lithologic units and shear stresses across lithologic boundaries. As time goes by, the mine voids are widened, the compression arches migrate higher in the overlying strata and eventually may reach the surface. This migration continues to transfer overburden stresses back into the extraction area from the mine boundaries or barriers. The rate of migration of compression arches, and consequently the rate of stress transfer, depends on thickness and strength of overburden strata, duration and rate of mining, mine geometry, and mining sequence.

Subsidence of the land surface should be expected in varying degrees over the lease area from very little, to perhaps several feet in some areas. The effects of subsidence are expected to be similar to those observed at other mines in the vicinity. It is expected that subsidence will be gradual and, in most cases, will begin to some degree at the onset of the mining and will continue beyond the life time of the mining.

Subsidence effects have been casually observed at several locations. Only casual observations were made. Measured data are unavailable which have evaluated the magnitude and effect of the subsidence.

Most features observed are subtle and include small slumps on steep slopes, slight depressions, and some tipping of trees and shrubs. Drainage patterns did not appear significantly changed or erosion increased. From casual observation, the present land use did not appear to be affected or changed significantly.

There were no observed features developed from mine subsidence that pose possible hazards to human or animal life, or are deleterious to present land uses.

The effect subsidence had upon the natural ground water flow system in areas which have subsidence could not be determined by observation and is, therefore, unknown. This would require a monitor and inventory program established prior to mining. It is expected, however, that mining and subsidence will have some significant effect upon the natural ground water flow. Interception of water courses by mining and fracturing of aquifers by subsidence may alter flow patterns, increase recharge, and change spring flows.

V. Relationship Between Short-Term Use of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

Most of the major long-term effects result from the conjunctive development such as portals, conveyor systems, power plants, etc., and not from the proposed action itself.

The proposed action over the long-term will consume a non-renewable resource and will deny its use for future generations.

Long-term productivity based on pre-existing quantity of ground water aquifers may be reduced if aquifers are contaminated due to mining operations. Where pressure of an aquifer is reduced, reduction of dependent productivity will be permanent. Disruption of an aquifer by underground mining may permanently affect water availability.

VI. Irreversible and Irretrievable Commitment of Resources

1. The major commitment of resources will be the mining and consumption of coal over a 40 year life of the mine. This coal will be an irretrievable commitment of resources and unavailable for other uses once consumed.
2. Extraction of coal and conjunctive development would require a commitment of liquid fossil fuel, electric power, lubricants, explosives, manpower, machinery and structural materials. This material and effort will be irretrievably lost to other uses.
3. Those ground water aquifers that would be physically disturbed during mining may be irreversibly changed. The chemical quality of water in some aquifers could be irreversibly changed.
4. During the lifetime of the mine the land use capabilities within the facility boundaries would have shifted almost totally to an industrialized and urbanized base.

VII. Alternatives to the Proposed Action

Keeping in mind the scope of this report, that is readjustment of the terms of a Federal Coal Lease, alternatives to the proposed action are limited.

It is not within the scope of this report to discuss alternatives of developing the lease. We have no indication from Peabody Company concerning their mining and operation plans for the lease areas. Should some surface disturbing action be proposed by the company, this action and those alternatives applicable for this action will be evaluated under a separate Environmental Analysis Report.

It is also not within the scope of this report to evaluate the alternative of terminating the lease. This alternative is not legal under the 1920 Minerals and Leasing Act. This Act gives the Government only the right to readjust lease terms every 20 years, the lease itself may be held in perpetuity.

The only viable alternative to the proposed action is to continue the leases under the old terms, i.e., do not readjust the lease terms.

This alternative would result in:

1. A loss of royalty revenue to the Government.
2. Coal lands being held for speculative purposes and not diligently developed.
3. Retaining antiquated lease stipulation (Circa 1956) which are not in line with (1) The Multiple Use Act of 1960, (2) National Environmental Policy Act of 1969, and (3) various clean air and clean water Federal and State Statutes.

The proposed action would require an advanced royalty on an assumed schedule of production. The lessee will pay the advanced royalty or the production royalty whichever is greater. These new stipulations will result in:

1. Assuming the receipt of a fair return for the sale of Federal Mineral Resource.
2. Stimulating production or abandonment of the lease.
3. Achieving an orderly and timely development of the lease.

VIII. Record of Out-Service Persons, Groups, and Government Agencies
Consulted

U.S. Geological Survey

Jim Travis - Salt Lake City
Ralph Blumer
Don Price

Bureau of Land Management - Salt Lake City

Lymond Moore
(Several Others)

Sam Rawley Price Office

Division of Wildlife Resources - Price

Larry Dalton

Utah Power and Light Company - Salt Lake City

George Alley
Mr. Porter
Mr. Neilsen

Peabody Coal Company - Deer Creek

Jim McSparin

IX. Management Requirements and Constraints

The effects and the impacts of subsidence over removed coal beds are dependent upon many factors, and in most areas not fully understood. The mining method, thickness of coal seams, depth and lithology of the overburden materials are possibly the most significant factors which influence the magnitude of subsidence. Past experience has shown that subsidence does occur with impacts upon surface resources varying from insignificant to high.

In order that the magnitude of the subsidence at the ground surface can be evaluated, a monitor-inventory program is required. This program should be developed in conjunction with the U.S.G.S. and should be continued until the necessary information is obtained. Areas of investigation should include changes of topography, underground and surface hydrology, and effects on vegetation.

Guidelines to effect these studies are contained in May 17, 1976, "Coal Mining Operating Regulations," Federal Register, Vol. 41, No. 96.

APPENDIX

- A. U.S. Geological Survey Conservation Division, memorandum dated September 13, 1976.
- B. U.S. Geological Survey, Water Resources Division, memorandum dated July 30, 1976.
- C. Technical Examination Input for Developing Environmental Analysis Reports for Coal Lease Continuances by John Rector and Jim Anderson.
- D. Geologic map of a portion of the Wasatch Plateau.

SL-051221
U-06039
U-014275

Office of the Area Mining Supervisor
Conservation Division
8426 Federal Building
125 South State Street
Salt Lake City, Utah 84138

September 13, 1976

Memorandum

To: Mr. Reed Christensen, Forest Supervisor, U. S. Forest Service, Price, Utah

From: Mining Engineer

Subject: Technical Examination for Coal Lease Readjustment of Terms for Continuance of Coal Leases SL-051221, U-06039, and U-014275, Peabody Coal Company

The subject technical examination was made as requested by your Forest Engineer, Bill Eoley. On July 14, 1976, the writer, accompanied by personnel from your office, and James Travis, Deputy Area Mining Supervisor from this office, made an onsite inspection of the surface of the Peabody Coal Company leases SL-051221, U-06039, and U-014275.

This memorandum will follow the format of the BLM technical examination checklist, Form 5040-3, as it involves the U. S. Geological Survey. Lease SL-051221 became due for continuance and adjustment of terms on November 5, 1974. Lease U-014275 became due for continuance and adjustment of terms on October 1, 1975, and lease U-06039 became due for continuance and adjustment of terms on May 1, 1973.

I. Background

Lease SL-051221, currently held by Peabody Coal Company, is located on the ~~W¹/₄~~ of sec. 28, T. 16 S., R. 7 E., SLM, Emery County, Utah, and consists of 80 acres.

The above acreage was initially leased to Rulon W. Jeppson on November 5, 1934. The lease then changed hands a number of times as follows:

Assignments

<u>From</u>	<u>To</u>	<u>Date</u>
Rulon W. Jeppson	Comfort Coal Co.	March 1940
Comfort Coal Co.	William Smith	March 1944
William Smith	F. F. Hintze then to Utah Coking Coal, Inc.	Dec. 1953
Utah Coking Coal, Inc.	Rilda Corp.	Aug. 1965
Rilda Corp.	Peabody Coal Co.	July 1971

Lease U-014275, currently held by Peabody Coal Company, is located on the E $\frac{1}{2}$ S $\frac{1}{2}$ sec. 28, T. 16 S., R. 7 E., SLM, Emery County, Utah, and consists of 80 acres.

The above acreage was initially leased to John Helco on October 1, 1955. The lease was then assigned to Ura Swisher on July 1, 1967. It was then assigned to Peabody Coal Company on January 1, 1973.

Lease U-06039, also currently held by Peabody Coal Company, is located on SE $\frac{1}{4}$ sec. 19, S $\frac{1}{2}$ sec. 20, sec. 29, and E $\frac{1}{2}$ sec. 30, T. 16 S., R. 7 E., SLM, Emery County, Utah, and consists of 1,440 acres.

The above acreage was initially leased to Ferdinand F. Hintze on May 1, 1953. It changed hands a number of times. In December 7, 1953, it was assigned to Utah Coking Coal, Inc.; on August 4, 1965, it was assigned to Rilda Corporation; and finally it was assigned to Peabody Coal Company on February 1972.

A partial assignment of 80 acres of the above 1,440 acres to Malcolm N. McKinnon took place on November 1, 1973. The location of the 80 acres is in the E $\frac{1}{2}$ SE $\frac{1}{4}$, sec. 29, T. 16 S., R. 7 E., SLM, Emery County, Utah. The description of the 80 acres is under U-24069.

The above mentioned leases are located about 11 miles northwest of Huntington, Utah, in Rilda Canyon, a tributary to Huntington Canyon. The same minable coal seams are present on all these leases. From our information on surrounding mines, we can assume that the coal seam thicknesses are fairly consistent throughout the area. From this we are assuming that the Hiawatha coal seam runs about 8 to 12 feet thick with a heating value of approximately

12,600 Btu's and a sulfur content of .5 percent, and the Blind Canyon coal seam, which is about 90 feet higher stratigraphically than the Hiawatha, has an approximate thickness of 8 to 10 feet with a heating value of about 13,000 Btu's and a sulfur content of .6 percent.

At the present, there are no active coal mines on the three leases. The Smith mines operated on lease SL-051221 from January 1935 to September 1950. The coal was mined in the Hiawatha coal seam with a total production of about 46,300 tons.

Lease U-06039 has not been mined. The Helco mine on lease U-014275 had been mined in the Hiawatha coal seam from April 1959 to April 1965 with an approximate extraction of 5,600 tons of coal.

Mine portals and surface facilities for the Smith mine are on the same lease as the mine SL-051221. Mine portals and surface facilities for the Helco mine on U-014275 are on SL-050862 which is held by McKinnon.

Our office has received no mine plans for any renewed operations in Rilda Canyon. It can be assumed that these holdings are being held in reserve by Peabody. At the moment, it appears that Utah Power & Light Company is in the process of acquiring all of Peabody's operations in Utah. Utah Power & Light Company has a number of operating coal burning powerplants in this region and new plants are in the planning. If the acquisition of Peabody by Utah Power & Light comes through, it would be a pretty good guess that the coal would be used in the nearby powerplants.

Peabody currently has a mine in Deer Creek Canyon which is adjacent to Rilda Canyon. It would be possible to mine the Rilda Canyon leases from their Deer Creek mine, but this would result in long underground coal haulage and difficult ventilation. From this, we assume that any development of these leases would be from Rilda Canyon. There is an estimated 40 million tons of coal in the two seams on the subject leases. With these reserves, a sizeable operation would be possible from Rilda Canyon.

(1) Exploration Operations

Peabody is considering conducting more development drilling in and around the Deer Creek operations. From these operations, and probable exploration in Rilda Canyon, the limits of the coal should be accurately defined. Our office has received no such exploration plans for Rilda Canyon, but it can be assumed that surface exploration would probably continue for the life of the mine and will generally precede the actual start of the mining to determine the nature of

the overlying strata, depth and thickness of the coal deposit, grade of coal, and often the quantity and quality of ground water. Development drilling is accomplished by truck-mounted drill rigs. Additional equipment used by a development drilling crew includes water trucks, personnel carriers, a hole logging equipment truck, and a dozer or blade to assist in obtaining access to the exploration area and drill site. Development drilling will require construction of access roads for equipment, drill pads to accommodate the drill rig, and other equipment and mud pits to hold drill cutting and mud. The time required to drill the holes will vary from several days to several weeks. The exploration crews will vary from 12 to 50 people depending on the intensity of exploration.

Drill site preparation will require the leveling of an area approximately 75 x 100 feet. A mud pit will be constructed at each site to collect return water and drill cuttings. The pit will be approximately 12 x 25 feet and 4 feet deep. Mud additives or foam agents are sometime used. Both materials are biodegradable. Roads are anticipated to be approximately 15 feet in width depending on topography and other site conditions.

Activity within the area of the drill rigs and along the access roads will be constant, and noise and dust will be created during the drilling operations. Changing of crews and the hauling of water to supply the rig will generate a substantial amount of traffic to and from the rigs.

Prior to abandonment, drill holes are cemented to a minimum of 50 feet above and below the coal seams as well as any water aquifers. Holes must be plugged to a depth of 5 feet below collar with a suitable plug and cement. All mud pits will be filled and the drill sites will be leveled and seeded upon completion of the holes.

(2) Underground Operations

As mentioned previously, there are no active mines on these leases. The Smith mine has not been mined since 1950, and the Helco mine has not been mined since 1965. It can be assumed that these old mine portals are probably in pretty bad shape, and rather than rehabilitate them, new entries would be made.

Presently, in surrounding operations, 5 to 7 parallel entries are driven from the surface in the coal seam. These are used for ventilation and conveyor belt or rail haulage.

Four mining methods can be anticipated to be employed in the coal mining operation, depending on the conditions and nature of the

coal seam. These methods include: conventional and continuous room and pillar, longwall, and shortwall mining.

Multiple seam mining can be expected to occur over a large portion on these three leases. Planned multiple seam mining will require the uppermost seam to be mined first to avoid hazardous caving and subsidence below other minable coal seams or active workings.

In both conventional and continuous room and pillar mining, part of the coal bed is removed by drilling parallel excavations or rooms. The coal remaining between the rooms becomes the pillar, which is pierced at certain intervals by breakthroughs or "crosscuts" to provide passageways for ventilation.

In conventional room and pillar mining, openings are developed in a uniform pattern within a panel or block of coal. Remaining columns of coal or pillars are left standing for support of the overlying strata. The coal is either cut or blasted from the coal face. The broken coal is then gathered by a loading machine which transfers it onto a shuttle car for transportation to a nearby conveyor belt. Continuous room and pillar mining is identical to conventional room and pillar mining except the mining is performed by a single machine, the "continuous mining machine." The continuous miner rips the coal loose from the coal face with mechanical cutters and loads the broken material directly into a conveyor belt or shuttle car. After the coal is removed, the roof is supported by either timber or steel supports, or more commonly "roof bolts," which bind the overlying roof into a "continuous beam." The pillars may be "pulled" or mined upon completion of mining and the roof allowed to cave. Longwall mining is a continuous full extraction mining method. The coal is mined in a single cut, no pillars are left, except the chain pillars from panel development, and the overlying strata is permitted or induced to cave once mining is completed. This mining method is particularly applicable when the coal bed is of uniform thickness, contains no hard partings which cannot be readily broken by mechanical means, and when roof support or control is very difficult.

The longwall machinery, consisting of a combination coal shear and plow, which rips the coal from the face in a continuous sweep varying from 2,500 - 7,500 feet long, a chain-type conveyor, and a set of hydraulically operated self-advancing roof supports, are installed along the face of the coal being mined. A conveyor belt is used to deliver the coal from the mine area. Caving of the unsupported roof behind the chocks follows virtually unhampered and with a high degree of safety to miners who remain under the canopy of supports.

Shortwall mining is a combination of the continuous mining and the longwall methods. Shortwall mining, as the name implies, is used on smaller coal blocks than longwall mining. The principles of roof support and post mining caving are the same as in longwall mining. Actual mining is accomplished by utilizing continuous mining machines and shuttle cars in place of the coal shear and plow and the chain type conveyor.

In areas where the thickness of the coal is nonuniform, longwall or shortwall methods lose their advantage, and room and pillar methods are employed. Where possible, maximum extraction mining methods such as "longwall," or continuous room and pillar with pillar extraction could be used. It is anticipated that most of the mining will be accomplished employing a combination of these methods.

Continuous room and pillar mining should be able to extract 40 to 60 percent of the coal. With longwall or shortwall, around 70 percent extraction could be expected.

Maximum extraction could result in surface subsidence over the long term. The depth from the surface to the coal varies, but it will be in a range from 300-2,000 feet. With multiple seam mining, in all probability, some surface subsidence would occur. It will depend not only on the distance from the seams to the surface, but also on the amount of coal removed under the methods of mining, and the stratigraphy of the formations above the coal seams. Broken rock occupies a larger volume of space than unbroken rock. The fractures associated with the caving will propagate upward until the void left after coal extraction is filled with broken rock. The amount of rock above the seam that will be fractured depends on the depth of the seams, the volume of coal removed, and the nature of the overburden. If conditions are unfavorable, then the fractures will eventually extend to the surface, causing differential subsidence. Partial extraction methods such as conventional or continuous room and pillar without pillar extraction mining methods would reduce or eliminate surface subsidence. Partial extraction would recover no more than 40 percent of the total in-place coal, and is less desirable from a standpoint of maximum resource recovery.

Subsidence plays a major role in coal mining activities and in the future use of the land surface above the mine workings. Stresses and deformation produced in mine workings, other coalbeds, bedrock, and at the ground surface by the processes of subsidence significantly affect mine safety, extraction efficiency, and also the surface environment.

Curved like a bow, zones of compressive stress called compression arches, tend to occur above and below the mine panels and transfer the overburden load in coal extraction areas to adjacent solid coal boundaries or barrier pillars. The caving and flexure of strata in the distressed zone encompassed by the arches into the mine cavities tend to increase the stresses again in the mine workings. Flexure of strata also produced tensile and compressive stresses within lithologic units and shear stresses across lithologic boundaries. As time goes by, the mine voids are widened, the compression arches migrate higher in the overlying strata and eventually may reach the surface. This migration continues to transfer overburden stresses back into the extraction area from the mine boundaries or barriers. The rate of migration of compression arches and consequently the rate of stress transfer, depends on thickness and strength of overburden strata, duration and rate of mining, mine geometry, and mining sequence.

Subsidence can be expected. A good rule of thumb is to expect a subsidence factor of up to 70 percent of the mining height if maximum recovery of the coal is obtained. Subsidence should not effect the present land use (grazing) to any great extent nor will it change significantly the drainage pattern.

Subsidence could cause some effect on surface springs and the natural ground water flow in the proposed coal-mining area as water bearing formations would be affected. However, little, if any, water would be lost from the ground water system.

Peabody's mine in Deer Creek Canyon has pumped up to 300,000 gallons of water per day from its mine. It can be assumed that any mine in Rilda Canyon would also produce water due to its close proximity stratigraphically to Deer Creek.

Water sprays on the mining machinery would use some of this water, but a considered amount would probably have to be discharged.

The mine water is subject to contamination during the mining of coal. Oil and grease from the mining machinery contaminates the mine water. Also, the water pumped from the mine picks up suspended sediments. Peabody presently skims the oil from the mine water before it is discharged into a water reservoir at Utah Power & Light's Huntington powerplant. Peabody Coal Company has a water discharge permit from EPA and the State of Utah. The water must meet Class C standards for discharge.

II. Resource Values for Nonmineral Environmental

This section to come under the Forest Service jurisdiction.

III. Public Health and Safety

Toxic Materials

The coal is low in sulfur, about .5 percent, and water discharges should be no different from that presently involved in other mines operating in the near vicinity. On April 26, 1976, it was reported that a water analysis was made at Deer Creek mine giving an average pH of the mine water as 7.4 by the USGS Water Resources Division. Oil and suspended solids will exist in the mine discharge and must be removed prior to discharge into any stream or drainage.

Fire Hazards

There should be no abnormal fire hazards as a result of drilling exploration or mining. The surface structures are generally constructed of fireproof materials and also equipped with proper fire extinguishers. The overall operations are subject to both State and Federal coal mining regulations which guard against fires.

Landslide Potential

The possibility of landslides may exist around the portals of the Smith and Helco mines. Subsidence of the canyon walls may cause landslides. For this reason, pulling pillars is not recommended in areas where mining nears the surface. Sufficient support should be left in place to support the overlying strata.

Hazardous Exploration or Mine Workings

The Helco mine has been abandoned since 1965, and it can be assumed that the old mine workings may be unstable. The mine and fan portals of this mine have not been properly abandoned, and could be considered dangerous to anybody entering into these workings. The Smith mine portals have caved open and could be dangerous to anyone attempting to enter or investigate too closely.

Dust

Dust is generated in underground mining but it is greatly minimized by adherence to regulations initiated by both Federal and State agencies. Surface dust in the mine yard and on adjacent access roads is also present but is localized. Dust suppression by sprinkling, surfacing, or etc., is usually required.

Flooding

No activities contemplated would cause flooding. If underground waters are encountered, some could be utilized in the lessee's operations with excess amounts pumped to the surface for disposal under approved permits. Mining operations should not materially effect present surface water patterns or drainages.

Waste Disposal

All waste material encountered in mining operations would be disposed of in controlled surface waste areas, and such areas must be adequately rehabilitated at termination of the mining. Disposal will be under an approved reclamation plan.

IV. Socio-Economic Considerations

Present and Projected Demand for Coal

There are presently no coal mining operations taking place on the leases. A future sale of these leases by Peabody to Utah Power & Light is possible with the coal reserves from these leases being used to supply Utah Power & Light Company's Gadsby, Huntington, and Emery powerplants.

Effects on Local Economy and Employment

Start-up of any mining operations on these leases would require an increase in employment or would mean the prolonging of employment in the area. The money generated would enhance the Emery County tax base and would certainly improve local economy.

Impact on Other Resource Values (Temporary or Permanent)

The major irreversible impact on topography and geology of the area from coal mining would be the possibility of subsidence and removal of coal.

Useable aquifers could be cut and such groundwater supplies be altered during the mining operations and subsequent to same.

No major impacts to vegetation or wildlife are expected, and the current surface use should not be affected.

V. Environmental Considerations and Reclamation Requirements

It is felt that the lessee is very responsible and would readily acquiesce to any requirements for rehabilitation or reclamation as required.

Bonding Requirements

There presently exists a nationwide surety bond in the principal amount of \$75,000 which is considered sufficient for current operations. If additional bond is deemed necessary, in the future, such coverage can and will be recommended.

Ralph J. Blumer

cc: Denver
Rogers Thomas, USFS, Price, UT 84501
RJBlumer:vjp



United States Department of the Interior

GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
8002 Federal Building
Salt Lake City, Utah 84138

July 30, 1976

Memorandum

To: Area Mining Supervisor, Conservation Division, Salt Lake City, Utah

From: District Chief, WRD, Salt Lake City, Utah

Subject: Environmental impact analyses/Technical examinations for coal lease continuances.

The enclosed report was compiled by Don Price of this office for use in preparing environmental impact analyses/technical examinations for four areas covered by the following coal leases being considered for continuance:

SL-070645	U-06039
SL-066116	SL-051221
U-02292	U-014275
U-02664	SL-050133

The introductory section (including figures 1-3) of the enclosed report is intended to serve as the introduction for the ground-water sections of each of the four environmental impact analyses/technical examinations planned.

Unfortunately, the expected drill-hole data and additional ground-water quality data were not available for use in compiling the enclosed report. However, I assume individual environmental impact analyses will have to be prepared for each lease area if and when mining plans are submitted to extract coal from those lease areas. By the time such plans are submitted there should be more basic ground-water data available (as well as definite mining plans) from which to compile more detailed evaluations of the ground-water resources and potential impacts on those resources by mining.

T. Arnow

Enclosure

Roger, Fred
Note ✓
ADP

Ground Water

General conditions of occurrence and chemical quality of ground water in the East Mountain area

The coal leases referred to in this report are all in the East Mountain area between Huntington and Cottonwood Creeks, Emery County, Utah (fig. 1). General conditions of ground water occurrence in that area are shown in figure 2. The source of essentially all of the ground water in transient storage in the East Mountain area is precipitation that falls on East Mountain and adjacent uplands. Most of the precipitation is consumed by evapotranspiration at or near the place of fall; some runs off in streams, and a small amount - perhaps not more than 10 percent - seeps deep enough into the rocks to become ground-water recharge. Part of the recharge enters perched aquifers and part ultimately enters aquifers in the main zone of saturation (fig. 2). Water discharging from the perched aquifers supports the flow of widely scattered upland springs and seeps such as Pine and Whetstone Springs; water discharging from aquifers in the main zone of saturation supports the base flow of Huntington and Cottonwood Creeks and their larger tributaries.

The rocks that underlie the East Mountain area consist chiefly of sandstone, shale, and associated coal beds (Spieker, 1931 and Stokes, 1964). These rocks as a whole have relatively low permeability and transmit water slowly. For example, coefficients of permeability of 13 medium-grained sandstone samples analyzed in the laboratory by the U.S. Geological Survey ranged from 0.05 to 220 gal/day/ft² (gallons per day per square foot); this is very low compared to the coefficients of permeability of 11 medium gravel

samples which ranged from 730 to 40,000 gal/day/ft² (see Morris and Johnson, 1966, pp 26 and 29). It should be noted, however, that the rocks underlying East Mountain are cut by several faults (Spieker, 1931, pl. 31), and are fractured creating zones of relatively high permeability along which significant amounts of ground water accumulate and flow. Faults are apparently the conduits along which ground water is channeled from recharge areas to the Deer Creek and Wilberg mines. As of the summer of 1976 about 200 gal/min of water was reportedly being pumped from the Deer Creek mine, and about 200 gal/min was reportedly ^{also} being pumped from the Wilberg mine (mostly from accumulations in old workings).

The chemical quality of ground water in the East Mountain area is good. According to Price and Arnow (1974, pl. 2A), the total dissolved-solids concentration of ground water in this area is less than 1,000 mg/l (milligrams per litre). More recent data indicate that much of the ground water contains less than 500 mg/l of dissolved solids. A water sample collected April 20, 1976 from the Deer Creek mine contained about 420 mg/l of dissolved solids (fig. 3). That water was found to be very hard, but none of the individual dissolved mineral constituents analyzed exceeded the maximum allowable limits recommended by the U.S. Public Health Service (1962, p. 7) for drinking water. Field tests made July 13-15, 1967 of water samples from two upland springs on East Mountain and base flow in Cottonwood Creek and Rilda Canyons indicate the dissolved-solids concentration of water from those sources ranged from about 200 to 500 mg/l. Laboratory analyses of several of those samples are forthcoming.

Ground water in the areas of coal leases

U-02292, SL-0706451, and SL-066116

The areas of the above-mentioned leases are all in the Huntington Creek drainage basin. Available data indicate that there are no geologic structures in the lease areas that ~~would~~ divert ground water from the Huntington Creek drainage basin to the Cottonwood Creek drainage basin. Therefore, it is assumed that essentially all ground water in the areas of these leases is tributary to Huntington Creek.

There are insufficient data from which to determine the depth to the regional water table in the areas of these coal leases. Therefore, it is unknown whether or not the coal beds that would be mined extend beneath the water table into the main zone of saturation. Those beds are above the water table near where they crop out in Deer Creek and Meetinghouse Canyons, but may extend beneath the water table between those canyons (where the water table is highest). Consequently some of the coal that would be mined may be in the main zone of saturation. Several faults trend from the north into the areas of these leases (Spieker, 1931, pl. 31); these fault zones may channel significant amounts of water through them toward the lease areas; this appears to be the case in the Deer Creek mine area where mine drainage is required.

The chemical quality of ground water in the areas of these leases is good. A field test July 13, 1976 of water from Whetstone Spring (fig. 1) indicated that the dissolved-solids concentration of the water is less than 200 mg/l (complete analyses not available at this writing). This probably represents the highest quality ground water in the lease areas. Water oc-

curing in the rocks that would be mined most likely would be similar in chemical quality to the water sample collected April 20, 1976 from the Deer Creek mine; that water had a dissolved-solids concentration of about 420 mg/l (see fig. 3).

Potential impacts on ground water from mining in the areas of coal leases U-02292, SL-0706451, and SL-066116

Assuming that the coal beds extend beneath the regional water table, and that faults convey water into these lease areas, mine drainage operations probably would be required. This would reduce natural ground-water discharge downgradient from the areas being mined proportionately, but no water would be lost from the Huntington Creek drainage basin. Natural ground-water discharge downgradient from the areas that would be mined is chiefly by diffuse seepage to Huntington, lower Deer Creek and Meetinghouse Canyons and evapotranspiration along the floors of these canyons.

Mining and subsequent subsidence in these areas would disrupt perched aquifers and alter local ground-water flow systems to some extent. The amount of subsidence can only be approximated from available data; and probably would be on the order of about 5 feet in areas of maximum effect. Rock fracturing associated with the subsidence would create hydrologic connection between shallow perched aquifers and progressively deeper aquifers. This would enhance recharge to the deeper aquifers by seepage from shallow aquifers, but could result in decreased flow of some high altitude springs and seeps that are fed by discharge from the shallow aquifers. The effect cannot be qualified from available data, but the impact would be small regionally.

Those springs are used by wildlife and livestock.

Mining of the coal in the areas of these leases would create a con-
Potential
dition which does not now exist for contamination of the ground water by
lubricants from mining equipment or other possible contaminants that might
be used in the mines; rock dusting in the mines could add the hardness of
the ground water. It should be noted, however, that available data indi-
cate that previous and current coal mining operations in this region (under
normal operating procedures and prescribed regulations) have not had an
adverse effect on ground water quality; nor has the mining of these low
sulfur coals resulted in acid mine drainage.

Ground water in the areas of coal lease U-07664²

Assuming that the ground water divide coincides with the surface water drainage divide in the areas of this coal lease, the ground water in the west segment of the lease is tributary to Cottonwood Creek, and ground water in the east segment is tributary to Huntington Creek. There is a slight possibility that some ground water may be diverted from the Huntington Creek drainage basin to the west segment of this lease area by the faults mapped by Spieker (1931, pl. 31).

The depth to the regional water table in this general area is not known, but is assumed to be well below the coal-bearing beds in both segments of the lease. The lease is high on a deeply dissected, well drained extension of East Mountain which receives only about 12 to 16 inches of precipitation annually - not enough precipitation for significant local ground-water recharge and water-table buildup. For these same reasons, it is also assumed that there is very little perched ground water in the areas of this lease. These assumptions are supported by reports that current workings in the old L.D.S. mines in this area are dry.

According to Price and Arnow (1974, pl. 2A) the ground water in this general area of this lease contains less than 1,000 mg/l of dissolved solid indicating that the water is fresh. However, there are no water analyses from which to determine concentrations of specific dissolved mineral constituents.

Potential impacts on ground water
from mining in coal lease U-07664²

The available data indicate that coal mining and subsequent subsidence in the two segments of this lease would have very little impact on

the ground-water resources of the area. The regional water table (and main zone of saturation) apparently is below the coalbeds that would be mined, and there is apparently little, if any, perched ground water to be affected by mining and subsequent subsidence should sufficient ground water be intercepted by mining to require mine drainage, the water most likely would be discharged in the drainage to which it is tributary. However, a mine tunnel connecting workings in the two segments of this lease would pass under the Cottonwood Creek-Huntington Creek drainage divide; this could lead to water-right problems if significant amounts of water were intercepted by the tunnel.

Mining in this lease area would create the potential which does not now exist for contamination of ground water by lubricants from mining equipment or other possible contaminants used in the mine; rock dusting in the mines could add to the hardness of ground water that might be encountered. However, available data indicate that previous and current mining operations in this region (under normal operating procedures and prescribed regulations) have not had an adverse effect on ground-water quality; nor has the mining of these low sulfur coals resulted in acid mine drainage.

Ground water in the area of coal leases

U-06039, SL-051221 and U-014275

Most of the ground water in this coal lease is tributary to Rilda Canyon Creek, a tributary of Huntington Creek; a minor amount of the ground water in the northern part of the lease probably flows to Mill Fork, also a tributary of Huntington Creek. The relation between the coalbeds and regional water table in this area is not known, but it appears highly probable that the coalbeds extend beneath the regional water table (into the main zone of saturation) in the western and northern parts of the lease area where the water table is assumed to be highest. Springs discharge near the confluence of the main canyon and south fork within the lease area (fig. 1) and have been developed for use in the city of Huntington public supply system. Field tests July 15, 1976 of seepage in the area of the spring in the main canyon indicate that the total dissolved-solids concentration of the water is less than 500 mg/l. Data were not available regarding concentrations of individual mineral constituents in the water, but the concentrations apparently meet Utah Division of Health standards as the water is used for public supply.

Potential impacts on ground water
from mining in the area of coal
leases U-06039, SL-051221 and U-014275

Mining and subsequent subsidence in the area of these leases would disrupt perched aquifers and alter the local ground water flow system to some extent. Mine drainage apparently was not required during an earlier mining operation in this area; however, extension of mine workings from the outcrop areas in Rilda Canyon to the westernmost and northernmost margins of the lease area probably would intercept significant quantities of ground water as this area receives 25 to 30 inches of precipitation annually, generating significant ground-water recharge. This indicates that mine drainage ultimately would be required. Mine drainage would not divert water from Rilda Canyon, but it would reduce natural ground-water discharge (seeps and springs and evapotranspiration) along the bottom of Rilda Canyon. This could include the springs used for the city of Huntington public water supply. Mining of the coal in this lease area, therefore, doubtless would create water-right problems with regard to those springs.

Ground water in the northern part of this lease area is apparently tributary to Mill Fork, consequently mining, with possible mine drainage, activities in this part of the lease could divert some ground water from the Mill Fork drainage resulting in additional water-right problems.

Rock fracturing associated with subsidence would cause water to seep from shallow perched aquifers to progressively deeper aquifers although this would not result in a loss of water from the ground-water system (it could actually enhance recharge), it might reduce the flow of some upland springs and seeps that discharge from the shallowest aquifers. *Those Springs are used by wild life and livestock.*

Mining of the coal under normal operating conditions and prescribed regulations would have little adverse impact on the chemical quality of the ground water. It should be noted, however, that because ground water in this lease area has been developed for public supply introduction of even very small amounts of contaminants such as lubricants from mining equipment into the ground water could be considered a serious impact. It is unlikely that mining of these low sulfur coals would result in acid mine drainage.

Ground water in the area of coal lease SL-050133

Ground water in the area of this coal lease is tributary to Huntington Creek. The depths to the regional water table is unknown but apparently is well below the coalbeds that would be mined. This is a high, well drained area where there is insufficient precipitation (normal annual precipitation is less than 16 inches) for significant ground-water recharge and water-table buildup. For these same reasons it is unlikely that there is significant quantities of perched ground water in the lease area. The nearby old L.D.S. Church mines which are operated under similar conditions in this area are reported to be dry.

According to Price and Arnow (1974, pl. 2A) the ground water, where present, in this area contains less than 1,000 mg/l of dissolved solids. There are no analyses from which to determine the concentration of individual mineral constituents in the ground water or the suitability of the water for various uses.

Potential impacts of mining in the area of
coal lease SL-050133

Because of the apparent scarcity or lack of ground water in the area that would be affected by mining in this lease area, impacts on the ground water supply and quality would be negligible. Should sufficient water be intercepted by mine workings to require mine drainage, the water would be discharged into the drainage basin to which it is tributary and little if any water would be lost from the ground-water system. There would be a proportionate reduction of natural ground-water discharge downgradient from the lease area. This discharge appears to be chiefly evapotranspiration by relatively nonbeneficial vegetation.

Rock dusting in the mine workings could increase the hardness of ground water encountered, and there could be some addition of lubricants from mine equipment into the ground water, but the effects on the water quality would be negligible. Mining of these low sulfur coals, even if water were encountered by mine workings, most likely would not result in acid mine drainage.

FIGURE 6

Annual floods on WATERSHED I

Drainage area, 4.8 sq mi Period, MEAN ELEVATION 8500

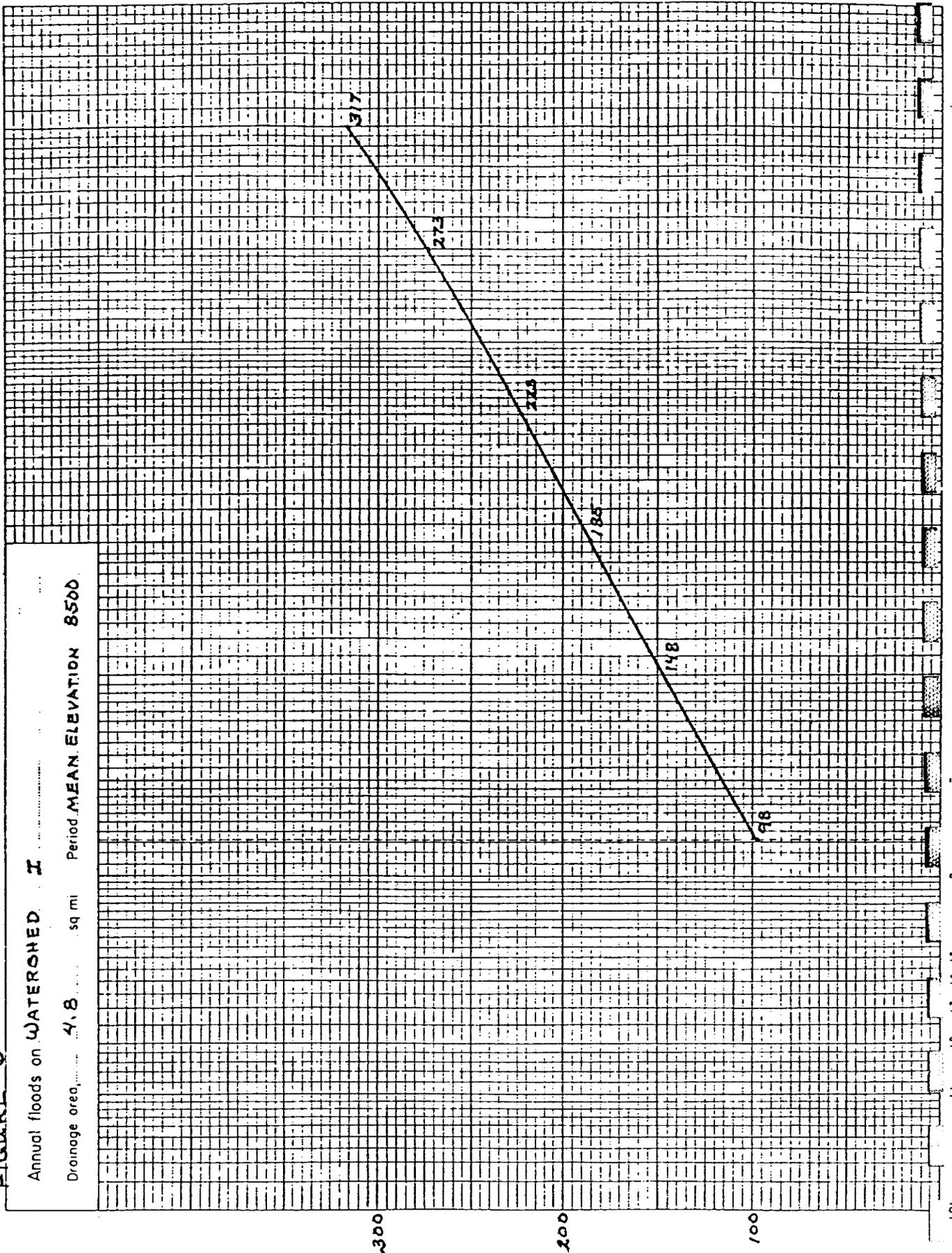
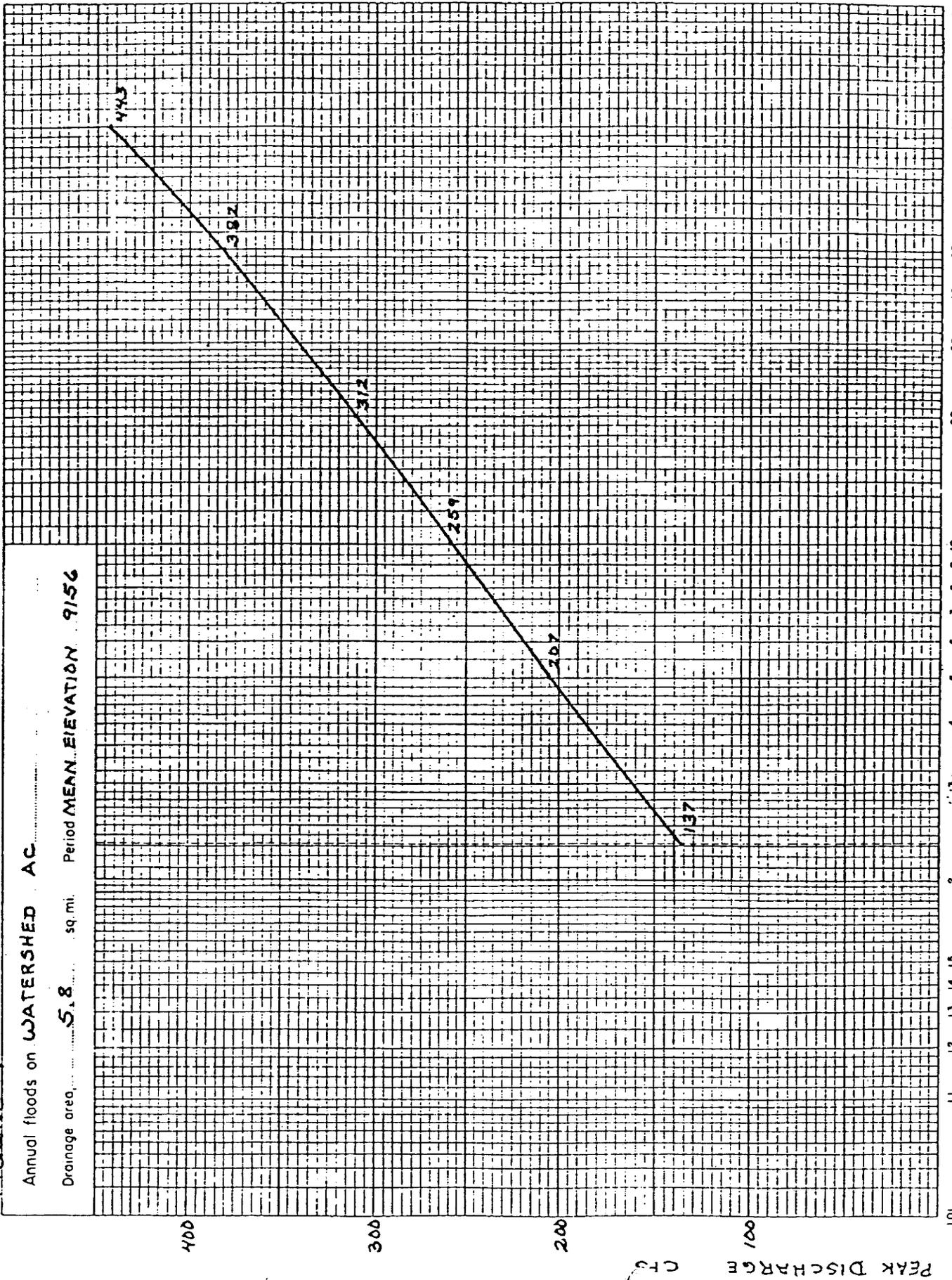


FIGURE 7

Annual floods on WATERSHED AC

Drainage area, 5.8 sq. mi.

Period MEAN ELEVATION 9156



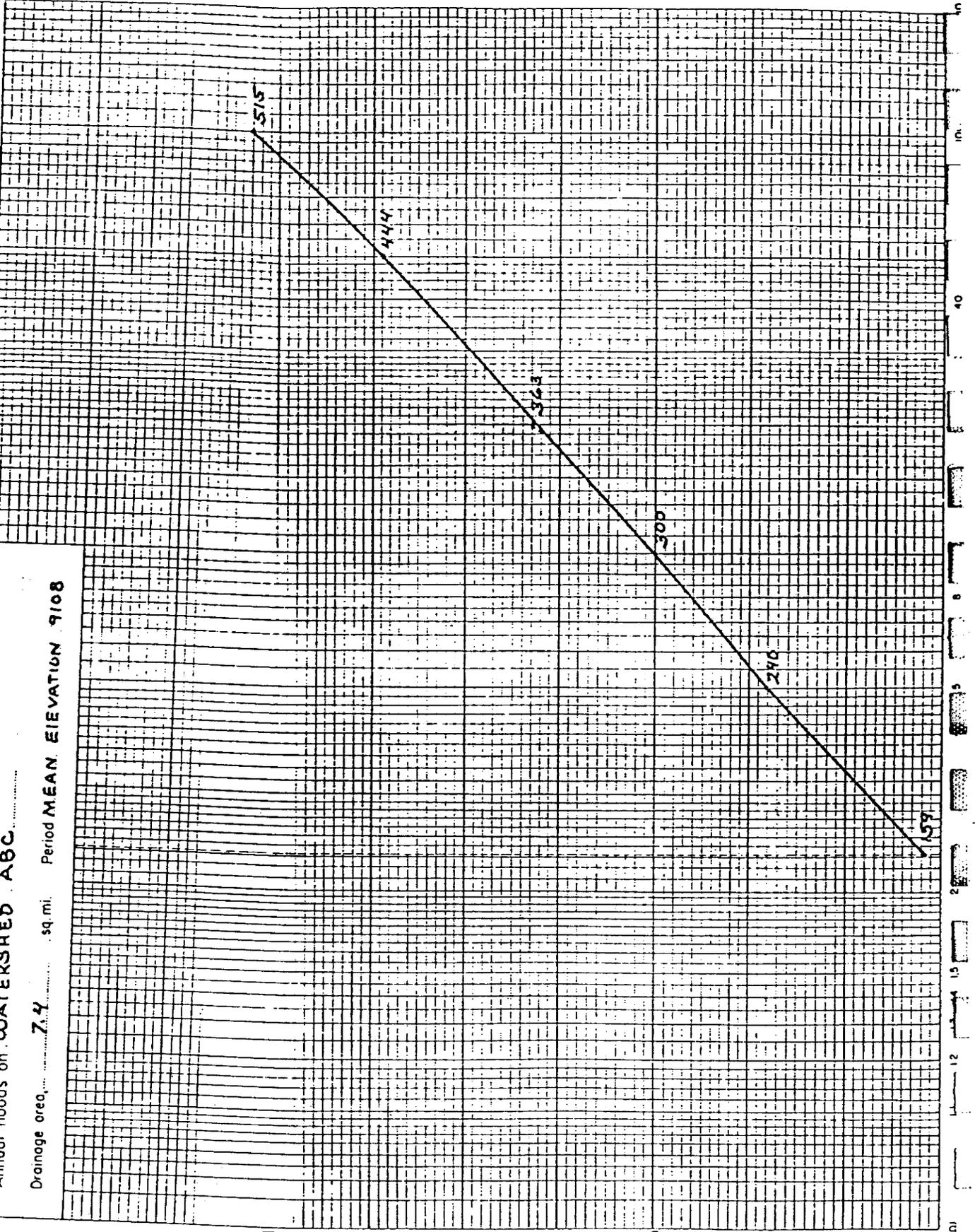
101 11 12 13 14 15 2 3 4 5 6 7 8 9 10 20 30 40 50 100 200

FIGURE 8

Annual floods on WATERSHED ABC

Drainage area, 7.4 sq. mi.

Period MEAN ELEVATION 9108

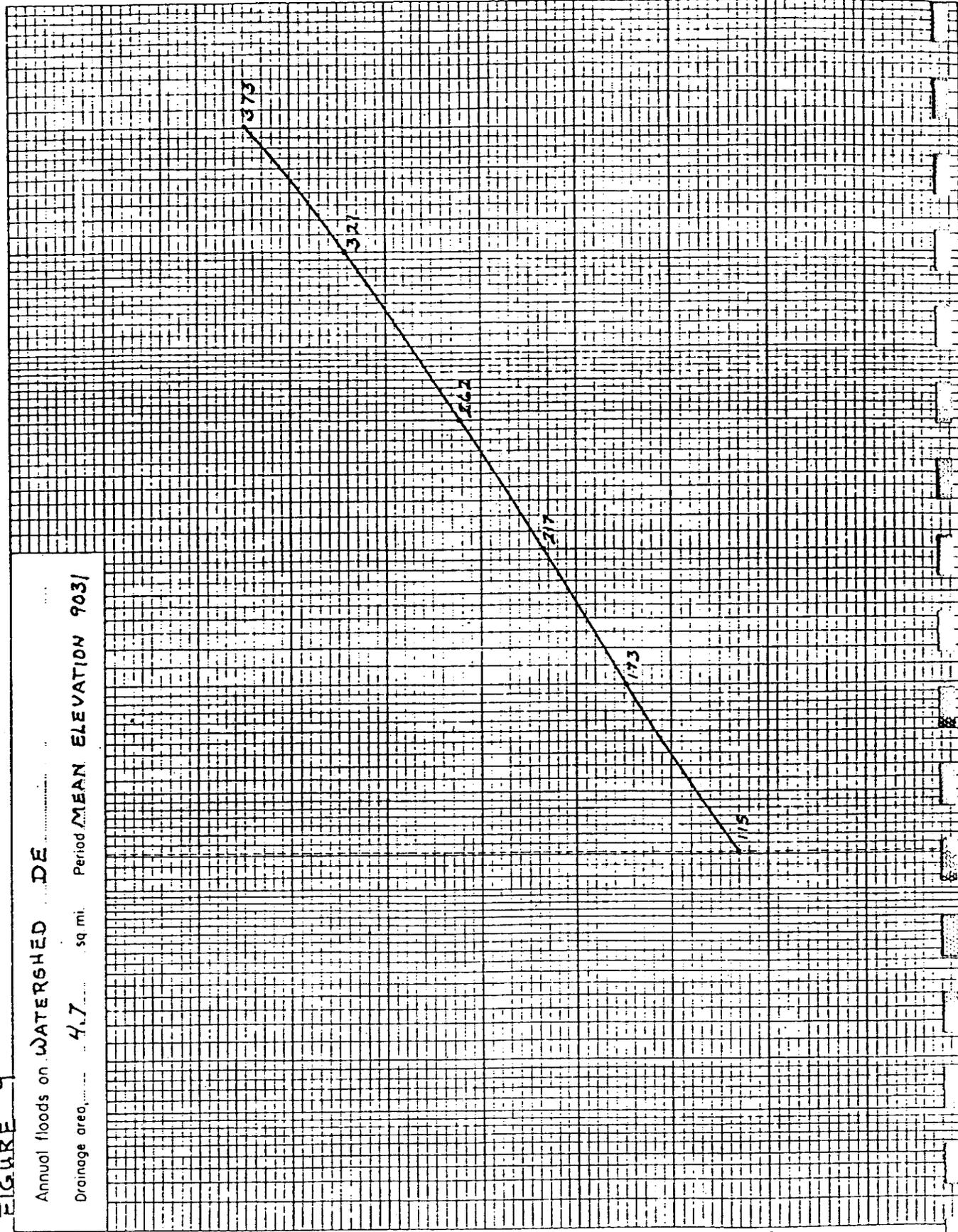


PEAK DISCHARGE
CFS

Time

FIGURE 9

Annual floods on WATERSHED DE
Drainage area, 4.7 sq mi. Period MEAN ELEVATION 903'

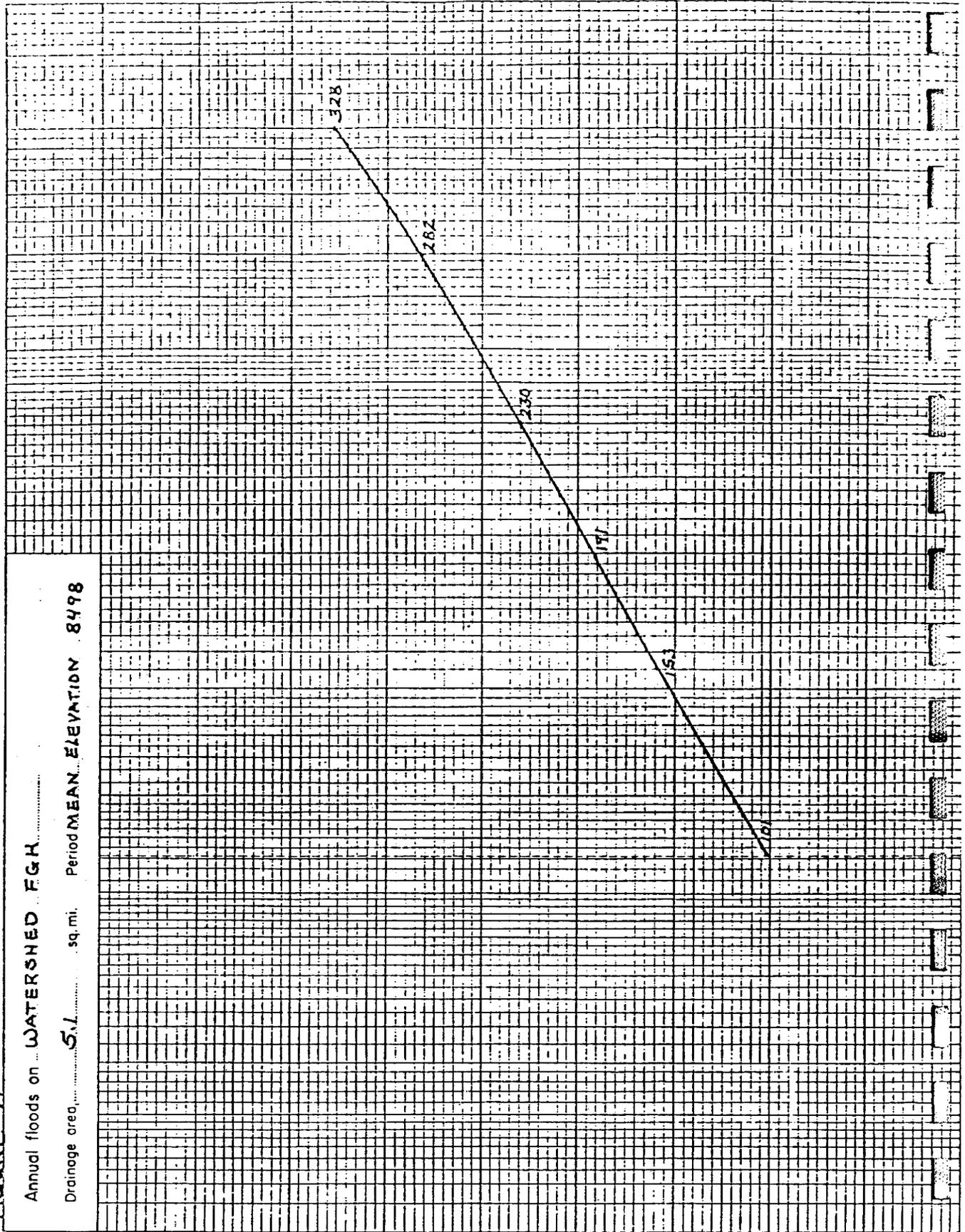


PEAK DISCHARGE

()

300
200
100

FIGURE 11



MARCH 1949

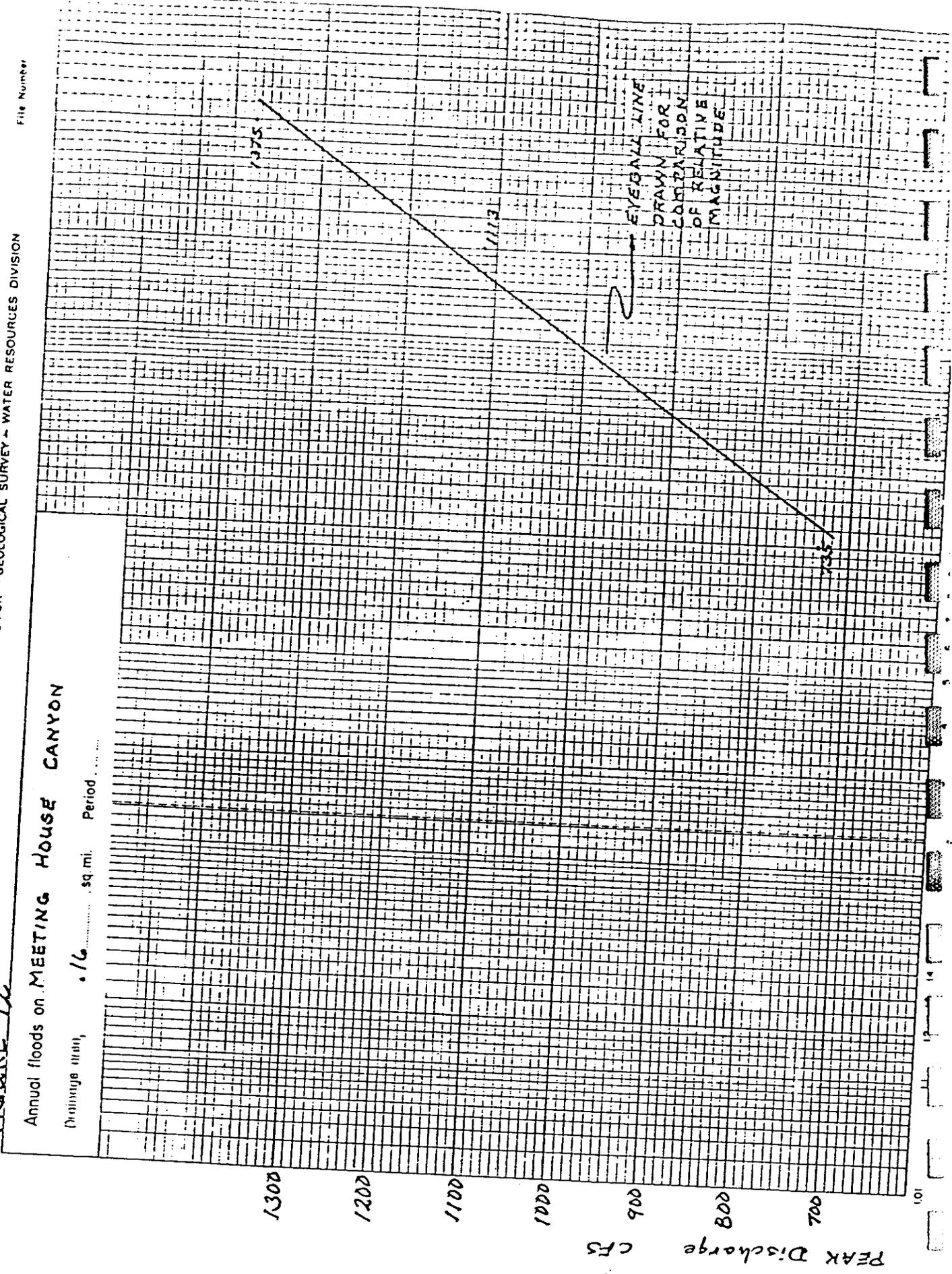
UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

File Number

FIGURE 12

Annual floods on MEETING HOUSE CANYON

Drainage area, .16 sq. mi. Period



PEAK Discharge CFS

101

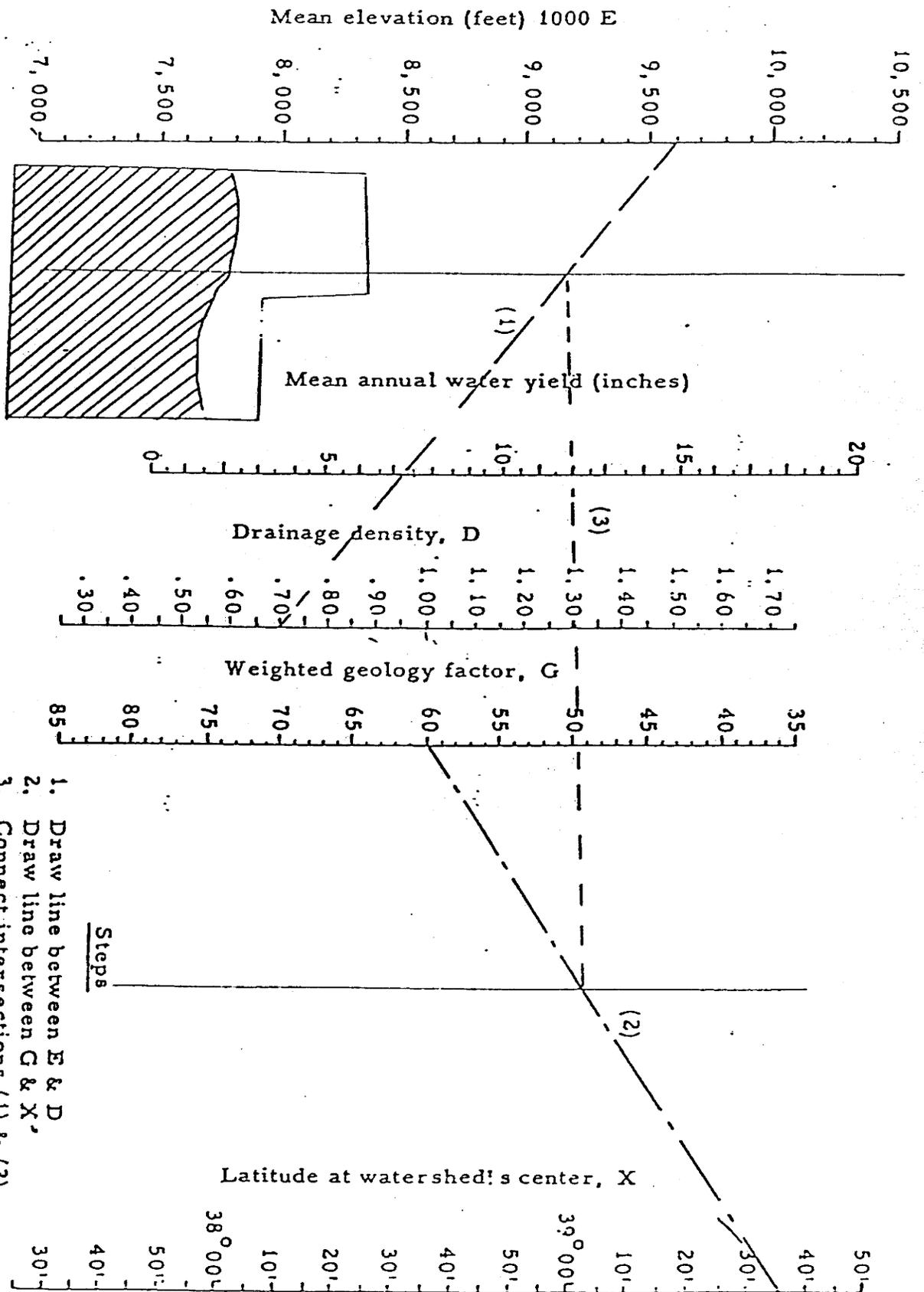


Fig. 13. Nomogram for the determination of mean annual runoff based on equation 68

1. Draw line between E & D
2. Draw line between G & X
3. Connect intersections (1) & (2)
4. Read Y

FIGURE 13

FIGURE 14
STREAM CHANNEL CONDITION

Date: _____ Average Condition: _____
 Channel Name: _____ Examiner: _____
 Location: _____ Length of Reach _____

INDICATOR	CLASS I	CLASS II	CLASS III
1. Channel Side Vegetation	Well Vegetated (2)	Partially (4)	Very Little
2. Slumping of Channel	None (2)	Only at Bends & Constrictions (4)	Excessive (6)
3. Cutting or Deposition of Channel Bottom	Very Little (2)	Only at Bends & Constrictions (4)	Common (6)
4. Aquatic Vegetation	On Sides & Bottom (1)	Scattered (2)	None (3)
5. Algae	On Rocks (1)	On Stable Bottom Areas (2)	None (3)
6. Cutting or Deposition Along Channel Sides	Very Little (2)	Only at Bends & Constrictions (4)	Excessive (6)

Stream Gradient: _____ % ~~Water Temperature: _____~~
 Sinuosity Ratio: _____
 Valley Type: _____ Photo Number: _____
 Resource Use: _____ Channel Material Rating: _____
 Bank Material: _____ Stream Bottom Material: _____
 Stream Zone Landform & Topography: _____ Erosion Class: _____
 Stream Activity (Circle) Degrading Aggrading Graded Meander.
 Notes and Comments: _____

Draw "Valley" Bottom Cross Section on Back, give dimensions, roughness coefficient, area of max. flow.

Table 6

Summary of Stream Channel Conditions

<u>Stream</u>	<u>Length (Miles)</u>	<u>Condition Score</u>	<u>Condition Rating</u>
<u>Rilda</u>			
Reach A	2.4	26	Poor
" B	3.0	20	Fair
" C	2.0	16	Good
<u>Meetinghouse</u>			
Reach A	0.8	26	Poor
" B	0.5	26	Poor
" C	0.9	16	Good
" G	1.6	14	Good
" H	0.7	17	Good
" I	1.0	16	Good
" J-K	4.3	10	Excellent
<u>Deer Creek</u>			
Reach A	1.9	28	Very Poor
" B	0.4	10	Excellent
" C	1.0	26	Poor
" D	1.9	24	Poor
" E	0.6	16	Good
" F	0.7	16	Good
<u>Grimes Wash</u>			
Reach A	0.9	26	Poor
" B	1.6	16	Good
" C	1.1	26	Poor
" D	1.4	26	Poor

Area Summary

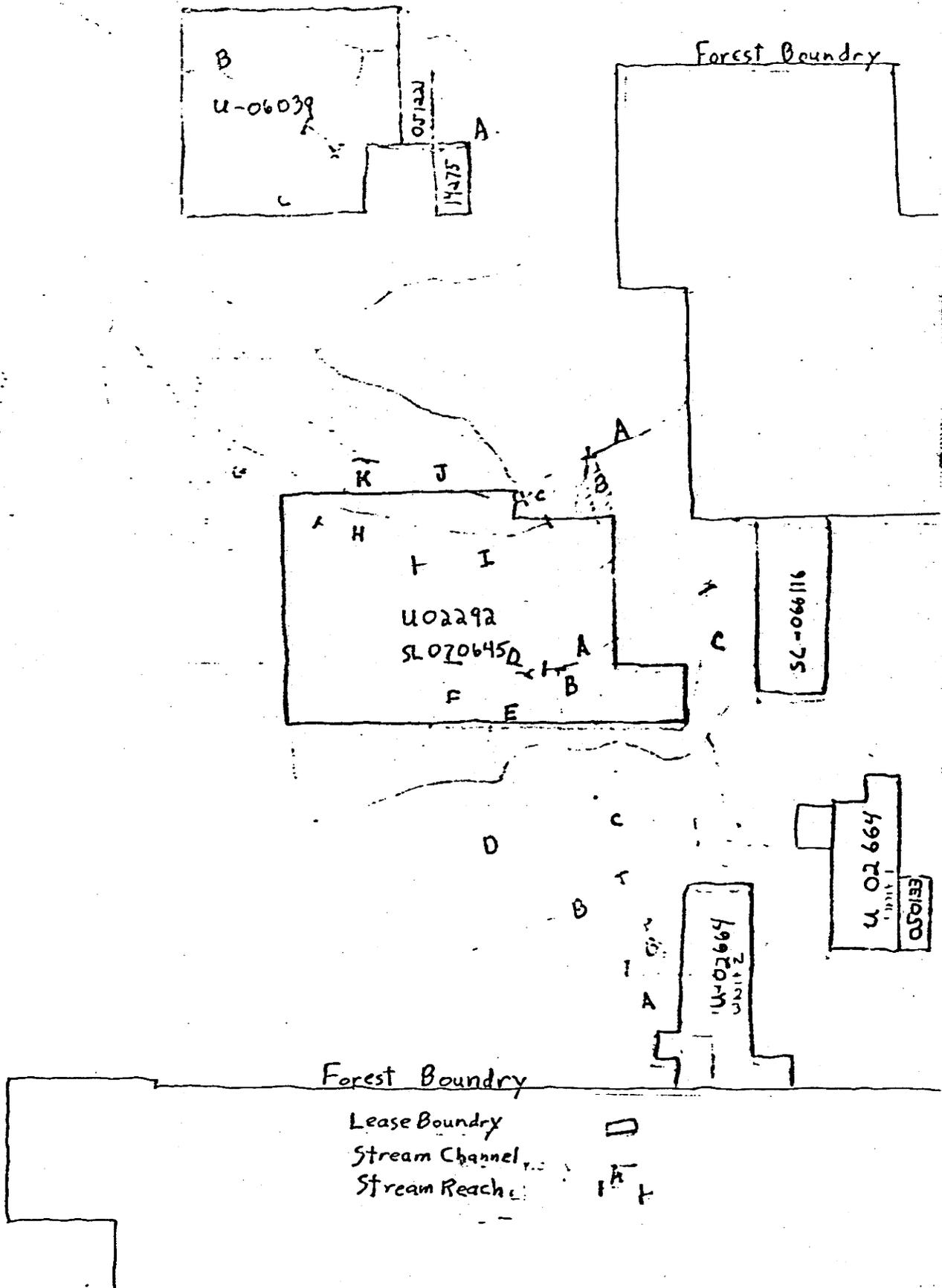
<u>Channel Condition</u>	<u>Miles of Stream Channel</u>
Excellent	4.7
Good	9.1
Fair	3.0
Poor	10.0
Very Poor	1.9
Total	28.7

Scoring System

10-13	=	Excellent
14-17	=	Good
18-22	=	Fair
23-26	=	Poor
27-30	=	Very Poor

MAPS

MAP 3

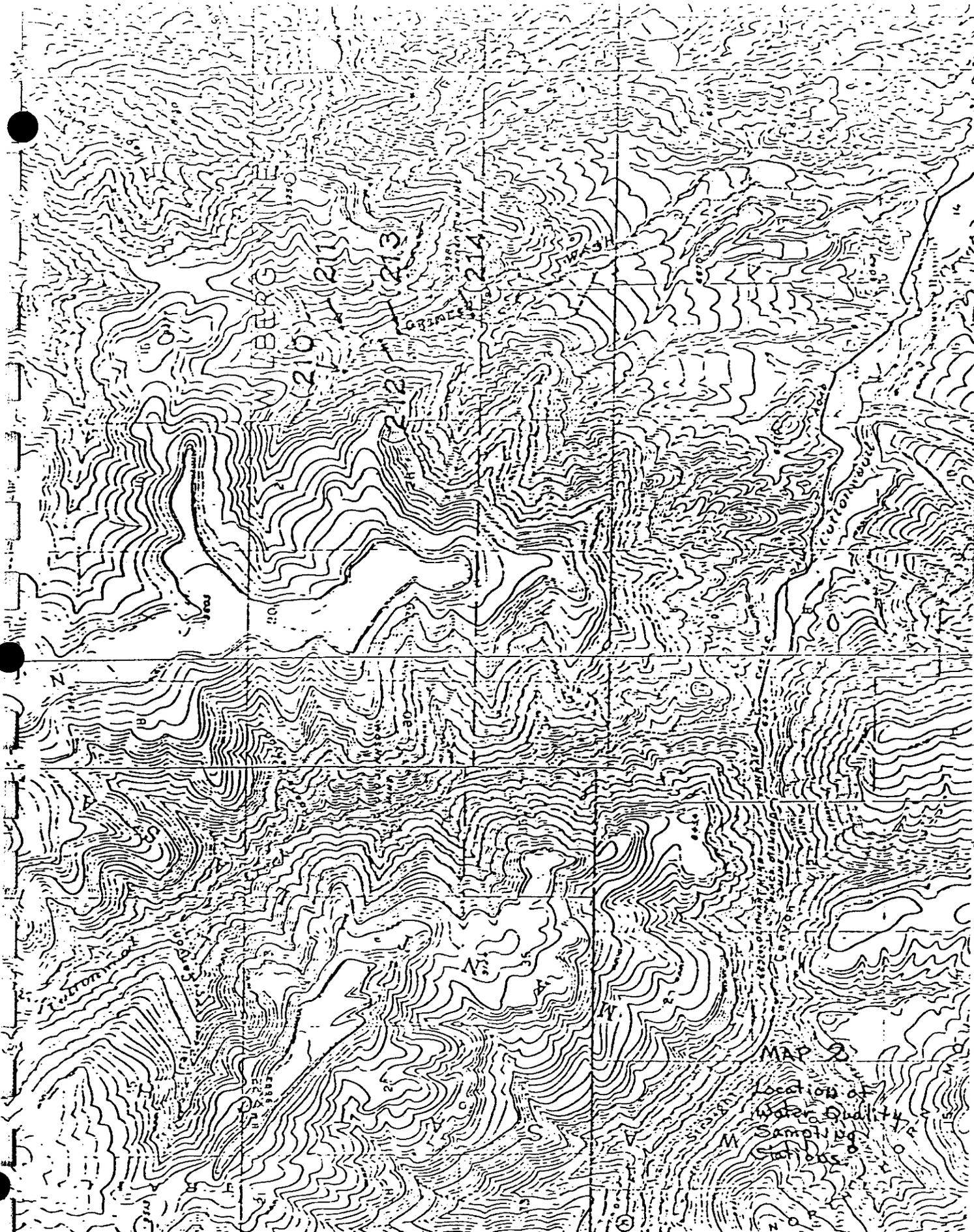


Lease Boundry

Stream Channel

Stream Reach





(Jock Valley Reser-)
1:25,000

PROVED BY U.S. GEOLOGICAL SURVEY
WASHINGTON, D.C. 20508

1:25,000
1:25,000

T. 18 S.

MAP 2
Location of
Water Sampling
Stations
M



United States Department of the Interior

GEOLOGICAL SURVEY

SL-051221
U-06039
U-014275

Office of the Area Mining Supervisor
Conservation Division
8426 Federal Building
125 South State Street
Salt Lake City, Utah 84138

September 13, 1976

Memorandum

To: Mr. Reed Christensen, Forest Supervisor, U. S. Forest Service, Price, Utah

From: Mining Engineer

Subject: Technical Examination for Coal Lease Readjustment of Terms for Continuance of Coal Leases SL-051221, U-06039, and U-014275, Peabody Coal Company

The subject technical examination was made as requested by your Forest Engineer, Bill Boley. On July 14, 1976, the writer, accompanied by personnel from your office, and James Travis, Deputy Area Mining Supervisor from this office, made an onsite inspection of the surface of the Peabody Coal Company leases SL-051221, U-06039, and U-014275.

This memorandum will follow the format of the BLM technical examination checklist, Form 3040-3, as it involves the U. S. Geological Survey. Lease SL-051221 became due for continuance and adjustment of terms on November 5, 1974. Lease U-014275 became due for continuance and adjustment of terms on October 1, 1975, and lease U-06039 became due for continuance and adjustment of terms on May 1, 1973.

I. Background

Lease SL-051221, currently held by Peabody Coal Company, is located on the $W\frac{1}{2}NW\frac{1}{4}$ of sec. 28, T. 16 S., R. 7 E., 11M, Emery County, Utah, and consists of 80 acres.

The above acreage was initially leased to Rulon W. Jeppson on November 5, 1934. The lease then changed hands a number of times as follows:

Assignments

<u>From</u>	<u>To</u>	<u>Date</u>
Rulon W. Jeppson	Comfort Coal Co.	March 1940
Comfort Coal Co.	William Smith	March 1944
William Smith	F. F. Hintze then to Utah Coking Coal, Inc.	Dec. 1953
Utah Coking Coal, Inc.	Rilda Corp.	Aug. 1965
Rilda Corp.	Peabody Coal Co.	July 1971

Lease U-014275, currently held by Peabody Coal Company, is located on the E $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 28, T. 16 S., R. 7 E., SLM, Emery County, Utah, and consists of 80 acres.

The above acreage was initially leased to John Helco on October 1, 1955. The lease was then assigned to Ura Swisher on July 1, 1967. It was then assigned to Peabody Coal Company on January 1, 1973.

Lease U-06039, also currently held by Peabody Coal Company, is located on SE $\frac{1}{4}$ sec. 19, S $\frac{1}{2}$ sec. 20, sec. 29, and E $\frac{1}{2}$ sec. 30, T. 16 S., R. 7 E., SLM, Emery County, Utah, and consists of 1,440 acres.

The above acreage was initially leased to Ferdinand F. Hintze on May 1, 1953. It changed hands a number of times. In December 7, 1953, it was assigned to Utah Coking Coal, Inc.; on August 4, 1965, it was assigned to Rilda Corporation; and finally it was assigned to Peabody Coal Company on February 1972.

A partial assignment of 80 acres of the above 1,440 acres to Malcolm N. McKimmon took place on November 1, 1973. The location of the 80 acres is in the E $\frac{1}{2}$ SE $\frac{1}{4}$, sec. 29, T. 16 S., R. 7 E., SLM, Emery County, Utah. The description of the 80 acres is under U-24069.

The above mentioned leases are located about 11 miles northwest of Huntington, Utah, in Rilda Canyon, a tributary to Huntington Canyon. The same minable coal seams are present on all these leases. From our information on surrounding mines, we can assume that the coal seam thicknesses are fairly consistent throughout the area. From this we are assuming that the Hiawatha coal seam runs about 8 to 12 feet thick with a heating value of approximately

12,600 Btu's and a sulfur content of .5 percent, and the Blind Canyon coal seam, which is about 90 feet higher stratigraphically than the Hiawatha; has an approximate thickness of 8 to 10 feet with a heating value of about 13,000 Btu's and a sulfur content of .6 percent.

At the present, there are no active coal mines on the three leases. The Smith mines operated on lease SL-051221 from January 1935 to September 1950. The coal was mined in the Hiawatha coal seam with a total production of about 46,300 tons.

Lease U-06039 has not been mined. The Helco mine on lease U-014275 had been mined in the Hiawatha coal seam from April 1959 to April 1965 with an approximate extraction of 5,600 tons of coal.

Mine portals and surface facilities for the Smith mine are on the same lease as the mine SL-051221. Mine portals and surface facilities for the Helco mine on U-014275 are on SL-050862 which is held by McKimmon.

Our office has received no mine plans for any renewed operations in Rilda Canyon. It can be assumed that these holdings are being held in reserve by Peabody. At the moment, it appears that Utah Power & Light Company is in the process of acquiring all of Peabody's operations in Utah. Utah Power & Light Company has a number of operating coal burning powerplants in this region and new plants are in the planning. If the acquisition of Peabody by Utah Power & Light comes through, it would be a pretty good guess that the coal would be used in the nearby powerplants.

Peabody currently has a mine in Deer Creek Canyon which is adjacent to Rilda Canyon. It would be possible to mine the Rilda Canyon leases from their Deer Creek mine, but this would result in long underground coal haulage and difficult ventilation. From this, we assume that any development of these leases would be from Rilda Canyon. There is an estimated 40 million tons of coal in the two seams on the subject leases. With these reserves, a sizeable operation would be possible from Rilda Canyon.

(1) Exploration Operations

Peabody is considering conducting more development drilling in and around the Deer Creek operations. From these operations, and probable exploration in Rilda Canyon, the limits of the coal should be accurately defined. Our office has received no such exploration plans for Rilda Canyon, but it can be assumed that surface exploration would probably continue for the life of the mine and will generally precede the actual start of the mining to determine the nature of

the overlying strata, depth and thickness of the coal deposit, grade of coal, and often the quantity and quality of ground water. Development drilling is accomplished by truck-mounted drill rigs. Additional equipment used by a development drilling crew includes water trucks, personnel carriers, a hole logging equipment truck, and a dozer or blade to assist in obtaining access to the exploration area and drill site. Development drilling will require construction of access roads for equipment, drill pads to accommodate the drill rig, and other equipment and mud pits to hold drill cutting and mud. The time required to drill the holes will vary from several days to several weeks. The exploration crews will vary from 12 to 50 people depending on the intensity of exploration.

Drill site preparation will require the leveling of an area approximately 75 x 100 feet. A mud pit will be constructed at each site to collect return water and drill cuttings. The pit will be approximately 12 x 25 feet and 4 feet deep. Mud additives or foam agents are sometime used. Both materials are biodegradable. Roads are anticipated to be approximately 15 feet in width depending on topography and other site conditions.

Activity within the area of the drill rigs and along the access roads will be constant, and noise and dust will be created during the drilling operations. Changing of crews and the hauling of water to supply the rig will generate a substantial amount of traffic to and from the rigs.

Prior to abandonment, drill holes are cemented to a minimum of 50 feet above and below the coal seams as well as any water aquifers. Holes must be plugged to a depth of 5 feet below collar with a suitable plug and cement. All mud pits will be filled and the drill sites will be leveled and seeded upon completion of the holes.

(2) Underground Operations

As mentioned previously, there are no active mines on these leases. The Smith mine has not been mined since 1950, and the Helco mine has not been mined since 1965. It can be assumed that these old mine portals are probably in pretty bad shape, and rather than rehabilitate them, new entries would be made.

Presently, in surrounding operations, 5 to 7 parallel entries are driven from the surface in the coal seam. These are used for ventilation and conveyor belt or rail haulage.

Four mining methods can be anticipated to be employed in the coal mining operation, depending on the conditions and nature of the

coal seam. These methods include: conventional and continuous room and pillar, longwall, and shortwall mining.

Multiple seam mining can be expected to occur over a large portion on these three leases. Planned multiple seam mining will require the uppermost seam to be mined first to avoid hazardous caving and subsidence below other minable coal seams or active workings.

In both conventional and continuous room and pillar mining, part of the coal bed is removed by drilling parallel excavations or rooms. The coal remaining between the rooms becomes the pillar, which is pierced at certain intervals by breakthroughs or "crosscuts" to provide passageways for ventilation.

In conventional room and pillar mining, openings are developed in a uniform pattern within a panel or block of coal. Remaining columns of coal or pillars are left standing for support of the overlying strata. The coal is either cut or blasted from the coal face. The broken coal is then gathered by a loading machine which transfers it onto a shuttle car for transportation to a nearby conveyor belt. Continuous room and pillar mining is identical to conventional room and pillar mining except the mining is performed by a single machine, the "continuous mining machine." The continuous miner rips the coal loose from the coal face with mechanical cutters and loads the broken material directly into a conveyor belt or shuttle car. After the coal is removed, the roof is supported by either timber or steel supports, or more commonly "roof bolts," which bind the overlying roof into a "continuous beam." The pillars may be "pulled" or mined upon completion of mining and the roof allowed to cave. Longwall mining is a continuous full extraction mining method. The coal is mined in a single cut, no pillars are left, except the chain pillars from panel development, and the overlying strata is permitted or induced to cave once mining is completed. This mining method is particularly applicable when the coal bed is of uniform thickness, contains no hard partings which cannot be readily broken by mechanical means, and when roof support or control is very difficult.

The longwall machinery, consisting of a combination coal shear and plow, which rips the coal from the face in a continuous sweep varying from 2,500 - 7,500 feet long, a chain-type conveyor, and a set of hydraulically operated self-advancing roof supports, are installed along the face of the coal being mined. A conveyor belt is used to deliver the coal from the mine area. Caving of the unsupported roof behind the chocks follows virtually unhampered and with a high degree of safety to miners who remain under the canopy of supports.

Shortwall mining is a combination of the continuous mining and the longwall methods. Shortwall mining, as the name implies, is used on smaller coal blocks than longwall mining. The principles of roof support and post mining caving are the same as in longwall mining. Actual mining is accomplished by utilizing continuous mining machines and shuttle cars in place of the coal shear and plow and the chain type conveyor.

In areas where the thickness of the coal is nonuniform, longwall or shortwall methods lose their advantage, and room and pillar methods are employed. Where possible, maximum extraction mining methods such as "longwall," or continuous room and pillar with pillar extraction could be used. It is anticipated that most of the mining will be accomplished employing a combination of these methods.

Continuous room and pillar mining should be able to extract 40 to 60 percent of the coal. With longwall or shortwall, around 70 percent extraction could be expected.

Maximum extraction could result in surface subsidence over the long term. The depth from the surface to the coal varies, but it will be in a range from 300-2,000 feet. With multiple seam mining, in all probability, some surface subsidence would occur. It will depend not only on the distance from the seams to the surface, but also on the amount of coal removed under the methods of mining, and the stratigraphy of the formations above the coal seams. Broken rock occupies a larger volume of space than unbroken rock. The fractures associated with the caving will propagate upward until the void left after coal extraction is filled with broken rock. The amount of rock above the seam that will be fractured depends on the depth of the seams, the volume of coal removed, and the nature of the overburden. If conditions are unfavorable, then the fractures will eventually extend to the surface, causing differential subsidence. Partial extraction methods such as conventional or continuous room and pillar without pillar extraction mining methods would reduce or eliminate surface subsidence. Partial extraction would recover no more than 40 percent of the total in-place coal, and is less desirable from a standpoint of maximum resource recovery.

Subsidence plays a major role in coal mining activities and in the future use of the land surface above the mine workings. Stresses and deformation produced in mine workings, other coalbeds, bedrock, and at the ground surface by the processes of subsidence significantly affect mine safety, extraction efficiency, and also the surface environment.

Curved like a bow, zones of compressive stress called compression arches, tend to occur above and below the mine panels and transfer the overburden load in coal extraction areas to adjacent solid coal boundaries or barrier pillars. The caving and flexure of strata in the distressed zone encompassed by the arches into the mine cavities tend to increase the stresses again in the mine workings. Flexure of strata also produced tensile and compressive stresses within lithologic units and shear stresses across lithologic boundaries. As time goes by, the mine voids are widened, the compression arches migrate higher in the overlying strata and eventually may reach the surface. This migration continues to transfer overburden stresses back into the extraction area from the mine boundaries or barriers. The rate of migration of compression arches and consequently the rate of stress transfer, depends on thickness and strength of overburden strata, duration and rate of mining, mine geometry, and mining sequence.

Subsidence can be expected. A good rule of thumb is to expect a subsidence factor of up to 70 percent of the mining height if maximum recovery of the coal is obtained. Subsidence should not effect the present land use (grazing) to any great extent nor will it change significantly the drainage pattern.

Subsidence could cause some effect on surface springs and the natural ground water flow in the proposed coal-mining area as water bearing formations would be affected. However, little, if any, water would be lost from the ground water system.

Peabody's mine in Deer Creek Canyon has pumped up to 300,000 gallons of water per day from its mine. It can be assumed that any mine in Rilda Canyon would also produce water due to its close proximity stratigraphically to Deer Creek.

Water sprays on the mining machinery would use some of this water, but a considered amount would probably have to be discharged.

The mine water is subject to contamination during the mining of coal. Oil and grease from the mining machinery contaminates the mine water. Also, the water pumped from the mine picks up suspended sediments. Peabody presently skims the oil from the mine water before it is discharged into a water reservoir at Utah Power & Light's Huntington powerplant. Peabody Coal Company has a water discharge permit from EPA and the State of Utah. The water must meet Class C standards for discharge.

II. Resource Values for Nonmineral Environmental

This section to come under the Forest Service jurisdiction.

III. Public Health and Safety

Toxic Materials

The coal is low in sulfur, about .5 percent, and water discharges should be no different from that presently involved in other mines operating in the near vicinity. On April 26, 1976, it was reported that a water analysis was made at Deer Creek mine giving an average pH of the mine water as 7.4 by the USGS Water Resources Division. Oil and suspended solids will exist in the mine discharge and must be removed prior to discharge into any stream or drainage.

Fire Hazards

There should be no abnormal fire hazards as a result of drilling exploration or mining. The surface structures are generally constructed of fireproof materials and also equipped with proper fire extinguishers. The overall operations are subject to both State and Federal coal mining regulations which guard against fires.

Landslide Potential

The possibility of landslides may exist around the portals of the Smith and Helco mines. Subsidence of the canyon walls may cause landslides. For this reason, pulling pillars is not recommended in areas where mining nears the surface. Sufficient support should be left in place to support the overlying strata.

Hazardous Exploration or Mine Workings

The Helco mine has been abandoned since 1965, and it can be assumed that the old mine workings may be unstable. The mine and fan portals of this mine have not been properly abandoned, and could be considered dangerous to anybody entering into these workings. The Smith mine portals have caved open and could be dangerous to anyone attempting to enter or investigate too closely.

Dust

Dust is generated in underground mining but it is greatly minimized by adherence to regulations initiated by both Federal and State agencies. Surface dust in the mine yard and on adjacent access roads is also present but is localized. Dust suppression by sprinkling, surfacing, or etc., is usually required.

Flooding

No activities contemplated would cause flooding. If underground waters are encountered, some could be utilized in the lessee's operations with excess amounts pumped to the surface for disposal under approved permits. Mining operations should not materially effect present surface water patterns or drainages.

Waste Disposal

All waste material encountered in mining operations would be disposed of in controlled surface waste areas, and such areas must be adequately rehabilitated at termination of the mining. Disposal will be under an approved reclamation plan.

IV. Socio-Economic Considerations

Present and Projected Demand for Coal

There are presently no coal mining operations taking place on the leases. A future sale of these leases by Peabody to Utah Power & Light is possible with the coal reserves from these leases being used to supply Utah Power & Light Company's Gadsby, Huntington, and Emery powerplants.

Effects on Local Economy and Employment

Start-up of any mining operations on these leases would require an increase in employment or would mean the prolonging of employment in the area. The money generated would enhance the Emery County tax base and would certainly improve local economy.

Impact on Other Resource Values (Temporary or Permanent)

The major irreversible impact on topography and geology of the area from coal mining would be the possibility of subsidence and removal of coal.

Useable aquifers could be cut and such groundwater supplies be altered during the mining operations and subsequent to same.

No major impacts to vegetation or wildlife are expected, and the current surface use should not be affected.

V. Environmental Considerations and Reclamation Requirements

It is felt that the lessee is very responsible and would readily acquiesce to any requirements for rehabilitation or reclamation as required.

T. 16 S., R. 7 E., SLM

EMERY COUNTY

SL-051221



PEABODY

U-06039



PEABODY

U-014275

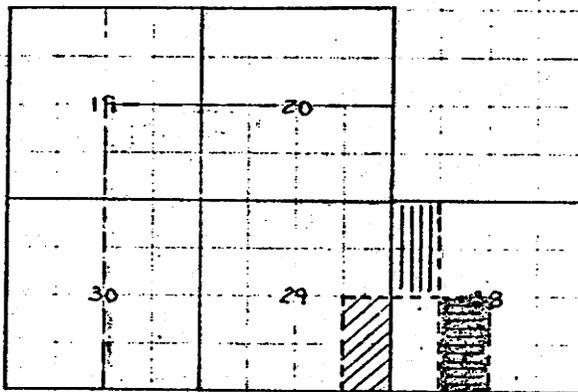


PEABODY

U-24069



MCKINNON



Bonding Requirements

There presently exists a nationwide surety bond in the principal amount of \$75,000 which is considered sufficient for current operations. If additional bond is deemed necessary, in the future, such coverage can and will be recommended.

Ralph J. Blumer

cc: Denver

Rogers M. Thomas - U.S. Forest Service, Price, Utah ✓

RJBlumer:vjp

T. 16 S., R. 7 E., SLM

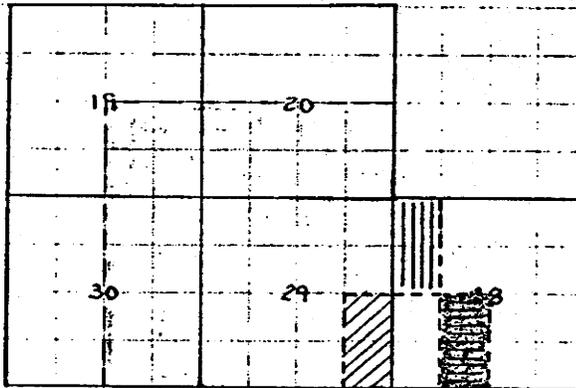
EMERY COUNTY

SL-051221  PEABODY

U-06039  PEABODY

U-014275  PEABODY

U-24069  MCKINNON



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Figure 1.-- Locations of the coal lease areas referred to in this report, and locations of known springs.

GEOLOGICAL SURVEY
CENTRAL LABORATORY, SALT LAKE CITY, UTAH

WATER QUALITY ANALYSIS
LAB ID # 112046 RECORD # 10802

SAMPLE LOCATION: DEER CREEK MINE DC 1 D17 710CBA
 STATION ID: 392130111074501 LAT.LONG.SEQ.: 392130 1110745 01
 DATE OF COLLECTION: BEGIN--760420 END-- TIME--0825
 COUNTY CODE: 015 PROJECT IDENTIFICATION: 4649115
 DATA TYPE: 2 SOURCE: GROUND WATER GEOLOGIC UNIT:
 COMMENTS:
 SAMPLE COLL BY UTAH POWER & LIGHT CO

Ca, TOT (AS CaCO3)	MG/L	290	PHOS ORTHO DIS AS P	MG/L	0.01
CARBONATE	MG/L	354	PHOSPHATE DIS ORTHO	MG/L	0.03
CHLORIDE DISS	MG/L	77	POTASSIUM DISS	MG/L	2.5
CHLORIDE DISS	MG/L	7.9	SAR		0.4
HARDNESS NONCARB	MG/L	83	SODIUM DISS	MG/L	18
HARDNESS TOTAL	MG/L	370	SODIUM PERCENT		9
MAGNESIUM DISS	MG/L	44	SP. CONDUCTANCE LAB		733
NITROGEN AS N DISS	MG/L	0.03	SULFATE DISS	MG/L	100

CATIONS

	(MG/L)	(MEQ/L)		(MG/L)	(MEQ/L)
CALCIUM DISS	77	3.843	BICARBONATE	354	5.803
SODIUM DISS	44	3.620	CHLORIDE DISS	7.9	0.223
POTASSIUM DISS	2.5	0.064	SULFATE DISS	100	2.082
MAGNESIUM DISS	18	0.783	NO2+NO3 AS N D	0.03	0.003
TOTAL		8.309			

ANIONS

	(MG/L)	(MEQ/L)
BICARBONATE	354	5.803
CHLORIDE DISS	7.9	0.223
SULFATE DISS	100	2.082
NO2+NO3 AS N D	0.03	0.003
TOTAL		8.109

PERCENT DIFFERENCE = 1.22

pH = 7.4, April 26, 1976. (Portable pH meter)

Figure 3.-- Partial chemical analysis of a water sample collected from the Deer Creek Mine.

SURFACE WATER HYDROLOGY

Technical Examination Input for Developing
Environmental Analysis Reports for Coal Lease Continuances

Coal Lease Numbers

SL-070645
SL-066116
U-02292
U-02664
U-06039
SL-051221
U-014275
SL-050133

John Rector
Robert J. Anderson

August 1976

I. Introduction

This report is a documentation of the surface water hydrology for lands overlying and adjacent to coal leases: U-06039, U-051221, U-014275, U-02292, SL-066116, U-02664, U-050133, and SL-070645.

Primary emphasis was placed on evaluating leases U-06039, SL-070645, U-02292, and U-02664, as these lease areas have the highest hydrologic resource potentials. Leases SL-050133 and SL-066116 are located on slick rock escarpments and presented little opportunity for hydrologic evaluation. The areas do not have defined stream channels nor soil mantles of sufficient development to recharge ground water supplies. These two areas do contribute marginal quantities of water to flash floods that originate in maple gulch and stump flat. The total hydrologic influence of the areas under lease is limited due to their relatively small size and dispersion over many drainages. Dispersal lessens the impact of any activity on the surface hydrology of a given drainage.

The topics covered in this report include: Flood Hydrology, Water Yield, Water Quality, Channel Analysis and Water Use. These will be covered in light of existing conditions with an orientation toward some possible effects of subsidence.

Flood Analysis

The lease areas were identified as being within the boundary of five drainages: Rilda Canyon, Meetinghouse Canyon, Whetstone Creek, Deer Creek, and Grimes Wash. To identify potential flood impacts on structural development and access routes that exist or have the potential to be placed in the drainages, flood magnitude and frequency curves were developed. In order to be as site specific as possible, the five drainages were divided into nine contributing watersheds, Map 1. Curves were developed for the six primary water yielding watersheds as well as for five logical combinations of contiguous watersheds, Figures 1 through 11. Through applying design life and risk values, these curves will provide design flows for various future development sites within the lease areas.

Due to the lack of stream flow data the values for the curves were derived using the "Regional Method" of flood frequency and magnitude determination. The procedure is outlined in U.S. Geological Water Supply Paper 1683. The mean annual flood* values range from 44 cfs to 100 cfs for individual contributing watersheds.

A flood frequency and magnitude curve was not developed for watersheds "C", "B" and "H". Field reconnaissance of watershed "C" showed poorly

* Defined as the flood having a reoccurrence interval of 2.33 years, (the average interval of time within which the flood will be equaled or exceeded once, based on the extreme value distribution).

defined channels indicating that surface runoff is not a common phenomenon. It is felt that water from "C" enters watershed "A" as ground water accretion through the porous Blackhawk and Castle-gate sandstones. The presence of water tollerant vegetation in existing draws indicates that there is a zone of saturation beneath the surface. Though no apparent flood hazard presently exists, surface disturbance that contacts the zone of saturation in depressions and draws could lead to surface runoff. The amount of runoff would be proportionate to the size of the area exposed.

Accretion waters from "C" are accounted for in curves "AC" and "ABC" figures 7 and 8 respectively.

Watersheds "B" and "H", though delineated, are felt to be minor contributors of flood flows due to their small areas. The topographic configurations, steep dissected canyons having limited vegetative cover, are conducive to rapid concentration and delivery of overland flow if storm cells persist over the areas.

Upper north slope timbered areas of the drainages do not presently contribute significant quantities of surface runoff but are responsible for the majority of base flows. Conversely the upper south slopes produce the majority of summer storm peak runoff and contribute only marginal water to base flow. This implies that surface disturbance on the timbered upper north slopes would have a more dramatic effect on increased runoff than comparable disturbances on the upper south slopes. Normal annual precipitation in the upper reaches of the drainages is between 25 and 30 inches.

Lower canyon areas are rocky and poorly vegetated. Rainfall interception and infiltration rates are low. As a consequence the majority of incident precipitation runs off and is rapidly delivered to drainage systems. The implication is that development in these lower portions of the drainages would have little marked effect on increasing flood potentials over those that normally exist. Normal annual precipitation in the lower portions of the drainages is between 20 and 25 inches.

One flood source area of particular concern was identified in Meetinghouse Canyon. It is located in T17S, R2E, Section 10, just below the confluence of Whetstone Creek and Meetinghouse Canyon. The area has been shaded on Map 1. The channel is approximately 2,000 feet in length with an average slope of 62 percent. The area of the tributary canyon is approximately .16 square miles. The drainage shows evidence of past mud rock flows where boulders in excess of 8 feet in diameter have been moved. A 10, 50, and 100 year recurrence interval flood magnitude was developed for the canyon using the Soil Conservation Service Runoff Curve number method. A flood magnitude and frequency curve of the results is shown in Figure 12. This area is being identified as a factor to be further evaluated if development in Meetinghouse Canyon becomes a future consideration.

Water Yield

Water yield is a significant Forest product within the areas of consideration. Annual water yields were estimated using a nomograph from "Water Yields in Utah." (Bagley et. al. 1964.) The nomograph was developed using stream gaging records available for the study area. The predictive nomograph was tested by the authors and found to be accurate. The following statistics were computed to describe the nomograph accuracy in terms of the data that was used in development.

Coefficient determination (R^2) - .82
 Standard error (S_e) - 2.10 inches
 Coefficient variation (C_v) - .30

The data, representative of the lease areas, necessary to utilize the nomograph was taken from the following sources.

<u>Independent Variable</u>	<u>Source of Data</u>
Elevation	USGS 15' Quadrangle Map and Altimeter
Drainage Density	USGS 15' Quadrangle
Geology	<u>Central Utah Coal Fields</u> by H. H. Doelling
Latitude	USGS 15' Quadrangle

A copy of the nomograph is presented as figure 13.

Estimated water yields were developed for three areas; Rilda Canyon, Meetinghouse/Deer Creek, and Grimes Wash. These computations and their base data are shown below.

<u>Watershed</u>	<u>Mean Elev. (ft)</u>	<u>Drainage Density</u>	<u>Geology Factor</u>	<u>Latitude</u>	<u>Est. Average Annual Runoff (Area inches)</u>
Rilda Can.	9100	1.32	.60	39° 25'	11.5
Meeting- house/Deer Creek	8740	.97	.45	39° 21'	10.2
Grimes Wash	8500	1.03	.45	39° 20'	9

Based on stream gage records, an average annual yield for the entire Huntington Creek drainage was found to be 7.33 inches/year.

From the above data, it can be seen that the lease areas contribute greater quantities of water to Huntington Creek than would be expected based on

their area. For this reason, mining activities, either surface or sub-surface, which will have a detrimental effect on water yield will have a disproportionately high impact on the water of Huntington Canyon. The quality of water yielded from the higher elevations is critical to agriculture. Because of the saline nature of the soils in the valley, water with low concentrations of dissolved solids is desirable for irrigation. If mining activity were to fracture or displace the water-bearing strata, creating additional solution surfaces, additional dissolved solids would be introduced to the water. This would markedly diminish the water's value for irrigation as presently the higher elevations produce the least mineralized waters in these drainages. This facet of water quality is mentioned under water yield for two reasons. First, it affects the efficiency of the water yielded for agricultural use. Secondly, it is related to the salt loading potential of the geohydrologic phase of the hydrologic cycle. This salt loading is a function of water quantity and available salt concentration.

Water Quality

The Forest non-point pollution program encompasses the monitoring of the Wilberg Mine in Grimes Wash. There are five sample stations from which data have been collected since May of 1975. The intention of the monitoring is to identify physical, chemical, and biological changes that may occur with the quality of surface water as a result of coal mining. Analysis of data to date has been inconclusive. All acquired data has not been stored in the EPA computer system. The analysis of the available data, May 5 to August 4, 1975, is presented in Tables 1 through 5. The sampling stations are located on Map 2. From this limited data base, some rudimentary evaluations can be made.

The waters are presently oligotrophic, low in biological productivity. There are sufficient primary nutrients present to allow for good productivity but the high pH and alkalinity inhibit growth of primary producers. Arsenic, hexivalent chromium and selenium are occasionally present at the lower limits of detection, however, the majority of the samples analyzed have shown no detectable concentrations. Iron concentrations have been found upon occasion to be in excess of State drinking water standards. Sediment concentrations are low during base flow but show heavy loading during summer runoff events. This reflects the inherent erodibility of the landforms. Waters derived from the sandstone formations are lower in anions, i.e., sulfates, chlorides, carbonates, etc., than those waters flowing over marine shales. Bacteria levels show a high coefficient of variation. The fluxuation is felt to be the result of intermittent surface washing of fecal matter from wildlife and livestock, and decaying organic matter. The limited analysis indicates that at the time of sampling geology and landform were the major factors influencing water quality in Grimes Wash.

It should be kept in mind that the above is not all inclusive and is not intended to mean mining does not effect water quality. The Wilberg Mine was not completely developed at the time of sampling. Both house and maintenance areas were yet to be established. The potentials for pollution by bacterial loading, sediment generation, introduction of metals and reduction of pH are very probable but as yet unquantified.

The monitoring program is continuing on the Wilberg Mine and should provide more conclusive results as more data are obtained and analyzed.

Channel Analysis

The method used to evaluate stream channels consisted of a physical inventory and stability characterization of the drainages within and tributary to the lease areas. The system was developed by Dr. Megahan and a copy of the field form used is shown as figure 14. Results of analysis showed that of the 29 miles of channel inventoried, 35 percent was in poor condition. The condition class break down is as follows:

<u>Condition Class</u>	<u>Miles of Channel</u>
Excellent	4.7
Good	9.1
Fair	3.0
Poor	10.0

The geographic location of the various channel conditions are shown on map 3. A summary of channel condition ratings is also presented in Table 6.

Stream channels and associated riparian vegetative systems are highly significant systems in terms of management and protection. They function as primary habitat for wildlife, offering water, forage, and sanctuary. Vegetative production is greatest in the channel environment. Growth rates, biomass production, and palatability are optimized. These factors result in a positive correlation between species diversity, biomass productivity, and stability of channel systems. Recreation and aesthetics are also closely tied to channel systems. Deeply incised, eroded channels are visually unappealing. Recreational activities are notably concentrated along stable, well vegetated channel systems. The quality of water yielded from drainages is directly correlated to stable, well vegetated systems. Vegetation stabilizes stream banks and bottoms and inhibits lateral and vertical scour, thereby reducing sediment concentrations. The shading effects of vegetation preclude water temperature increases from solar radiation which results in improved oxygenation capability.

In light of the above considerations, and the fact that condition class analysis showed most of the channels in poor condition; more thought should be given to channel protection and rehabilitation as opposed to considering future disturbance. Consideration should be given to impacts on the described channel system characteristics prior to development of facilities and access routes within the channel system corridors.

The most severely degraded channel is located in a tributary canyon of Meetinghouse Canyon. (See description under "Flood Analysis.") The canyon has historically been the source of mud rock flows. The channel

is braided and has a large depositional fan, comprized of large boulders, at its mouth. Deer Creek also has some severe channel problems. Flood waters yielded as a result of poor watershed conditions on south slopes have caused scouring of the channel bottom. Scouring has resulted in verticle banks 30 feet deep in places and mass failure of the banks. The process is continuing. Severe undercutting and lateral tension release cracks are evident along reach B of Deer Creek (see map 3). The single most restraining factor of this erosion and mass wasting is the presence of spruce and aspen stands whose roots bind the soil mantle. The effectiveness of this vegetation is diminishing. The deepening of the channel has strained the soil mantle to the point of failure. Sod, trees, and large quantities of soil have been sluffing into the channel. Additional disturbance of this stream channel will greatly accelerate the mass movement processes.

Water Uses

There are presently two municipal culinary water systems in the proximity of the lease areas. Both systems depend on springs as the source of water supply. A brief discussion of each system is presented below.

North Emery Water Users Association

There are springs developed in Rilda Canyon which convey water via a pipe system down through Huntington Canyon to the towns of Elmo and Lawrence. Preliminary drawings, Plate 1, show an original intent to also tap springs in Meetinghouse Canyon. The spring developments and pipe line are in T16S, R7E, Sections 27, 28, and 29. They consist of perforated pipe with concrete cut off walls tied into a 6" diameter pipe delivery line. The existing Forest Special Use Permit does not mention quantities of water nor make provision to leave any free flowing water at the spring source.

Huntington City Corporation

Springs in Bear Canyon and Little Bear Canyon are developed and conveyed by a pipe line system, through Huntington Canyon, to the City of Huntington. Plates 2 and 3 show the location of the delivery system. No flow quantification information was available. No known special use permit exists for the water system development.

There is one other known existing spring development system in the lease area that should be mentioned. The development provides domestic water to the "Church" mine.

Utah Power and Light Company Church Mine

Trailer Bog Spring and Burnt Tree Spring are developed and conveyed via pipe line a distance of 4 to 5 miles to the mine property. The water lines and spring developments are located in T17S, R7E, Sections 15, 16, 22, 23, and 26. Plate 4 shows the location of the developments and conveyance lines. The Forest Service contested the approval of application No. 14466 by the State Engineer for allocation of 24.75 GPM from the Burnt Tree Spring to the mine. As a result, a cooperative agreement, dated March 20, 1942, between Cooperative Security Corporation (the developer) and the Forest Service provided that a 2-gallon per minute pipe and trough system be installed. The system was installed to provide a source of water for stock and the general public. The agreement covers the Burnt Tree Spring waters for a period of May 15 to November 1, inclusive, for each year. It is not known if the pipe and trough system is still functioning. A Forest Special Use Permit does exist for this development.

Mining activity and associated subsidence could substantially affect the springs mentioned in the above descriptions. Impacts could be of three types. First, displacement of existing source aquifers could reduce or eliminate water from the springs. Second, displacement of aquifers could cause the springs to produce more water as could fracturing of rock under perched water tables that presently do not surface as springs. Third, either the loss or accretion of water could substantially effect the quality of the water at the spring sources. This quality impact could either be positive or negative pending the quality of the accreted water or the dilution capability of the water that may be lost.

These impacts are a function of source location of existing aquifers and presence of perched water aquifers.

FIGURES

9-1796
Flood data plot
(March 1949)

FIGURE 1

UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

File Number

Annual floods on WATERSHED A
Drainage area..... 3.6 sq. mi. Period MEAN ELEVATION 9205.

PEAK DISCHARGE CFS

100
200
300

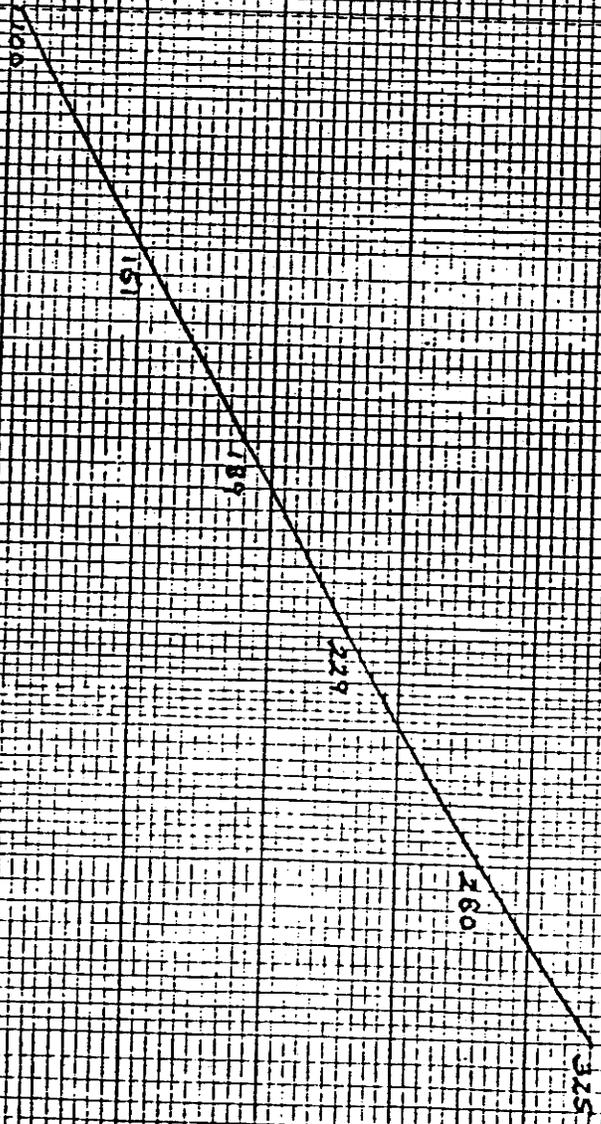
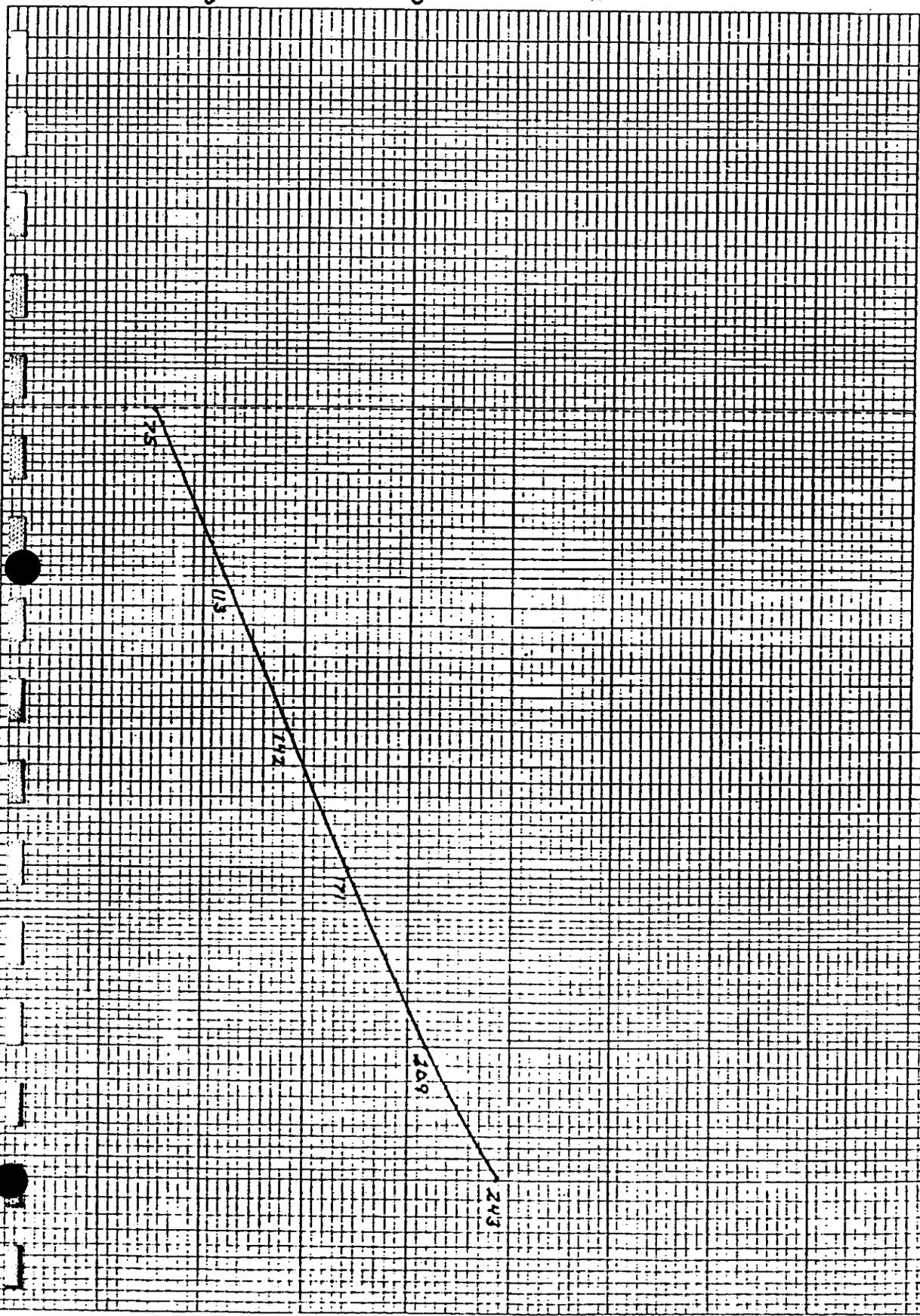


FIGURE 2

Annual floods on WATERSHED D

Drainage area, 21.3 sq. mi. Period MEAN ELEVATION 9250



9-179a
Flood data plot
(March 1949)

FIGURE 3

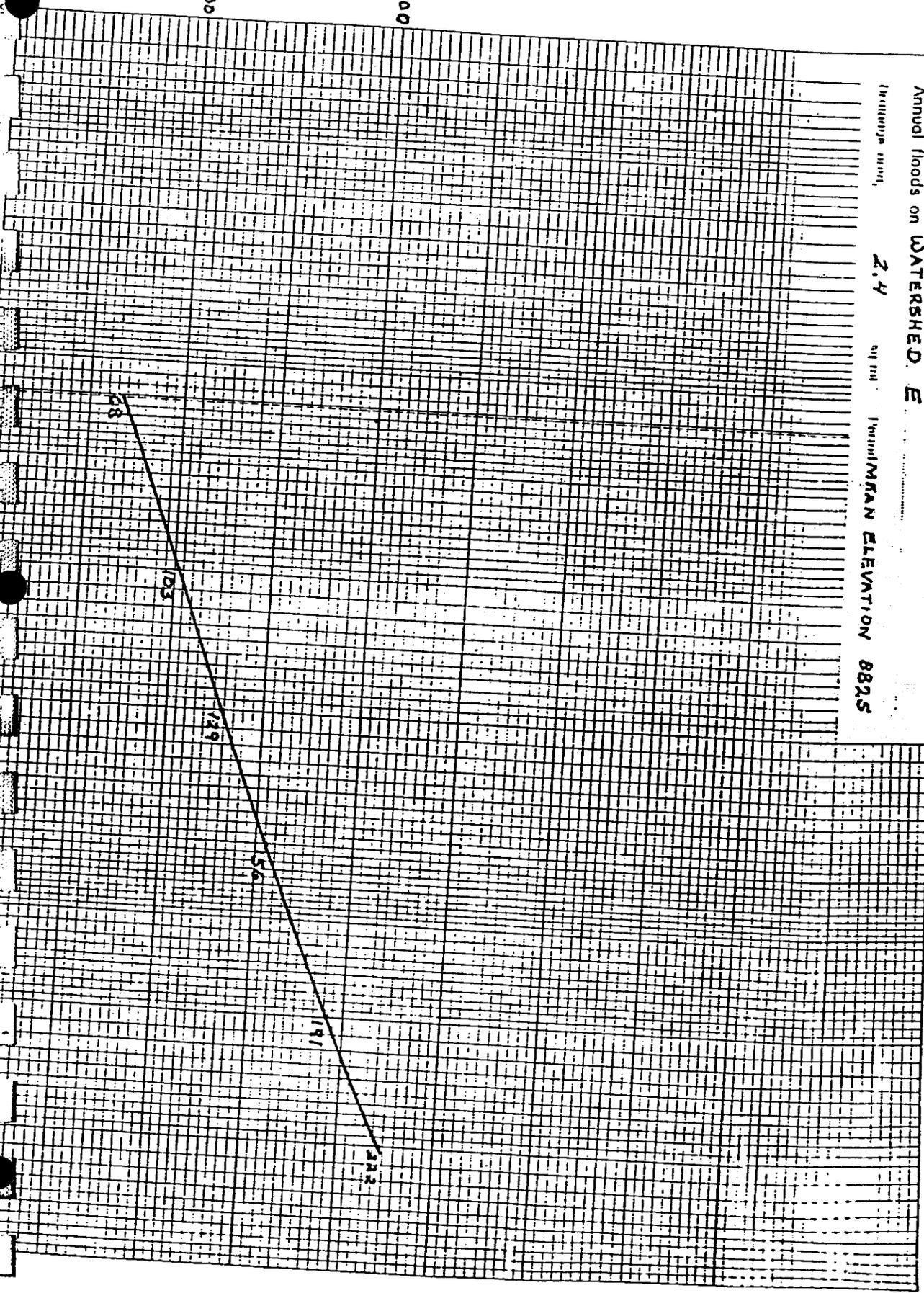
UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

File Number

Annual floods on WATERSHED E

Duration month, 2.4
gpm ft
THRESHOLD ELEVATION 882.5

PEAK DISCHARGE CFS
100
200



9-179a
Final data plot
(March 1949)

FIGURE 4

UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

File Number

Annual floods on WATERSHED **F**
Drainage area, **2.4** sq. mi. Period MEAN ELEVATION **8560**

PEAK DISCHARGE CFS

100

200

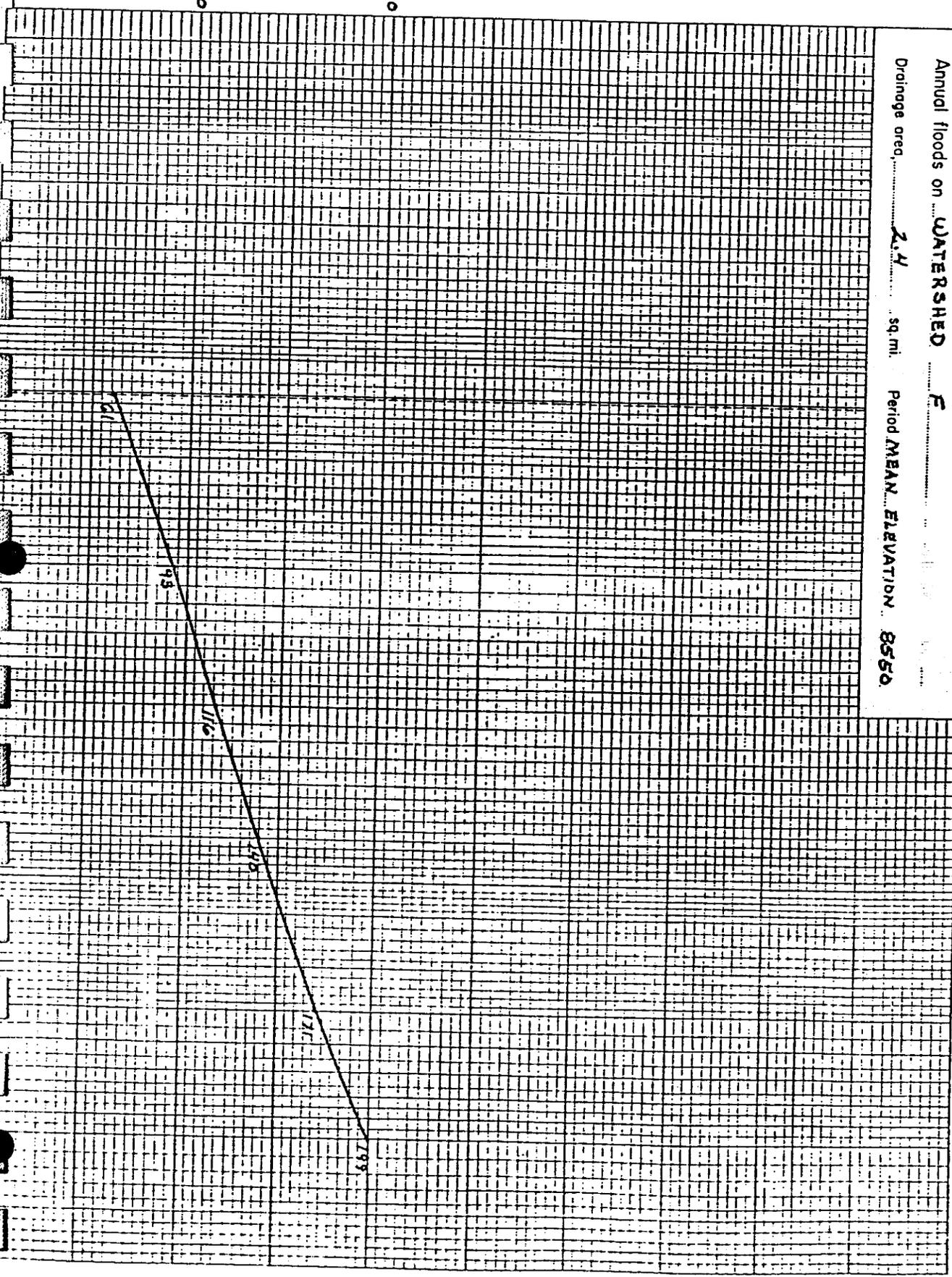


FIGURE 5

UNITED STATES DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

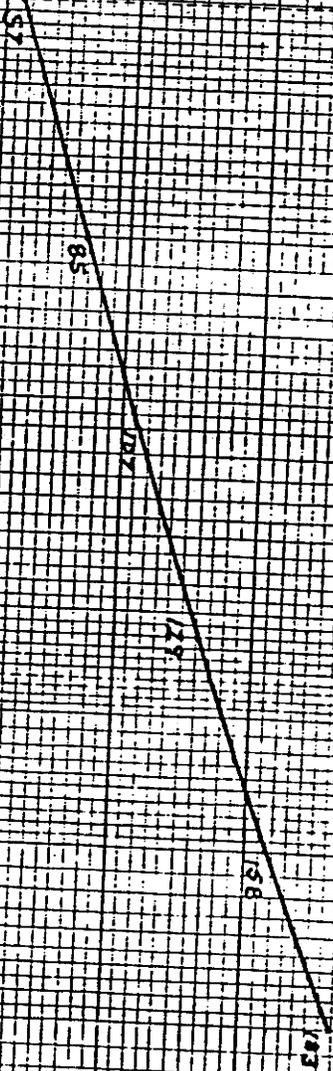
File Number

Annual floods on WATERSHED G
Drainage area 2.1 sq. mi. Period MEAN ELEVATION 8550

PEAK DISCHARGE CFS

100

200



ENVIRONMENTAL ASSESSMENT
FOR THE
DEER CREEK MINE

PREPARED BY:

U.S. OFFICE OF SURFACE MINING
WESTERN TECHNICAL CENTER

MARCH 18, 1985

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ENVIRONMENTAL ASSESSMENT
FOR THE DEER CREEK MINE,
EMERY COUNTY, UTAH

March 18, 1985

INTRODUCTION

The Deer Creek Mine is an underground coal mine owned by the Utah Power and Light Company (UP&L) and operated by the Emery Mining Company. The mine is located in central Utah approximately eight miles west of Huntington, Utah. The proposed permit area covers 14,620 acres, approximately 7,200 acres of which will be undermined. Approximately 91 percent of the permit area is underlain by thirteen Federal coal leases. The remaining coal is either owned by UP&L or leased to UP&L. Coal reserves total approximately 186,000,000 tons with 95,000,000 tons recoverable. Federal surface on the proposed permit area totals 8,225 acres with 7,985 acres managed by the Manti-LaSal National Forest, and the remaining 240 acres managed by the Bureau of Land Management. The proposed mining rate will average 2.5 million tons per year. The estimated life of the mine is 47 years.

The Bureau of Land Management, Branch of Solid Minerals, granted approval of the Deer Creek Resource Recovery and Protection Plan (RRPP) on October 31, 1984. The Office of Surface Mining (OSM) has determined that the northern leases proposed for permitting by the applicant (U-06039, SL-051221, and U-024317) cannot be permitted at this time because the applicant has not obtained the right-of-entry to access privately owned lands adjacent to these coal lease areas. Therefore, the permit area and mining plan area are 2,280 acres smaller than the RRPP approval area. The proposed area of mining plan approval and permit approval are identical.

Adjacent to the Deer Creek operation is the Wilberg Mine, the Des-Bee-Dove Mine, and the Trail Mountain Mine. Deer Creek, Wilberg, and Des-Bee-Dove are owned by UP&L. While the Deer Creek Mine is primarily devoted to mining the Blind Canyon coal seam (with the exception of the northern part of the permit area where both the Blind Canyon and Hiawatha seams are mined), the Wilberg Mine is primarily devoted to mining the Hiawatha coal seam which is situated below the Blind Canyon seam. Therefore, most of the Deer Creek and Wilberg Mines overlap (Figure 1). The Des-Bee-Dove Mine is situated adjacent to Deer Creek and Wilberg on the east. The Trail Mountain Mine (Trail Mountain Coal Company) is adjacent to Deer Creek and Wilberg on the southwest.

Other active mines in the vicinity of the Deer Creek Mine are the Hiawatha Mine (King Mines), the Star Point Mine, Crandall Canyon Mine, Huntington Canyon Mine, and the non-Federal Bear Canyon Mine.

PURPOSE AND NEED FOR ACTION

The Deer Creek Mine has been operating under a permit issued by the State of Utah, Division of Oil, Gas and Mining (UDOGM) (ACT/015/018) since May 11, 1978, with approval under 30 CFR 211 issued by the U.S. Geological Survey on January 23, 1978. To continue mining, the applicant has submitted an underground mining and reclamation permit application in compliance with the Coal Mining and Reclamation Permanent Program (Chapter 1) of the State of Utah. The necessary federal action is to approve, disapprove, or conditionally approve the permit and mining plan in accordance with the requirement of SMCRA and the Mineral Leasing Act. This environmental assessment will address the environmental consequences of the proposed mining operations and reclamation plans in the permit application package. The consequences of no permit approval will also be addressed. The purpose of this document is to assist the decision makers in making a decision with respect to NEPA compliance.

DESCRIPTION OF ALTERNATIVES

Proposed Action: Approval of the Permit Application Package, With Conditions

OSM may approve the operator's permit application package for the 14,620 acres of coal subject to certain conditions.

Alternative I: No Action

SMCRA and the Mineral Leasing Act requires that the Secretary of the Interior approve, disapprove, or conditionally approve mining operations on Federal leases. Therefore, the alternative to take no action is not viable and will not be discussed further.

Alternative II: Disapproval of the Permit Application Package

Disapproval of the permit application package would result in permanent closure of the existing mining operation. All facilities are in place at the Deer Creek Mine, so this alternative would not result in long-term impacts greatly different from the proposed action. Under this alternative, the mine operator would begin reclamation at the disturbed area.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

Soils

Soils in the proposed permit area are composed of three map units. These units are Typic Cryochrepts-Lithic Cryorthents-Rock Outcrop, loamy skeletal, shallow association (40-60 percent slopes); Pachic Cryoborolls, loamy and loamy-skeletal (10-25 percent slopes), and Typic Cryoborolls, loamy and loamy-skeletal (25-40 percent slopes). The Typic Cryochrepts association is composed of soils which are primarily loamy skeletal and lithic with areas of sandstone outcrops. Cryochrepts have a gravelly loam or sandy loam surface layer 35 cm thick with 25 percent sandstone fragments underlain by a gravelly or stoney loam 100 cm thick with 35-50 percent sandstone fragments. Cryorthents are primarily shallow and are underlain by rock within 50 cm of the surface. The Pachic Cryoboroll soil has a loamy surface layer about 60 cm thick overlying a loamy subsoil 30 cm thick. The substratum is a gravelly sandy loam containing 50 percent sandstone fragments. The Typic Cryoboroll soil is characterized by a loamy surface layer about 40 cm thick over a calcareous substratum with up to 50 percent sandstone fragments.

Hydrologic Resources

The Deer Creek permit area comprises approximately 14,620 acres of land located within Cottonwood and Huntington drainages. The disturbed area (surface disturbance, 25 acres) is drained by Deer Creek, a tributary of Huntington Creek. Most tributaries located on the permit area are ephemeral or intermittent except for Deer Creek, the left fork of Grimes Wash, and sections of Meetinghouse and Rilda Canyon Creeks. Meetinghouse is considered to be perennial below Elk Spring, and Rilda Canyon Creek is considered a perennial stream below the confluence of its right and left forks. Elevations in the general area range from around 7,000 feet in the canyon bottoms to 10,000 feet along the ridges and plateaus. Sediment-treated water from the Deer Creek Mine facilities area drains into Huntington Creek, approximately three miles north of the main tipple. The Huntington Creek drainage basin encompasses 181 square miles above its confluence with Deer Creek. Huntington Creek, a perennial tributary to the San Rafael River, annually yields approximately 67,000 acre-feet of water. The discharge averages approximately 96 cfs.

The major drainages within the permit area are relatively small perennial to intermittent streams. This base flow is sustained by spring discharges and groundwater seeps. Most of the annual flow (approximately 65 percent) comes in April through June in response to snowmelt. The water quality of the surface drainage is generally good and can be characterized as a calcium-magnesium bicarbonate water with total dissolved solids ranging from 300 to 600 milligrams per liter.

The majority of springs on East Mountain occur in the North Horn Formation, which consists of variegated shales, sandstones, conglomerates and freshwater limestone. The overlying Flagstaff Limestone is highly fractured, which allows for good vertical transport of water with little lateral movement, and hence few springs. The Flagstaff serves as a local source of recharge to the North Horn Formation. The existing water quality of the springs on East Mountain is good and is of similar chemical character to the surface water. The applicant has identified numerous springs and seeps within three miles of the permit area.

Vegetative Resources

The permit area includes five vegetation types: mixed conifer, pinyon-juniper, sagebrush, grass, and riparian. Mixed conifer primarily occurs at higher elevations and on north-facing slopes, and is the most extensive floral community. The next most extensive community is pinyon-juniper which occurs on steep rocky slopes with a southern exposure and on more gentle terrain at lower elevations. The sagebrush and grass communities occur at higher elevations on more moisture deficient sites. The riparian community occurs along Cottonwood Creek on the western side of the permit area, with some along Deer Creek.

Fish and Wildlife Resources

Wildlife species inhabiting the mine permit area and vicinity are typical for this region of the Wasatch Plateau. Several game and high-interest species inhabit the general vicinity of the mine permit area. None are potentially exposed to any significant impact. Riparian habitat along Deer Creek is considered of high value to the area's wildlife resources; however, none of the habitats present are unique or restricted to the mine permit area. No fish species occur in Deer Creek or Grimes Wash in the vicinity of the mine facilities, although the drainages are tributary to Huntington Creek, which does support trout and is classified as a Class 3 fishery.

Cliffs in the vicinity of the mine portal and facilities area represent potentially valuable cliff-nesting habitat for several species of raptors (e.g. golden eagle, red-tailed hawk, and prairie falcon). Wooded habitats within the permit area also provide nest sites for tree-nesting species such as northern goshawk, Coopers's hawk, sharp-shinned hawk, red-tailed hawk, American kestrel, and screech owl. The bald eagle is a winter visitor to the area. A 1981 U.S. Fish and Wildlife Service raptor survey for cliff-nesting species identified two golden eagle nests (No. 57 & 59) and one raven nest (No. 58) within one kilometer of the Wilberg Mine portal area. All were inactive in 1982. Four buteo nests were located near the Deer Creek Mine facilities area. One of these nests was an active red-tailed hawk nest in 1981. All were inactive in 1982. In addition, an inactive raven nest (No. 46) occurs within one kilometer of the Meetinghouse Canyon breakout (Map 2-18, PAP Vol. 6).

Mule deer occur within the permit area year round. During the summer they are found predominantly in habitats at the mid to upper elevations in the permit area (e.g., mixed conifer, sagebrush, and grassland). In the winter, habitats at the lower elevations (especially pinyon-juniper) along the benches and slopes of the southern and eastern portions of East Mountain are designated by the Utah Division of Wildlife Resources (UDWR) as high-priority and critical mule deer winter range. The pre-law waste rock storage site and portions of the access/haulroad and sewer absorption field occur within high-priority mule deer winter range.

Land Use

Surface ownership of the Deer Creek portal and facilities area is private (UP&L Co.). The majority of the remaining land within the mine permit area is either privately owned or is part of the Manti-LaSal National Forest. The Bureau of Land Management manages 240 acres.

Premining land uses in the disturbed areas associated with the Deer Creek Mine were livestock grazing and wildlife habitat. Land use on and adjacent to the permit area consists of recreation, mining, wildlife habitat, and limited livestock grazing.

Topography

The Deer Creek Mine is located at the junction of Deer Creek Canyon and Elk Canyon. The facilities area is for the most part located on a flat area created by pre-law fill material along the stream, but is adjacent to a steep hillside. The hillside has been excavated to form additional work area for the operations. The cliff above the mine is formed by interbedded shales and sandstones and massive sandstone layers. The sandstone layers form vertical cliffs over much of the hillside.

Cultural Resources

See Addendum A

Socioeconomics

See Addendum B

ENVIRONMENTAL IMPACTS OF THE PROPOSED ALTERNATIVE

Soils

The soils existing at the Deer Creek Mine were buried during previous mining operations. No new disturbances are planned at this site.

Because soil for reclamation is lacking, the applicant proposes to attempt to develop a substitute soil by temporarily reclaiming various existing fill slopes which will not be disturbed during mining (see Chapter X, Technical Analysis, Revegetation). It is assumed that the surface material of the slopes, through temporary reclamation, will increase in organic matter content and microbial populations, thereby providing a planting medium superior to existing fill materials. At the onset of final reclamation grading, this "topsoil" would be stripped from the temporarily reclaimed slopes and temporarily stockpiled during backfilling and grading operations. As grading is completed, these cut-and-fill seedbed materials ("topsoil") will be distributed on newly graded surfaces to a depth of 6 to 12 inches at random locations throughout the site to enhance reclamation potential.

The seedbed at the Deer Creek Mine will consist primarily of fill composed of sandstone and shale parent material. During previous mining coal wastes became mixed with this material at and adjacent to coal handling facilities. Mixing will continue through the life of the mine (potentially 47 years). The applicant has committed to burying all toxic materials, which will result in the use of uncontaminated fill as seedbed material after final grading. Therefore, the impact of coal mixing is considered slight.

Erosion of fill, and therefore future seedbed materials, will occur during operations as a result of wind and water forces. The potential for erosion is greatest on the slopes of the major construction fills. To decrease erosion potential, the applicant will fertilize, plant, and mulch these slopes during the first year of operations. Irrigation will be used on subsequent plantings if the first seeding attempt fails. Though slope reclamation will reduce erosion to some degree, the success of revegetation cannot be quantified at this time. Erosion will be significantly reduced for at least one year after planting due to mulch application. As mulch decomposes, erosion will increase until vegetation becomes established.

Soil in stockpiles will be subject to compaction, a reduction in nutrient levels, and a reduction in the microbial populations. Soil structure will also be lost during salvage. Compaction will be relieved during soil reapplication. Nutrient levels will be re-established through fertilization. Microbial populations should readily re-establish in the soil matrix through inoculation from surrounding areas. Soil in stockpiles will be lost through erosion. This loss, however, should be minimal with respect to the total amount salvaged. The applicant's commitment to temporarily revegetate berm stockpiles will reduce soil loss resulting from erosion.

Reapplied soil will be subjected to erosion from the time of final grading until revegetation is established. As in the case of temporary revegetation of Wilberg Mine fill slopes, erosion should be significantly reduced from the time of mulch application until applied mulch decomposes and no longer provides surface protection. Erosion will likely increase at this time until vegetative cover is established because of the quality of seedbed material involved, the steep postmining slope gradients, and the average annual precipitation. Because of the commitment to irrigate if the initial planting fails, the significance of this impact is reduced both in terms of magnitude and duration. With respect to these factors, the erosion impact is considered less serious for both the Cottonwood fan portal and the waste rock disposal site. It is believed that establishment of vegetative cover to presumed premining levels can be accomplished more rapidly at these sites. Therefore, the duration of the erosion impact, compared to that of the main mine site, is reduced.

Surface Water Hydrology

All surface drainage facilities are designed to safely control water and sediment runoff from all disturbed areas. In addition, all surface water originating from undisturbed lands upstream of the facilities area will be controlled and diverted around the operation. Storm runoff from within the mine facilities area is collected in a system of open ditches, bermed roadways and culverts, and is discharged to the sediment pond at the base of facilities area. All undisturbed runoff is discharged to Deer Creek below the facilities area.

The sediment pond is designed to detain the 10-year, 24-hour storm. It should be noted that when the design event is exceeded (i.e. storms larger than the 10-year, 24-hour storm), sediment detention times will be reduced, leading to a slightly higher sediment load in Deer Creek.

Runoff from 25 acres of disturbed land will be temporarily detained in the Deer Creek Mine sediment pond. This water will be released to Deer Creek following the required 24-hour detention. The surface-water impact associated with the Deer Creek Mine operations will be minimal.

At the end of mining and reclamation, impact to the surface-water system will be minimal. It is not anticipated that significant dewatering of the springs by mining and associated subsidence will take place. Fourteen springs located on the permit area are closely monitored by the applicant. Should mining at the Deer Creek Mine affect the recession behavior of these springs, the applicant has committed to replace the lost water supply.

Reclamation of the drainage at the Deer Creek Mine will consist of removing the temporary drainage system, diversion and sedimentation pond. Permanent channels will be constructed over the fill and into a splash basin. The Utah program regulations currently require all diversions to be routed away from fill. However, the applicant's proposal has been determined to be sound engineering design and acceptable as a state-of-the-art experimental practice under UMC 785.13. All channels are designed to pass the 100-year, 24-hour runoff peak flow. The proposed surface-water reclamation plan will have negligible impact on water quantity or quality of Deer Creek and its tributaries.

Ground-Water Hydrology

The Deer Creek Mine discharges an average of 0.7 cfs. The majority of this intercepted groundwater is utilized by the Huntington Power Plant as cooling water. Numerous springs and seeps exist on and near the permit area. The majority of these springs (39 of 59) discharge from the North Horn Formation.

The ground-water system is generally described as consisting of numerous perched aquifers in the North Horn and Blackhawk Formations. These aquifers receive recharge from snowmelt and influent stream through a system of fractures and faults in the overlying and occasionally underlying formations. Confining layers of lenticular siltstones and shales direct the lateral movement of ground water. The data collected by the mine generally support this hypothesis. Ground water is intercepted but rapidly diminishes in flow.

With the approval of the mine plan, a detailed ground-water monitoring program will be approved. The applicant will collect data from 59 springs and extensively monitor the discharge recession of 14 springs.

Discharge quantity and quality data will continue to be collected from seeps within the mine, and two wells located off site will continue to provide baseline data.

Based on the available data, it appears that the Deer Creek Mine will not significantly impact the ground-water resources of the area. Because of the uncertainties associated with the hydrologic consequences of the proposed and continued operations, the applicant has committed to a detailed ground-water monitoring program. In the event that monitoring data should indicate a significant impact occurring, the applicant has committed to mitigation of the impact.

Vegetation Resources

Only pinyon-juniper vegetation has or will be disturbed in the Deer Creek Mine permit area. Twenty-five acres of pinion-juniper vegetation has been disturbed by the Deer Creek Mine at the main facility area. No further disturbance will occur. Since revegetation will restore the native species to these areas, the long-term impacts should be minimal.

Fish and Wildlife

Surface disturbances associated with the Deer Creek Mine total approximately 25 acres, all within pinyon-juniper habitat. The disturbed area will remain devoid of wildlife habitat for the life of the mine and until reclamation is successful. None of the areas affected represent any unique habitats for the region or critical habitats for threatened or endangered species. Because of this and the limited extent of surface disturbance, the overall potential for impact on wildlife species resulting from loss of habitat will remain relatively minor.

Other mine-associated wildlife impacts that may be more important than direct loss of habitat include (1) human harassment of wildlife, (2) mule deer road kills, and (3) the potential effects of subsidence on springs and raptor cliff-nesting habitat. The effects of human harassment on wildlife, either inadvertent or purposeful, should be considered from a cumulative standpoint since at least three other mines are currently operating along the southern end of East Mountain. However, since premining baseline data for wildlife

populations in the area are lacking, these effects are extremely difficult to quantify. Company-sponsored wildlife educational programs should help to reduce harassment of wildlife as much as possible.

Mine-related subsidence is not expected to impact springs within the Deer Creek permit area. The total spring flow within the permit area is small in comparison to the total spring flow on East Mountain. Spring monitoring will allow early detection of subsidence effects on the springs system so that any necessary mitigation measures can be initiated to protect the hydrologic balance from the cumulative effects of the Wilberg and Deer Creek Mines Complex.

At a minimum, mine activities will likely preclude raptor nesting use of cliff nest sites within one kilometer of the Deer Creek Mine facilities area. The effect of subsidence on raptor cliff nesting habitat is considered to be minor. Subsidence at a cliff face will simply create new cliff face that will provide equivalent nesting habitat. The only nest potentially affected by subsidence is one inactive raven nest (No. 46) located in Meetinghouse Canyon (Map 2-18, PAP Vol. 6). If subsidence affects this nest or any nests constructed in the future, the permit requires the mine operator to work closely with State and Federal agencies to mitigate damage to the nest sites.

Land Use

Surface disturbance associated with the Deer Creek Mine will remain until reclamation is completed following mine closure. Land-use impacts resulting from surface disturbance will be relatively minor, since these areas have already been disturbed and will not be expanded. In addition, premining grazing use of these areas was limited because of steep slopes and generally low levels of available wildlife forage.

Backfilling and Grading

The applicant is planning to return the surface disturbances associated with the Deer Creek Mine to a suitable postmining topography capable of supporting the intended postmining land use. The fill, a pre-law structure supporting the surface facilities, will remain. The location of this fill in the canyon will not be inconsistent with the surrounding topography. The stability of the fills as they exist and after reclamation has been evaluated and meets the requirements of the regulations. This conclusion is based upon analyses presented by the

applicant, and the duration of the fills over which there have been no major slope failures. The environmental and economic factors associated with the alternative of removing the fill are considered detrimental when compared to the applicant's proposal and designs for leaving the fill. The post-mining drainage system has been evaluated in Chapter II of the technical analysis (TA) document and has been found to be adequate. The applicant is granted a variance from the requirements of UMC 817.72(d).

Coal waste and pyritic materials will be diluted with low sulfur rock and fill material, and will be buried under four feet of non-toxic fill as will road-base material and sediment from the sediment pond. The applicant has proposed plans for backfilling that will ensure the mass stability of the slopes.

Subsidence

Approval of mining in the Deer Creek Mine will result in lowering of the ground surface possibly over 10 feet in many areas of the mine where multiple seam mining will occur. In areas of deep cover (greater than 1,400 feet), monitoring has shown that up to 6 feet of subsidence has not resulted in any significant impacts to the ground surface, seeps, or springs. Some uncertainty exists as to what extent of surface cracking might occur. Possible impacts include (1) fracturing of the surface, which would be a hazard to cattle and wildlife, (2) fracturing along cliffs, which could cause slope failures and possibly disrupt raptor nests, and (3) fracturing of overburden through the North Horn Formation which could result in disruption of some seeps and springs. Information to be submitted by the applicant in annual monitoring reports will identify the probable extent of these impacts. At this time, there is no positive evidence of detrimental subsidence effects to streams or springs. The applicant has proposed adequate measures to mitigate subsidence cracking, and has committed to mitigation of other subsidence drainage that may occur.

Cultural Resources

See Addendum A

Socioeconomics

See Addendum B

IMPACTS OF THE DISAPPROVAL ALTERNATIVE

Disapproval of the permit application would shut down the existing Deer Creek mining operation and reclamation of the present disturbance would commence. Given the 47-year life of the mine and the prospects of no additional surface disturbance, this alternative would provide few additional environmental benefits and would result in the loss of the recoverable coal reserves. The final extent of subsidence related impacts would be reduced as no further mining would take place. The most noticeable impact would be socioeconomic in nature, resulting in the permanent loss of jobs in the area. It is possible that some of the existing staff at Deer Creek would be used for reclamation operations. Coal would have to be obtained elsewhere, impacts would be transferred to other sites.

The impact unique to this alternative would be the loss of 95,000,000 tons of recoverable coal reserves.

Wilberg, Deer Creek and Des-Bee-Dove

Cultural Resources

A. Description of Existing Environment

A single all-inclusive inventory of the three Utah Light and Power (UP&L) mines was conducted in 1980 by Archaeological-Environmental Research Corporation which included intensive inventories of proposed surface disturbance areas and a sample inventory of areas potentially impacted by subsidence. The resulting report summarized previous work in the lease area, including survey of areas around drill hole locations and 160-acre sample units in conjunction with the Central Utah Coal project. Areas surveyed include the Wilberg, Des-Bee-Dove and Deer Creek Mines in Emery County, Utah. Eight sites and 12 isolated finds have been recorded, including one historic site and seven prehistoric sites. Four of the sites (42 EM 1308, 1309, 1310, 1633) are considered eligible for nomination to the National Register of Historic Places. None of the eligible sites were in an area of proposed surface disturbance, although potential impacts from subsidence may occur in the future. The Utah State Historic Preservation Officer has made a finding of "no effect" if the permit is approved.

B. Description of Applicant's Proposal

OSM's administrative review of the cultural resources documentation submitted with the UP&L permit applications identified several inadequacies that required the submission of additional information. The applicant has submitted the required information.

C. Evaluation of Compliance

Applicant's Compliance: Acceptance and implementation of the proposed Special Stipulations (Section F) will indicate that the applicant is in compliance with all applicable regulations and legislation.

OSM Compliance: OSM has received concurrence from the Utah State Historic Preservation Officer concerning eligibilities of sites (recommended as eligible: 42EM 1308, 1309, 1310, 1663 - recommended as not eligible: 42EM 853, 854, 855, 1307), and in a finding of "No Effect" if the permit is approved.

D. Revision to Applicant's Proposal

If the plan is approved, the applicant will satisfy the permit conditions identified in Section F.

F. Proposed Permit Conditions

Standard Permit Condition: If, during the course of mining operations, previously unidentified cultural resources are discovered, the applicant shall ensure that the site(s) is not disturbed and shall notify OSM. The operator shall ensure that the resource(s) is properly evaluated in terms of the National Register Eligibility Criteria (36 CFR 60.6). Should a resource be found eligible for listing (in consultation with OSM), the land managing agency (if the site is located on Federal lands) and the State Historic Preservation Officer require the operator to confer with and obtain the approval of these agencies concerning the development and implementation of mitigation measures.

Special Permit Condition: At such time that OSM, in consultation with the Division of Oil, Gas and Mining and the SHPO, determines that subsidence within the permit area may adversely affect known or unrecorded cultural sites, additional cultural resources studies may be required. This determination will be based on new subsidence or cultural resource information and clear justification will be presented to the applicant.

G. Summary of Compliance

The applicant will be in compliance if all conditions in Section F are adhered to and by ensuring that the proposed permit conditions are followed. OSM is in compliance, and SHPO concurrence has been received.

H. Proposed Departmental Action

The Secretary can approve the application with the proposed Special Stipulations following receipt of SHPO concurrence with recommendations concerning site eligibility and project effect.

I. Residual Impacts of Proposed Departmental Action

Sites which are currently considered ineligible for nomination to the NRHP will be directly impacted and an unknown number of sites will be indirectly affected.

Cultural resources that are considered insignificant today may contain information that would be recognized as significant in the future. These sites could be adversely affected, making future data recovery impossible. Unknown cultural resources may also be adversely affected through operator activities, vandalism and unauthorized collection.

J. Alternatives to the Proposed Action

One alternative would be disapproval of the permit. Another would be to require complete inventory of the permit area and avoidance of all cultural resources during construction of surface facilities. Neither of these alternatives is appropriate.

The preferred alternative is to approve and implement the requirements stipulated in Section F. This allows the applicant to proceed and allows OSM to comply with all applicable Federal legislation and regulations.

Environmental Assessment
Addendum B

DEER CREEK MINE COMPLEX
SOCIOECONOMIC ASSESSMENT

Existing Environment

Utah Power and Light Company currently employs 372 people at the Deer Creek Mine Complex. This includes 75 supervisory and 40 office personnel. This employment level is projected to remain stable in order to produce 2.5 million tons a year of coal throughout the life of the mine.

The primary jurisdictions affected by the mining operation and their current and projected population are as follows:

	<u>1980</u>	<u>1985</u>	<u>2000</u>
Emery County	11,450	15,750	20,900
Castle Dale	2,052	2,835	3,362
Orangeville	1,140	1,890	2,508
Huntington	2,622	3,150	3,762
Carbon County	23,500	29,100	32,250

Source: Southeastern Utah Association of Governments, May 14, 1984

Projected Impacts

The employment level at the Deer Creek Mine Complex will remain constant throughout the life of the mine; therefore, there will be no primary or secondary socioeconomic impacts associated with the continued operation of the facility. The mine currently supports approximately 600 secondary jobs in the region. The company contributes approximately \$650,000 a year in property taxes and \$400,000 a year in state unemployment benefits. The unemployment rate in the region has remained high throughout the early 1980's (nearly 15 percent); therefore, the mine provides a stable employment base for area miners.

United States
Department of
Agriculture

Forest
Service

Manti-La Sal
National Forest

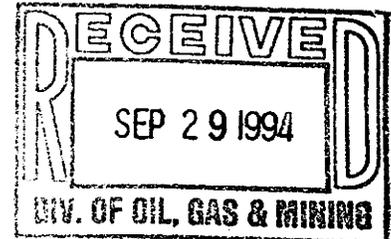
599 West Price River Dr.
Price, Utah 84501

DRAFT

Reply to: 2820

Date: September 27, 1994

Utah Coal Regulatory Program
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
Attention: Pamela Grubaugh-Littig



RE: Rilda Canyon Lease Extension and Surface Facilities, Deer Creek Mine,
PacifiCorp, ACT/015/018-94A, Folder #~~2~~₃, Emery County, Utah *Copy Pam (all)*

Dear Ms. Littig:

We hereby consent to addition of the extension area into the permit area for the Deer Creek Mine, construction of surface facilities in Rilda Canyon, and mining under the south canyon escarpment in Rilda Canyon by PacifiCorp. Enclosed are a copy of the Environmental Assessment (EA) and Decision Notice/Finding of No Significant Impact (DN/FONSI) for PacifiCorp's proposed surface facilities and mining under the south canyon escarpment. This approval is contingent upon the mitigations attached to the DN/FONSI.

The decision to consent to addition of the extension area is effective immediately, however, the decision to consent to surface facilities and to subside the escarpment is subject to Forest Service appeal regulations 36 CFR 215 and 271. Any appeals must be filed within 45 days of the date that the Forest Service decision is published in the Sun Advocate, which was September 27, 1994. Depending on the results of the appeal process, the earliest that surface operations may begin would November 21, 1994.

If you have any questions, contact us at the Forest Supervisor's Office in Price, Utah.

Sincerely,

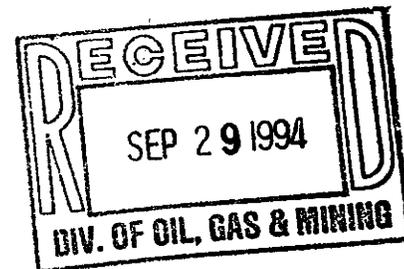
George A. Morris
for

GEORGE A. MORRIS
Forest Supervisor

Enclosures

cc:
D-3
Floyd McMullen, Office of Surface Mining
Val Payne, PacifiCorp

DECISION NOTICE
AND
FINDING OF NO SIGNIFICANT IMPACT



PACIFICORP DEER CREEK MINE SURFACE FACILITIES
AND
MINING UNDER THE CANYON ESCARPMENT
IN RILDA CANYON

USDA FOREST SERVICE, INTERMOUNTAIN REGION
MANTI-LA SAL NATIONAL FOREST
PRICE RANGER DISTRICT
EMERY COUNTY, UTAH

INTRODUCTION

PacifiCorp submitted a permit revision and mining plan to the Utah Division of Oil, Gas and Mining (UDOGM) proposing to construct a breakout with ancillary facilities in Rilda Canyon to provide ventilation of underground workings for the Deer Creek Coal Mine. The proposal would include construction of a facilities pad and new access road on Federal Coal Lease U-06039, reconstruction of the existing road in Rilda Canyon to accommodate project and public use, and installation of an overhead 25 KV power transmission line from the Huntington Power Plant in Huntington Canyon to the facilities pad. The facilities pad would contain 3 mine openings or portals, a fan at the easternmost of the three portals, a substation, water storage tank, and pumphouse.

In addition, the mining plan calls for mining beneath the south slope or escarpment of Rilda Canyon, including the lower reaches of the south slope of the Left Fork of Rilda Canyon on Federal Coal Leases U-06039, U-7653, U-47977, SL-050862, U-014275, and U-024319. The proposed mining (longwall method) would induce subsidence that could cause escarpment failures along the Castlegate Sandstone outcrop. Lease stipulations contain a restriction that prohibits underground mining that could cause the creation of hazardous conditions such as escarpment failures and landslides, unless specifically evaluated and approved. Specific evaluation and approval is required to prevent hazardous conditions and associated impacts.

The Forest Supervisor, Manti-La Sal National Forest, must decide whether or not to consent to construction of the surface facilities and mining under the canyon slope that could cause subsidence and potential escarpment failures. Consent authority is provided under the Federal Coal Leasing Amendment's Act of 1975, Surface Mining Control and Reclamation Act of 1977 and Federal Regulations 30 CFR 700 to end. If consent is given, the Forest Supervisor must identify any measures required for the protection of non-mineral resources. In addition, the Forest Supervisor must decide whether or not to issue the required special-use permit for the powerline on National Forest System lands under the Federal Land Policy and Management Act of 1976,

authorize Emery County to reconstruct Forest Development Road 50246 (Rilda Canyon Road) under a project agreement, and grant an easement to Emery County for operation and maintenance under the Federal Roads and Trails Act of 1964.

An Environmental Assessment (EA) was prepared for this proposal by the Forest Service with participation from the Bureau of Land Management and Office of Surface Management which were identified as cooperating agencies. The EA was tiered to the Final Environmental Impact Statement, Manti-La Sal National Forest (Forest Plan FEIS). The EA evaluated three alternatives which consist of (1) No Action, (2) the proposed action (plan as proposed by PacifiCorp) with required mitigations, and (3) a modified proposed action alternative that would not allow mining which would cause subsidence of the canyon slope/escarpment and potential escarpment failures. The analysis considered cumulative impacts to the ecosystems in Rilda Canyon, socioeconomic impacts, and concerns regarding maximum economic recovery of the coal resources in the area.

DECISION/RATIONALE (DECISION NOTICE)

Based on the analysis, I have decided to consent to the proposal by PacifiCorp with mitigations designed to mitigate the anticipated impacts (Alternative 2, Proposed Action with Mitigations). A copy of the required mitigations are included as Attachment 1. Implementation of this decision would include issuance of a special-use permit to authorize construction of the 25KV overhead powerline, and completion of a project agreement with Emery County for reconstruction of the Rilda Canyon Road (FDR 50246) currently under Forest Service jurisdiction (from the North Emery Water User's Association (NEWUA) springs to the Forks of Rilda Creek). Once this reconstruction is completed in accordance with the project agreement, an easement would be issued to Emery County, transferring jurisdiction of this road.

I feel that this alternative best meets the needs of the general public by providing a balance between recovery of Federal coal reserves in the area and preserving the integrity of the ecosystems in Rilda Canyon consistent with Forest Plan direction. It would provide for recovery of approximately 10.4 million tons of recoverable coal under the escarpment and necessary ventilation to safely mine reserves to the west. It would involve a low risk of causing long-term impacts to water quality and quantity in Rilda Creek and the North Emery Water User's Association culinary springs. It provides for up-front mitigation of possible impacts to the NEWUA culinary water supply (potential net benefit), and requires measures that would improve the condition of riparian vegetation in the RPN (Emphasis on Riparian Area Management) Management Unit to offset the estimated 2.4 acres of long-term loss of riparian vegetation in the RNG (Emphasis on Production of Forage) Management Unit. The potential public safety hazard is considered low because it is not likely that rocks would reach the Rilda Canyon due to distance, topographic factors, and vegetation.

The decisions required by the cooperating agencies in regard to the proposal will be documented in separate decision documents, released to the public, and appealable in accordance with that agency's specific regulations.

PUBLIC INVOLVEMENT

Scoping letters were sent to interested parties on May 5, 1994, that briefly described the proposal and requested public comment. A legal notice informing the public of the proposal and requesting public comment was published in the Sun Advocate (publication of record) on May 5, 1994, and the Emery County Progress (supplemental publication) on May 10, 1994. Two response letters were received during project scoping and a third letter was received during preparation of the environmental analysis. Emery County stated that they support the proposal. The Utah Division of Wildlife Resources expressed concern in regard to potential impacts to wildlife and riparian habitat in Rilda Canyon and suggested that measures be taken to mitigate habitat loss and improve riparian habitat in adjacent areas. In the third letter, Huntington-Cleveland Irrigation Company requested a copy of the EA for review when completed.

A copy of the EA was sent to potentially affected parties, and those who responded during project scoping or specifically requested a copy on August 4, 1994. A legal notice was published in the Sun Advocate and Emery County Progress on August 9, 1994 notifying the general public that the EA was available for public review for 30 days and that Alternative 2 was the Forest Service preferred alternative. Two letters were received as described below.

The Huntington Cattlemans Association stated that they protest construction of a fence at the mouth of Rilda Canyon in Huntington Canyon because this area has been grazed for many years and is spring range that is of vital importance to them. In a telephone conversation between District Ranger Jankiewicz and Lee Lemmon of the Cattle Association, it was explained that the fence would prevent grazing of approximately 7.6 Animal Unit Months (AUM) of approximately 4,512 AUMs provided in the Gentry C&H Allotment which has been determined to be an insignificant amount of use in a non-critical area. Lee stated that he would not object further but wanted to be on record as protesting the decision.

Craig Smith of Nielsen & Senior, representing the Huntington-Cleveland Irrigation Company, responded with a series of comments regarding potential impacts to water in the Huntington drainage. The comments and Forest Service responses are included in this document as Attachment 2. As discussed in the responses, I feel that the EA adequately addresses the concerns. The EA and Cumulative Hydrologic Impact Assessment (CHIA) show that the selected alternative would not have a significant impact to the hydrologic balance in Huntington Creek.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Based on the referenced EA for this project, I have determined that implementation of this project is not a major Federal action that would significantly affect the quality of the human environment. Therefore, the preparation of an Environmental Impact Statement is not required. This determination was made considering the following factors:

My decision and the resulting actions comply with direction of the Land and Resource Management Plan, Manti-La Sal National Forest, 1986, as amended (Forest Plan).

There are no anticipated significant effects on the quality of the human environment, either as an individual action, or as part of the cumulative effects of other past, present, and reasonably foreseeable actions within the Rilda Canyon area.

There would be no unacceptable hazards to public health or safety.

There are no highly uncertain, highly controversial, unique, or unknown risks.

There will be no adverse affects to districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. There will be no loss or destruction of cultural or historical resources.

There will be no adverse affects to endangered, threatened, or sensitive plant or animal species or their habitat, as documented in the Biological Evaluation in the project file.

The decision and resulting actions comply with other Federal, State, and local laws and requirements imposed for the protection of resources.

Mitigation measures specified in this Decision Notice will be monitored to assure that they are carried out as planned.

IMPLEMENTATION DATE AND MONITORING

Implementation of this decision may take place no sooner than November 21, 1994 which is the fifth business day following the end of the 45 day appeal period. See appeal rights discussed in the next section.

Monitoring of subsidence, flow and quality of water in Rilda Creek and the NEWUA springs is the responsibility of PacifiCorp under lease stipulations and requirements of the approved mining permit. Water monitoring information is submitted to the Utah Division of Oil, Gas and Mining on intervals specified in the Mine Plan. Subsidence monitoring results and an annual summary of hydrologic monitoring are submitted on an annual basis.

APPEAL RIGHTS

This decision is subject to appeal pursuant to 36 CFR Part 215.7 and Part 251.

Any written appeal under 36 CFR Part 215.7 must be postmarked or received by the Appeal Deciding Officer, Dale Bosworth, USDA Forest Service, Intermountain Region, 324 25th Street, Ogden, Utah 84401 within 45 days after publication of the Notice of Decision in the Sun Advocate Newspaper of Price, Utah (publication of record). The Notice of Decision will be published on September 27, 1994, therefore, any appeals must be filed on or before November 14, 1994. Appeals must meet the requirements of 36 CFR 215.14.

This decision is subject to appeal under 36 CFR 251, Subpart C. Any written notice of appeal submitted by the holder of a written instrument to occupy and use National Forest System lands must be fully consistent with 36 CFR 251.90 including the reasons for the appeal and must be filed on or before November 14, 1994. Notice of Appeal and statement of reasons must be submitted in writing to Dale Bosworth, USDA Forest Service, Intermountain Region 324 25th Street, Ogden, Utah 84401. Simultaneously send a copy of the Notice of Appeal to George Morris, Forest Supervisor, Manti-La Sal National Forest, 599 West Price River Drive, 84501.

Required decisions of the cooperating agencies would be subject to review and appeal specific to their appropriate regulations and are not appealable to the Forest Service as specified in the above paragraph.

George A. Morris

GEORGE A. MORRIS
Forest Supervisor

9-27-94

Date

MITIGATIONS

Operations are subject to adherence to the stipulations attached to the individual coal leases affected by operations and to provisions of the approved mine plan and permit. The mitigations listed below are in addition to those required by the leases or mine permit.

1. The permittee must construct a fence and cattleguard at in Rilda Creek at the east boundary of National Forest System lands to exclude livestock use on National Forest System lands in the canyon. Maintenance of this facility during the life of operations would be the operator's responsibility. This would prevent damage to the riparian vegetation and enhance the area for wildlife to offset the loss of riparian vegetation from facilities pad and road construction. The fence and cattleguard designs and specific location are subject to Forest Service review and approval.
2. The facilities pad must be fenced to provide for public safety safety and prevent access by livestock and big game species.
3. Facilities must be painted with a color that blends naturally with the surrounding environment. The color is subject to approval by the Forest Service.
4. In the event that rocks or other debris from the escarpment reach Rilda Creek and cause blockage or alteration of the natural flows, the operator will be required to remove the materials causing the blockage, take necessary measures to prevent sediment production, replace riparian vegetation through reclamation or other means, and re-establish the the natural flow patterns. The method of conducting these required activities are subject to approval of the regulatory authority with consent from the Forest Service.
5. Any damage to fences, roads, spring developments, etc. caused by escarpment failures or other operations must be repaired or replaced as soon as possible. Methods for repair of replacement of such facilities are subject to approval of the regulatory authority with consent from and Forest Service.
6. The permittee must take necessary measures to prevent raptors from building and occupying nests in the escarpment area during periods that they would be at risk from subsidence. Golden eagle nest 296A must be protected from subsidence unless the operator obtains a take permit from the U.S. Fish and Wildlife Service.
7. The permittee must monitor subsidence and escarpment areas to determine the extent of escarpment failures that occur and to determine when they stabilize. The operator is responsible to ensure public safety in the areas where escarpment failures are likely to occur until it is determined that subsidence is substantially complete

and the escarpments have stabilized. Methods of providing for public safety and for monitoring escarpment failures (including the frequency of monitoring) are subject to approval of the regulatory authority with consent from the Forest Service.

8. Should escarpment failures occur to an extent beyond that predicted and cause functional impairment of surface resources (impacts that are not consistent with management prescriptions in the Forest Plan), additional operations that could cause escarpment failures must be suspended pending evaluation by the regulatory authority in consultation with the Forest Service.
9. The permittee must provide final designs for the facilities pad access road that address stabilization of the cut and fill slopes, protection of the road from stream erosion, and measures to prevent materials from entering stream channels. Forest Service approval of the designs is required prior to implementation.

HUNTINGTON-CLEVELAND IRRIGATION CO. COMMENTS WITH FOREST SERVICE RESPONSES

The specific concerns (comments) in the September 7, 1994 letter are listed below (underlined), followed by the Forest Service response (September 15, 1994 letter to Craig Smith):

1. The EA should contain specific mitigation requirements for water quantity or quality impacts on ground and surface water. The requirements must be keyed and tailored to specific impacts on specific water sources and include how a particular impact will be mitigated.

In the process of conducting the environmental analysis, it was identified that the greatest risk of disrupting flow is from proposed longwall panels in shallow overburden (less than 500 feet) under the Left Fork of Rilda Creek. Due to the high potential for cracks to develop and potentially drain water from the alluvial aquifer, PacifiCorp agreed to drop these longwall panels from their proposal. Additional information would be required to determine how much of the total flow of Rilda Creek is contributed by this segment of the alluvial aquifer before the panels can be further considered for approval.

Our findings show that groundwater recharge is from the north of the canyon, the stream channel would be protected from subsidence, and there are no springs other than the NEWUA springs. Based on these findings, the only remaining concerns in regard to water quality and flow involve (1) sediment production from construction activities, (2) potential spills, and (3) effects to flow at the NEWUA springs. The proposal includes a sediment plan with best management practices for minimizing the production of sediment. Upon approval by UDOGM/OSM, operations would be subject to provisions already included in the approved Mining and Reclamation Plan, such as the spill contingency plan. Hydrologic data indicates that there is only low potential for mining on the south slope of Rilda Canyon to affect flow at the NEWUA springs because recharge is from the alluvial aquifer and the area north of Rilda Creek. Since the flow at the NEWUA springs is being diverted for culinary water, loss of flow in Rilda Creek is not likely. PacifiCorp has taken measures, specified in their agreement with NEWUA, to replace water in quality and quantity in the event that impacts occur. It is most likely that these measures would provide an overall net benefit to water users by providing up-front mitigation before mining occurs. Since this was part of the proposal and PacifiCorp has already committed to replacement of water in concept (pages 4-77, 4-78, and 4-83), there is no need for additional stipulations. These measures are adequately discussed and considered in the EA.

2. The EA fails to address the issue of how and where PacifiCorp intends to dispose of water encountered in its mining operations in the Rilda

Canyon area. Until this issue is addressed, it is difficult to provide comment.

The proposal does not request or provide for water discharge or disposal in Rilda Creek. A UPDES permit would be required by the State of Utah for any water discharge. Discharge of water into Rilda Creek was not raised as an issue by the public or participating agencies.

The EA addresses discharge of water encountered in the mine on page IV-18, paragraph 4. Water encountered during mining would be stored in the mine workings or discharged into Deer Creek under PacifiCorp's existing UPDES discharge permit. The facilities pad is designed to drain precipitation back into the mine workings, preventing the need for a sediment pond in Rilda Canyon that would result in additional surface disturbance. Considering geologic conditions in the area, there is no expectation that water encountered in the mine workings would drain from the Rilda Canyon portals once the workings are abandoned and surface disturbances are reclaimed.

3. A general stipulation prohibiting trans-drainage movement of water is also needed to prevent water encountered in the mine acres within Huntington Canyon being moved.

As discussed in the EA, it was determined that groundwater recharge of the springs and alluvial flow in Rilda Creek is mostly, if not all, from the north because of the southerly dip of the rock layers. Very little water has been encountered in the development workings on the south side of the canyon. Due to the dip of the rock layers and small amount of water encountered in this area thus far, it is not likely that flow in Rilda Creek would be diverted. Any water encountered in the mine workings would be stored in the mine or discharged into Deer Creek that would drain back into Huntington Creek. Under the UPDES permit, water discharged from the mine must meet State water quality standards.

Underground mining would not likely divert a significant amount of surface flow from precipitation/runoff from the south slope of Rilda Canyon into the groundwater regime.

4. It is of particular concern that this EA has been prepared and issued without the benefit of the final approved Probable Hydrologic Consequences (PHC) or the preparation of a Cumulative Hydrologic Impact Analysis (CHIA). It is stated on page III-6 of the EA that the PHC is being analyzed and the CHIA is being prepared. Without these important hydrological documents, the EA is premature. The EA should not be issued until after the public has an opportunity to review the Division of Oil, Gas & Mining's review of the PHC and CHIA. This is not merely a procedural issue, but a substantive one. Huntington-Cleveland believes that the PHC understates the scope and nature of impact that the mining activities of PacifiCorp will have. Specifically, it is believed that mining in Rilda Canyon will disrupt nearby springs in Huntington Canyon as well. This potential impact cannot be seriously discussed without the final CHIA.

There is no requirement that the CHIA be completed prior to conducting an environmental analysis for a project, however, the EA was completed as a parallel and coordinated process with the Division's review of the PHC and preparation of the CHIA. The hydrologist that has the lead for preparation of the CHIA participated as an interdisciplinary (ID) team member for preparation of the EA, representing OSM. The purpose of the statement in the EA (page III-6) was to reference the CHIA and show that the evaluations are consistent. The EA substantively discloses the hydrologic impacts and resulting cumulative effects related to mining south of Rilda Canyon that are contained in the CHIA. Development and review of the PHC has been ongoing for several years.

Forest Service decision regarding consent will be based on the results of the EA. Before the Department of Interior Assistant Secretary, Lands and Minerals Management (ASLMM) can approve the proposal, the Office of Surface Mining must have the EA, the Forest Service consent decision, and CHIA, as well as other required documents.

5. Another area of general concern is the total lack of any required mitigation for surface and groundwater impacts in the EA. A telephone discussion of this issue with Forest Service officials revealed that the Forest Service is relying on general stipulations found in the Forest Plan. We believe that this approach is insufficient to address impacts on ground and surface water.

PacifiCorp has been monitoring the hydrology in the Rilda Canyon area for several years to collect data for the PHC and CHIA. The Mining and Reclamation Plan includes provisions for hydrologic monitoring (Volume 9, Appendix A), and for replacement of water (pages 4-77, 4-78, 4-83, and Volume 9, Appendix G). In addition, the affected Federal Coal leases contain a stipulation that requires replacement of water in quality and quantity in the event that it is lost due to mining. All operations within the leases are subject to these stipulations.

Appendix 3 of the EA contains stipulations. In the first paragraph, it is stated "Operations are subject to adherence to the stipulations attached to the individual coal leases affected by operations and to provisions of the approved mine plan and mine permit". Since these provisions are already in place and PacifiCorp's proposal contains a commitment consistent with this stipulation, there is no need to specify their inclusion again. As stated in our response to your first comment, the proposal for operations in Rilda Canyon contains specific mitigations that have already been initiated to replace water if monitoring detects effects that can be attributed to mining.

The hydrologic monitoring plan includes monthly monitoring of water flow at the Right Fork surface well (RCF1), just below the springs in the main channel of Rilda Creek (RCF3), and the mouth of Rilda Creek (RCW4). The flow at the NEWUA springs is monitored monthly. The

monitoring wells (P1, P3-7) near the springs will also be monitored on a monthly basis. Quality is monitored at these stations quarterly.

6. Finally, a follow-up and enforcement mechanism needs to be implemented whereby impacts, if occurring, will be identified and mitigation required. Currently, there is no such mechanism and impacts beyond those predicted are not addressed.

PacifiCorp has already done extensive detailed monitoring of the hydrology in Rilda Canyon. They have committed to a comprehensive monitoring program to detect impacts to water quality and quantity. The results of monitoring must be submitted to the Utah Division of Oil, Gas and Mining within a certain time frame after it is collected. Enforcement of the mine plan provisions and mining regulations is a responsibility of the Division. The Forest Service does not have funding and personnel available to review all monitoring data. We are, however, notified by the operator and/or the Division if impacts are detected. It is our policy to cooperate with the Division in their enforcement of any applicable stipulations. If you feel that additional monitoring should be accomplished, we would encourage you to enter into an agreement with PacifiCorp to cooperate in their monitoring effort or to conduct independent monitoring. If you wish to do so, please contact Charlie Jankiewicz, District Ranger, to make necessary arrangements to conduct this work.

ENVIRONMENTAL ASSESSMENT

PacifiCorp Deer Creek Mine Surface Facilities
and
Mining Under Canyon Escarpments
in Rilda Canyon

USDA Forest Service
Intermountain Region
Manti-La Sal National Forest
Price Ranger District
Emery County, Utah

August, 1994

Responsible Officials:

GEORGE A. MORRIS
Forest Supervisor
Manti-La Sal National Forest
599 West Price River Drive
Price, Utah 84501

ROGER ZORTMAN
District Manager
Bureau of Land Management
Moab District
P.O. Box 970
Moab, Utah 84532

Cooperating Agencies:

Bureau of Land Management

Office of Surface Mining

For Further Information
Contact:

Charlie Jankiewicz
District Ranger
Price Ranger District
599 West Price River Drive
Price, Utah 84501
(801) 637-2817

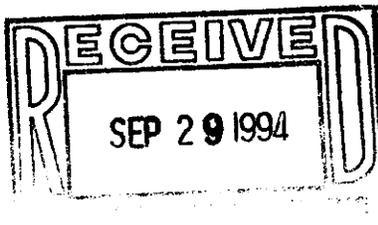


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CHAPTER I
PURPOSE AND NEED FOR ACTION

I. INTRODUCTION

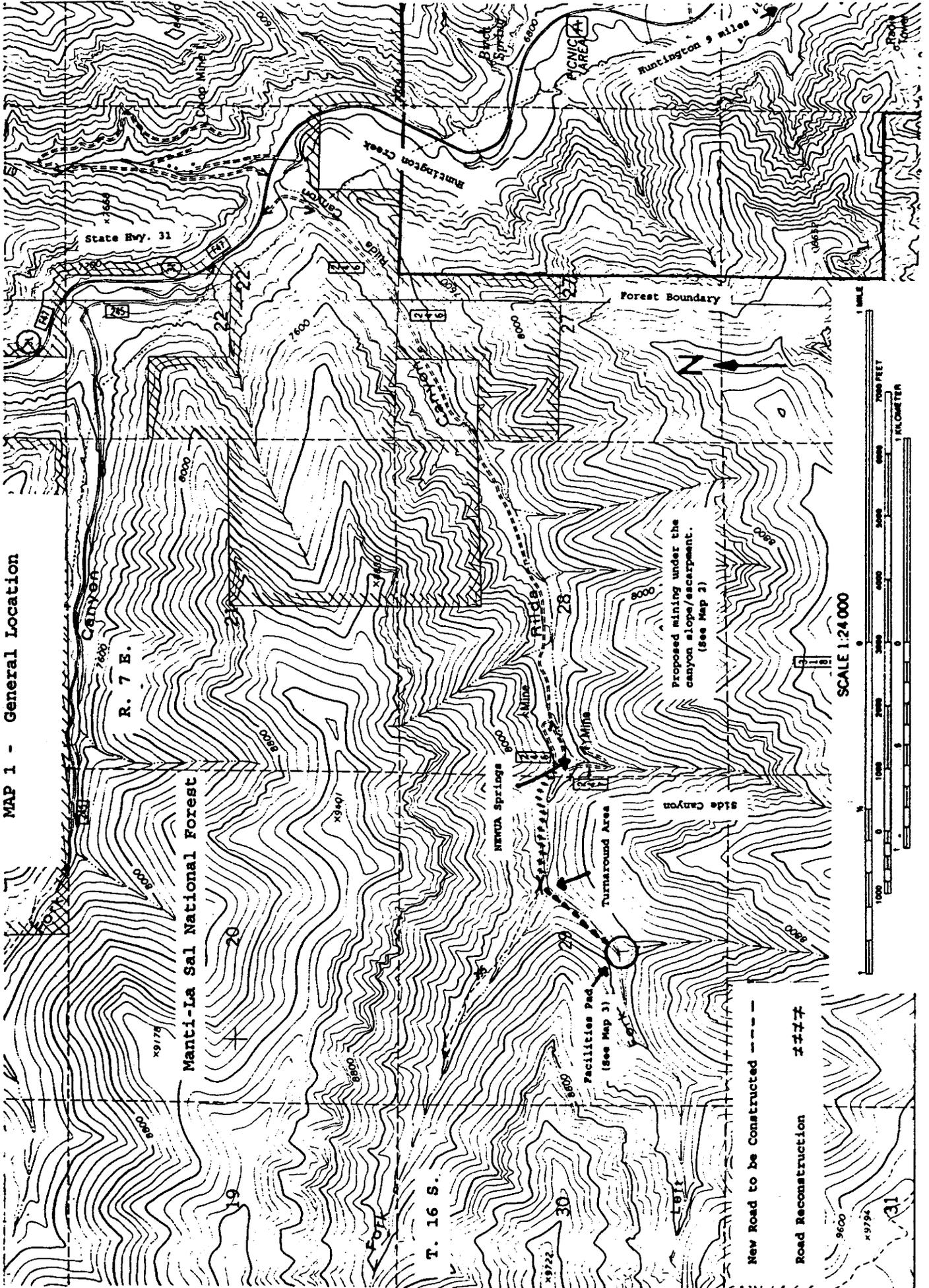
PacifiCorp submitted a permit revision and mining plan to the Utah Division of Oil, Gas and Mining proposing to construct a breakout with ancillary facilities in Rilda Canyon for the Deer Creek Mine. The purpose of the breakout is to provide intake and exhaust portals for ventilation of underground workings. The proposal would include construction of a facilities pad and new access road on Federal Coal Lease U-06039, reconstruction of the existing road in Rilda Canyon to accommodate project and public use, and installation of an overhead power transmission line (Maps 1 and 3).

PacifiCorp has also proposed to mine beneath the south slope (escarpment) of Rilda Canyon (below the forks) and the Left Fork of Rilda Canyon on Federal Coal Leases U-06039, U-7653, U-47977, SL-050862, U-014275, and U-024319 which would cause subsidence of this area (Maps 1 and 2). The purpose is to maximize production of coal resources and extend the life of the Deer Creek Mine. Stipulations contained in the Federal coal leases proposed for mining contain a restriction that prohibits underground mining operations and surface subsidence that could cause the creation of hazardous conditions such as potential escarpment failures and landslides, unless specifically evaluated and approved. Specific evaluation and approval of mining under escarpments is required to prevent hazardous conditions and associated impacts, unless they can be mitigated to be consistent with Forest Plan goals and prescriptions.

The proposed facilities pad would be located on National Forest System lands in the Left Fork of Rilda Canyon administered by the Price Ranger District of the Manti-La Sal National Forest in Section 29, T. 16 S., R. 7 E., SLB&M, Emery County, Utah (Map 1). The new road for access to the facilities pad lies entirely on National Forest System lands in the left fork. Those portions of the existing Rilda Canyon road to be upgraded for this project are located in Rilda Canyon within the administrative boundary of the Manti-La Sal National Forest on Federal and private lands. The proposed powerline traverses National Forest System lands, private lands within and outside of the administrative boundary of the Forest, and public lands administered by the Bureau of Land Management, San Rafael Resource Area.

II. PURPOSE AND NEED FOR ACTION

The purpose of the proposed action is to maximize the recovery of coal reserves and the associated socioeconomic benefits. Mining under the escarpments would maximize recovery of the coal reserves within the associated Federal coal leases. The breakouts and ancillary facilities are needed to provide ventilation of the existing and proposed underground mine workings in the area and provide for the safety of the miners consistent with Mine Safety and Health Administration regulations.



MAP 1 - General Location

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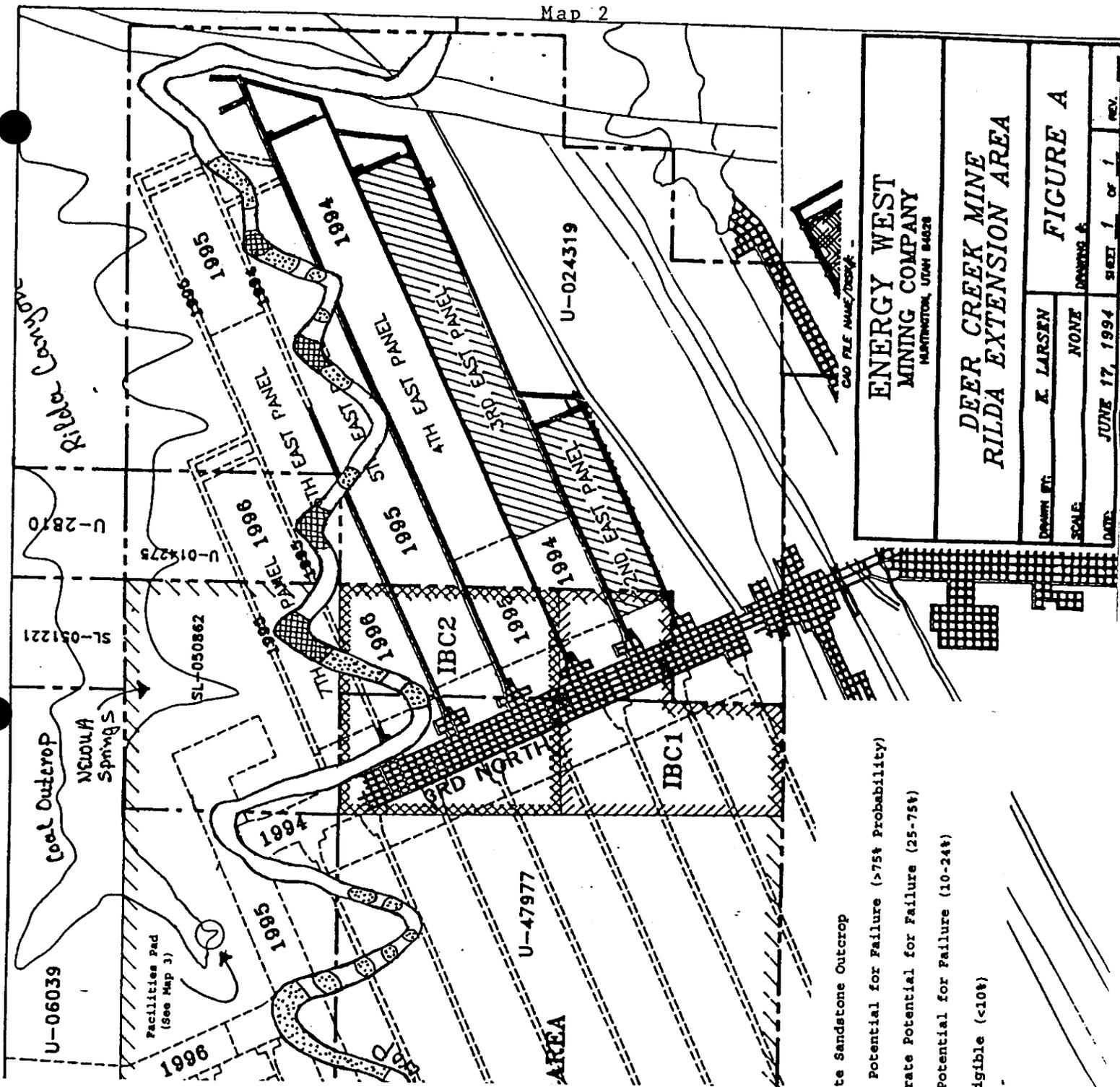
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te Sandstone Outcrop

Potential for Failure (>75% Probability)

rate Potential for Failure (25-75%)

Potential for Failure (10-24%)

igible (<10%)

ENERGY WEST MINING COMPANY
 HARTMANN, UTM 84028

**DEER CREEK MINE
 RILDA EXTENSION AREA**

DESIGNED BY:	E. LARSEN
SCALE:	NONE
DATE:	JUNE 17, 1994

FIGURE A
 DRAWING #
 SHEET 1 OF 1 REV.

The Bureau of Land Management, Office of Surface Mining, and Forest Service must evaluate the proposal and conduct an environmental analysis under the National Environmental Protection Act of 1969 and their specific authorities. The environmental analysis will be used by the agencies as the basis for making their respective decisions in regard to the proposed action and issuing required permits.

This analysis is tiered to the Final Environmental Impact Statement, Manti-La Sal National Forest, 1986 and the Final Environmental Impact Statement, San Rafael Resource Management Plan, 1988.

III. AUTHORITIES

The proposed action falls under the authorities of the Mineral Leasing Act of 1920, as amended (MLA); Surface Mining Control and Reclamation Act of 1977 (SMCRA); Federal Coal Leasing Amendments Act of 1975 (FCLAA); Federal Land Policy and Management Act of 1977 (FLPMA); National Forest Roads and Trails Act of 1964 (FRTA); Federal Regulations 43 CFR 3400 and 30 CFR 700 to end; Land and Resource Management Plan, Manti-La Sal National Forest, 1986; and San Rafael Resource Management Plan, 1988.

IV. PROPOSED ACTION

The facilities pad would contain 3 mine openings or portals, a fan at the easternmost of the three portals, a substation, water storage tank, and pumphouse. To provide the area needed for the facilities pad approximately 140 feet of the Left Fork drainage channel and 140 feet of a small side drainage would be channeled into culverts. Approximately 17,000 cubic yards of fill would be imported to cover the culverts and form the pad. A "Hilficker" type retaining wall would be installed to support a near vertical fill slope adjacent to the drainages to reduce the overall size of the area to be disturbed, protect the pad from erosion, and reduce sediment production. The northeast corner of the pad would be approximately 40 feet in elevation above the road. The facilities pad would disturb 1.2 acres.

The Rilda Canyon road (Forest Development Road 50246), from the North Emery Water Users Association springs (end of Emery County jurisdiction) to the forks of Rilda Canyon, would be reconstructed to a one-lane standard with turnouts and a 14 foot gravel surface. Improvement of the road would provide access adequate for PacifiCorp's operations and public use. A gravel turnaround/parking area would also be constructed at the Forks. The parking/turnaround area would provide parking and a turnaround area for recreational traffic in the canyon, mostly associated with the trails in the North and South Forks. The length of this existing road segment is 3,800 feet with a disturbed area of 2.4 acres. The road would be partially relocated resulting in an overall length of 3,500 feet with a final disturbed area of 4.2 acres. Approximately 1,000 feet of the old road would be contemporaneously reclaimed (0.6 acres). Net new disturbance after reclamation would be 1.8 acres. Emery County has applied for an easement across National Forest System lands to reconstruct

and maintain this road and the parking/turnaround area to meet the needs of PacifiCorp and Emery County. If approved, the work would be authorized under a project agreement between Emery County and the Manti-La Sal National Forest. Once the road is completed, an easement would be granted by the Forest Service to Emery County for operation and maintenance.

A new access road would be constructed along the north slope of the Left Fork from the end of Forest Development Road 50246 and the turnaround/parking area to the facilities pad, a distance of 1,350 feet. The road would follow the general alignment of an existing trail. It would be constructed to a one-lane standard with a 12 foot gravel surface. Access would be restricted to PacifiCorp personnel by construction of a gate. The new road would disturb 1.3 acres.

A new 25KV overhead powerline would be constructed from the Huntington Canyon Power Plant to the facilities pad in Rilda Canyon. The new line would be constructed parallel to the existing Mill Fork powerline in Huntington Canyon. The alignment would deviate from the existing line in Huntington Canyon near the mouth of Rilda Canyon and extend along the Rilda Canyon road on the north (uphill) edge to the facilities pad. The powerline would supply electrical power to the fan and pumphouse. The powerline would physically disturb only the areas where poles would be installed.

The new line would be constructed to a design that would protect raptors from electrocution. The existing line would be upgraded to be raptor safe.

V. SCOPE OF THE ANALYSIS

The scope of the analysis is confined to issues associated with the proposed action. The analysis considers the cumulative effects to specific components of the ecosystems and socioeconomic climate identified as issues.

The analysis is tiered to the Final Environmental Impact Statement, Manti-La Sal National Forest, 1986 (Forest Plan FEIS) and the Final Environmental Impact Statement, San Rafael Resource Management Plan, 1988.

VI. ANALYSIS AND DECISION CRITERIA

The powerline and road reconstruction would be located in MMA (Emphasis on Leasable Minerals Development), RNG (Emphasis on Production of Forage), and RPN (Emphasis on Riparian Area Management) Management Units. The new road and facilities pad would lie within the RNG Management Unit. The decision must be consistent with applicable laws and regulations, as well as Forest Plan forestwide management goals for the affected resources, and management prescriptions for the MMA, RNG, and RPN Management Units. Construction of the powerline across public lands administered by the Bureau of Land Management must comply with direction in the San Rafael Resource Management Plan (RMP).

The mine plan must be in compliance with the Surface Mining Control and Reclamation Act of 1977, Federal Regulations 30 CFR 700 to end, and the Utah Coal Rules, and MSHA (Mine Safety and Health Administration) regulations (30 CFR 1-199) for underground safety.

Surveys have been completed by qualified specialists in conformance with the National Historic Preservation Act and the Endangered Species Act and associated laws and regulations. It has been determined that the proposed action would not cause adverse impacts to cultural resources or Threatened, Endangered, and sensitive plant and animal species. Copies of the Biological Evaluation and Cultural Resources Survey Reports are included in the project file.

VII. DECISIONS TO BE MADE

The Department of the Interior Assistant Secretary, Land and Minerals Management (ASLMM) must decide whether to approve, conditionally approve, or disapprove the mining plan for Federal Coal Leases SL-050862, U-47977, U-7653, and U-06039 under the authority of the Mineral Leasing Act of 1920 (MLA). The Office of Surface Mining (OSM) must prepare a decision document for the ASLMM that recommends approval, conditional approval, or disapproval of the mining plan.

OSM's recommendation on the mining plan is based on (1) the complete permit application package, including the permit application and resource recovery and protection plan, (2) compliance with the National Environmental Policy Act of 1969, (3) documentation assuring compliance with applicable requirements of other Federal laws, regulations, and executive orders, (4) comments and recommendations or concurrence of other Federal agencies, and the public; (5) the findings and recommendations of the Bureau of Land Management with respect to the resource recovery and protection plan and other requirements of the Federal leases and the Mineral Leasing Act, and (6) the findings and recommendations of the Utah Division of Oil, Gas and Mining (DOG M) with respect to the permit application and the Utah State Program. The respective roles of OSM and DOGM are described in Appendix 4.

The Bureau of Land Management (BLM) must decide whether the mining operations proposed in the (changes to the) resource recovery and protection plan will achieve maximum economic recovery of the Federal Coal and whether the proposed operations are in compliance with the terms and conditions of the Federal leases, the Mineral Leasing Act of 1920, as amended, and 43 CFR 3400. The BLM must also decide whether to issue a right-of-way (FLPMA) for those portions of the proposed powerline that cross public lands administered by BLM.

The Forest Supervisor, Manti-La Sal National Forest, must decide whether or not to consent to construction of the surface facilities and mining under the canyon slope that could cause slope/escarpment failures. Consent authority is provided under FCLAA, SMCRA, and requirement for consultation with the surface management agency 30 CFR 700 to end. If consent is given, the Forest Service must identify required measures for the protection of non-mineral resources. In addition, the Forest Service

must decide whether or not to issue the required special-use permit for the powerline on National Forest System lands (FLPMA), and whether or not to authorize Emery County to reconstruct Forest Development Road 50246 under a project agreement and to grant an easement to Emery County for operation and maintenance of the road (FRTA). The Forest Supervisor must decide whether or not to allow new disturbance and use of facilities in the RPN (Riparian) Management Unit adjacent to perennial portions of Rilda Creek in conformance with management direction for RPN Management Units in the Forest Plan.

CHAPTER 2
ALTERNATIVES

I. INTRODUCTION

This chapter describes the issues identified during project scoping by the public and interdisciplinary team and the alternatives considered. A table that compares the alternatives in relation to the issues is presented. This table is a summary of the information on the effects of implementation from Chapter 4. Alternatives that were considered but not evaluated are described with an explanation of why they were not evaluated.

II. ISSUES

Letters were sent to potentially affected parties on May 5, 1994 (Appendix 1). The letters briefly described the proposed action and location, and specifically invited comments and identification of issues. A legal notice was published in the Sun Advocate of Price, Utah (publication of record) on May 5, and the Emery County Progress (supplemental publication) on May 10, that also briefly described the proposal and invited public comment. The letters and legal notices identified the close of the comment period as June 6, 1994.

Two letters were received in response to project scoping. Emery County stated that they support the proposal. The Utah Division of Wildlife Resources expressed concern in regard to potential impacts to wildlife habitat and riparian vegetation in Rilda Canyon, and suggested measures that should be taken to safeguard these values. The Huntington-Cleveland Irrigation Company responded by telephone on July 12, 1994, and requested that they be included on the mailing list to receive information on the proposal.

The interdisciplinary team reviewed the responses and identified the following issues:

- * Mining under the steep canyon slopes/escarpments could result in subsidence that could cause escarpment failures. Slope/escarpment failures could destroy existing vegetation along the slope, change the wildlife habitat, increase erosion along the slopes, and increase sediment in Rilda Creek. (Measured by area of disturbance and relative change in sediment production.)
- * Escarpment failures could present a safety hazard to people using the road in the bottom of the canyon and anyone hiking or hunting along the canyon slope. (Measured by relative safety hazard)
- * If the escarpment fails at the location of golden eagle nest #296A, the nest could be destroyed. It was last active in 1989 and has been inactive to the present. It was tended in 1991. (Measured by % probability of nest failure.)
- * Construction and operation of the new road and facilities and reconstruction of the existing Rilda Canyon Road would remove

approximately 4.3 acres of vegetation that could increase the amount of sediment production in Rilda and Huntington Creeks. Increased sediment could affect downstream water uses and the fishery in Huntington Creek.

- * Construction and use of the facilities would cause human activity that could displace spotted bats and goshawks. After construction is completed, the disturbance caused by vehicle access would be infrequent, however, the disturbance caused by exhaust fan noise would be constant. (Measured by area and duration of potential habitat loss)
- * The new powerline would be visible along the Rilda Canyon road. The pad facility would be visible along the trail in the South Fork of Rilda Creek. The additional powerline to be constructed along an existing powerline in Huntington Canyon could increase the visibility of these facilities. The proposed facilities would be consistent with the visual quality objectives for the area (modification, partial retention) but the visual quality would be decreased. (Measured by consistency with visual quality objectives and relative change in visual quality.)
- * The Recreation Opportunity Spectrum (ROS) classification for the area is Roded Natural Appearing. The project could decrease the quality of the recreation experience in Rilda Canyon due to the fan noise and visibility of facilities. (Measured by relative change in recreation use.)
- * Mining in the area and construction of the proposed facilities could affect flow and quality of North Emery Water User's Association's (NEWUA) springs in Rilda Canyon that lie approximately one mile downstream of the proposed facilities pad. (Measured by acres of disturbance and relative duration of sediment production.)
- * Mining and subsidence of escarpments could intercept ground water that contributes to ground and surface water flow in Rilda Creek. (Measured by potential for decreasing flow.)
- * Mining and surface facilities could decrease riparian vegetation and RPN (riparian) management units in Rilda Canyon. (Measured by area and duration of loss.)

III. ALTERNATIVES

A. Alternatives Considered and Evaluated

1. No Action - The No Action alternative must be evaluated for all proposals. Under this alternative the proposal would not be approved.
2. Proposed Action with Mitigations - Allow the surface facilities and mining under the escarpment as proposed with mitigation measures (Appendix 3) to minimize impacts.

3. Modified Proposed Action with Mitigations - Allow the surface facilities with mitigation measures (Appendix 3) to minimize impacts, but do not allow mining under the canyon slope/escarpment that is likely to cause slope/escarpment failures.

B. Alternatives Considered but Eliminated for Evaluation

1. Helicopter and Underground Access Only - Allow construction of the pad but do not allow improvement of the Forest Development Road from the NEWUA springs to the Forks or construction of the new road from the Forks to the facilities pad. The breakouts would be constructed from within the mine and all access to the pad would be provided through the mine workings and/or by helicopter. This would include providing electrical power to the fan and northern mine area by running a 25KV cable through the underground mine workings.

This alternative was eliminated from further evaluation because of the high costs involved for helicopter transport of the transformer, fan, and 17,000 cubic yards of fill material needed to build up the facilities pad and control erosion. In addition, the transformer and fan components are too large to be transported through the mine working, even when dismantled for transportation. According to PacifiCorp installation of a 25KV cable through the mine workings would present safety and economic problems.

2. Breakout at the Outcrop/Pipe Air to Facilities Down Canyon

Under this alternative the breakout would occur from within the mine with no road access. A pipe would be constructed from the breakout down-canyon to a facilities pad on an existing flat open area.

This alternative was eliminated from further evaluation because the pipe would need to carry 600,000 cubic feet per minute of air. This would require a concrete reinforced 8 ft. diameter pipe to prevent collapse under the suction within the pipe. It would also need to be anchored to the ground for stability. This would require the same level of disturbance as the proposed road. It would offer no practical environmental advantages with higher cost.

3. Mining of 4 Additional Longwall Panels in the Blind Canyon Seam (upper seam) and 1 Panel in the Hiawatha Seam (lower seam) Under the Left Fork of Rilda Creek.

PacifiCorp in their Probable Hydrologic Consequences (PHC) and the regulatory agencies have identified the potential for this mining to subside the channel, crack the ground surface, and drain water flowing through the alluvial aquifer into the mine workings or other permeable rock layers. Overburden in the area

ranges from 250 to 500 feet. This could decrease the flow of the NEWUA springs and the flow in Rilda Creek with impacts to other surface resources.

Data collected for the area is not sufficient to quantify the potential water loss downstream at the springs and in the perennial portion of the Rilda Creek. PacifiCorp withdrew their proposal to mine in this area and will initiate a study to collect the necessary data. Depending on the results of the study, PacifiCorp may or may not again propose to mine in this area.

IV. COMPARISON OF ALTERNATIVES

The following table has been generated to display the differences between the evaluated alternatives relative to the identified issues. Each issue is identified by heading with subheadings for the specific resources that could be affected. Comparisons are based on the potential effects to each issue by resource category. Parameters of measure used to compare alternatives are discussed for each issue are identified in the descriptions of the issues in Chapter 2, Item II. Refer to Chapter 4 for a detailed discussion of the environmental effects for resource categories by alternative.

TABLE 1, COMPARISON OF ALTERNATIVES

<u>ISSUE/RESOURCE</u>	<u>ALT. 1 NO ACTION</u>	<u>ALT. 2 PROP. ACTION W/MITIGATIONS</u>	<u>ALT. 3 MOD. PROP. ACTION W/MITIGATIONS</u>
Escarpment Failure			
Vegetation	No Effect	Long-term removal of <10 acres Spruce/Fir Coniferous Forest.	No Effect
Wildlife Habitat	No Effect	Long-term loss of <10 acres of forage and cover.	No Effect
Golden eagle Nest #296A	No Effect	Low potential (<10%) for loss of the nest.	No Effect
Increase Erosion and sediment prod.	No Effect	Temporary increase in erosion on barren slopes with some sediment production. (<10 acres)	No Effect
Surface Water Quality	No Effect	Temporary increase in sediment to Rilda Creek.	No Effect
Public Safety	No Effect	Low risk of rocks reaching the road. Low risk of personal injury due to low usage of the steep canyon slopes.	No Effect
Visual Quality	No Effect	Decrease in visual quality but would be natural appearing. Consistent with visual quality objectives.	No Effect
Mining under escarpments could intercept ground water.			
Flow at NEWUA springs and Rilda Creek could be decreased.	No Change (Low Potential)	Increased potential due to subsidence. (Low Potential)	No Change (Low Potential)

TABLE 1, COMPARISON OF ALTERNATIVES (Cont.)

<u>ISSUE/RESOURCE</u>	<u>ALT. 1 NO ACTION</u>	<u>ALT. 2 PROP. ACTION W/MITIGATIONS</u>	<u>ALT. 3 MOD. PROP. ACTION W/MITIGATIONS</u>
Escarpment Failures (Cont.)			
Riparian Veg./ RPN Management Unit	No Change (Low Potential)	Decreased flow could alter the riparian vegetation community species in Rilda Creek. (Low Potential)	No Change (Low Potential)
Wildlife Habitat	No Change (Low Potential)	Decreased flow could decrease habitat. (Low Potential)	No Change (Low Potential)
Construction and use of surface facilities.			
Wildlife (Terrestrial)	No Change	Human activity and fan noise could displace wildlife into adjacent areas. (1.5 sq. mi. Short-Term) (< 1 sq. mi. Long-Term)	Same as Alt. 2
Ground and Surface Water	No Effect	Any spills of fuel or other substances could pollute the NEWUA springs and Rilda Creek. Increase sediment in Rilda Creek during construction (4.3 acres new dist.).	Same as Alt. 2
Aquatic Wildlife	No Effect	Spills and sediment could affect macroinvertebrate populations/diversity.	Same as Alt. 2
Visual Quality	No Effect	Decrease visual quality in Huntington Canyon (powerline) and Rilda Canyon (road, powerline, facilities pad). (Consistent with visual quality objectives.)	Same as Alt. 2

TABLE 1, COMPARISON OF ALTERNATIVES (Cont.)

<u>ISSUE/RESOURCE</u>	<u>ALT. 1 NO ACTION</u>	<u>ALT. 2 PROP. ACTION W/MITIGATIONS</u>	<u>ALT. 3 MOD. PROP. ACTION W/MITIGATIONS</u>
Construction and use of Surface Facilities (Cont.)			
Recreation	No Effect	Decrease in visual quality and fan noise could decrease dispersed recreation quality in Rilda Canyon. (Potential slight decrease in use).	Same as Alt. 2
Riparian Vegetation/ RPN Management Unit	No Effect (Consistent with Mgt. Direction)	Approx. 4.3 acres of riparian vegetation (Narrow leaf Cottonwood/ dogwood community) would be removed for the life of operations. Temporary loss of an additional 0.6 acres. Condition of riparian vegetation in RPN Mgt. Unit below NEWUA springs could be improved by mitigations. (30 acres) (Consistent with Mgt. Direction)	Same as Alt. 2

CHAPTER 3
AFFECTED ENVIRONMENT

I. INTRODUCTION

This chapter describes the existing environment or conditions which could be affected by the proposed action and the alternatives described in Chapter 2.

II. FOREST PLAN/RESOURCE MANAGEMENT PLAN DIRECTION

This analysis is tiered to the Forest Plan. The surface facilities, road construction and reconstruction, and the upper portion of the power transmission line are located in the RNG Management Unit as designated in the Forest Plan. The lower portion of the powerline is located in an MMA Management Unit. A portion of the proposed reconstruction of the Rilda Canyon Road above the NEWUA springs would be located within an RPN Management Unit (defined as the area within 100 feet from the edge of perennial waters. Management emphasis in RPN units is on management of riparian areas and the component ecosystems. Management emphasis in RNG units is for the production of forage for livestock and wildlife. Management emphasis for MMA unit is production of leasable minerals (coal/oil and gas).

Management prescriptions for mineral operations in RNG units include:

- (01) Provide appropriate mitigation measures to assure continued livestock access and use.
- (02) Those authorized to conduct developments will be required to replace losses through appropriate mitigations, where a site-specific development adversely affects long-term production and management.

Management prescriptions for mineral operations in MMA units include:

- (01) Coordinate the various leasable mineral activities to minimize or eliminate conflicts.
- (02) Upon completion of the planned surface use, restore disturbed sites to their pre-disturbance conditions unless otherwise directed in the document authorizing use.

Management prescriptions for minerals operations in RPN units include:

- (01) Avoid and mitigate detrimental disturbance to the riparian area by mineral activities. Initiate timely and effective rehabilitation of disturbed sites.
- (02) No surface occupancy or use is allowed in riparian units, or within 200 feet of riparian units, unless it can be demonstrated that operations can be conducted without causing unacceptable

impacts, in which case, the restriction can be waived, accepted, or modified on a site-specific basis.

A portion of the powerline route crosses public land under the management of BLM. Analysis of this portion of the powerline route is tiered to the Resource Management Plan (RMP). Management objectives for powerline rights-of-way on BLM lands call for allowance of discretionary rights-of-way only as long as RMP goals can be met. The area in question calls for rights-of-way avoidance due to critical soils. Management prescriptions for areas of critical soils call for surface restrictions. However, the proposed powerline would parallel the existing Mill Fork line, which was granted prior to the RMP. The proposed powerline would meet the objectives of the RMP since the existing powerline has stabilized the critical soils with grading and seeding.

III. DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. General Setting, Topography and Geology

The project area is located in Rilda Canyon and East Mountain. Rilda Canyon is a deeply incised east-west trending canyon that is tributary to Huntington Canyon. It is one of the many canyons that drain the east slope of East Mountain and drain into Huntington Creek. Huntington Canyon is a deeply incised, broad, northwest/southeast trending canyon that dissects and drains the Wasatch Plateau.

Coal seams of the Cretaceous Blackhawk Formation in the Wasatch Plateau Coal Field crop out along the steep canyon slopes in both Huntington and Rilda Canyons. The outcrops provide access to the coal seams that extend throughout the plateau.

Rilda Canyon splits into two forks (Left and Right Forks) approximately 2.5 miles west of it's confluence with Huntington Canyon. The slope of the south canyon wall averages approximately 45%. The north canyon wall is considerably steeper, with considerable area of vertical cliffs.

Rock units exposed in the project area include (from oldest to youngest) the Cretaceous Mancos Shale, Starpoint Sandstone, Blackhawk Formation, Price River Formation, and Cretaceous/Tertiary North Horn Formation. The coal bearing Blackhawk Formation is approximately 900 ft. thick and consists of discontinuous interbedded shale and sandstone units. It is a slope forming unit exposed along the middle portion of the canyon wall in the project area. The cliff forming Castlegate Sandstone lies directly above the Blackhawk Formation. This is a massive sandstone unit that is approximately 250 ft. thick. It crops out along the upper 1/3 of the canyon slope/escarpment. In the potentially affected area on the south canyon wall it forms vertical cliff outcrops at prominent points between small side drainages (54% of the outcrop area). Rock falls are common at cliff outcrops where the joint systems are well developed. The remainder of the Castlegate Sandstone outcrop area is

either a vegetated slope consistent with the slope above and below (35%) or rock rubble areas with minor cliff development (11%). The topography along the plateau top flattens forming a series of rounded ridges between canyons.

B. Coal Occurrence, Reserves, and Mining

The Wasatch Plateau (Manti Division, Manti-La Sal National Forest) contains vast reserves of mineable low sulfur bituminous coal in the Cretaceous Blackhawk Formation. Mining has occurred in the area since the late 1800's and is presently the dominant component of the economies in Carbon and Emery Counties. Coal mining is also an important component of the State economy.

PacifiCorp presently operates the Deer Creek Mine that is located in Deer Creek, approximately 4 miles southeast of the proposed new facilities. The approved permit area for the mine encompasses most of the southern and central portions of East Mountain. PacifiCorp also controls the coal leases in the Rilda Canyon area that are being evaluated for inclusion in the permit/mine plan area by the State of Utah Division of Oil, Gas and Mining and the Office of Surface Mining under SMCRA, MLA, Utah Coal Rules and other applicable Federal laws. PacifiCorp also operates the Cottonwood/Wilberg Mine located in Grimes Wash, approximately 6 miles south of the proposed facilities. The permit areas for the two mines overlap in the southern portion of East Mountain with the lower seam being mined through the Cottonwood Mine. In 1993 the Deer Creek Mine produced 3.2 million tons of coal and the Cottonwood/Wilberg Mine produced 2.8 million tons.

The coal produced from the PacifiCorp mines is transported to the Huntington Plant in Huntington Canyon, the Hunter Plant near Castle Dale, and the Price Plant in Price Canyon north of Helper. The coal is used to generate electricity transmitted to locations in Utah, Nevada, and California.

Coal reserves in the south Rilda Canyon area occur in two minable seams, the Blind Canyon (upper) seam and the Hiawatha (lower) seam. Portions of 6 proposed longwall panels in the Blind Canyon seam and 4 proposed longwall panels in the Hiawatha seam lie under the escarpment and the associated 15 degree angle-of-draw subsidence zone. It is estimated that this area contains 10.4 million tons of recoverable coal.

C. Transportation/Special Uses

Approximately 436 acres of the land is in private ownership within the Rilda Canyon drainage. The canyon area is served by two Forest Development Roads, FDR 50246 the Rilda Canyon Road for approximately 2.4 miles, FDR 50247 an unnamed road for approximately 0.4 miles, and one designated trail Forest Development Trail (FDT) 295 for approximately 0.6 miles (inventoried).

The road being considered for reconstruction to provide improved access to the facilities pad is FDR 50246 the Rilda Canyon Road. Only that portion of this road from the NEWUA springs to the Forks of Rilda Canyon would need to be reconstructed because Emery County is already in the process of reconstructing this road from the Huntington-Fairview Highway (State Hwy. 31) to the springs. Approximately the first one mile (from Hwy. 31) is under jurisdiction of Emery County. The remaining 1.4 miles is under Forest Service jurisdiction. Emery County is in the process of replacing the existing one-lane bridge across Huntington Creek on private land with a two-lane bridge and reconditioning the traveled way and shoulder to provide for placement of a gravel running surface. The purpose of reconditioning this portion of road is to provide improved access to the NEWUA springs and to decrease erosion and maintenance costs. Damaged drainage structures and additional drainage features are being placed to remove water from the travelway and prevent ditch and embankment erosion. The travelway is being reconditioned to two 10-foot lanes through the first 2.1 miles (including 1.1 miles of County and 1.0 miles of Forest Service). This work would stay within the roadway limits except for the last 0.25 miles where curve widening and minor realignment is needed. A slight increase in existing traffic volumes could result.

The Road Management Objective for FDR 50246 is to provide a single lane native surface road to provide for high clearance vehicles at traffic service level "D" and operation maintenance level "2". The road is restricted to commercial haul by permit only. The expected intermittent use period is June 1 to October 30. Traffic prior to any mine facilities or timber utilization is expected to remain below 5 vehicles per day, with use by NEWUA averaging 3 to 5 trips per week. The area was identified in the Forest Plan for a coal production portal with potential for removal of 1 to 3 million tons per year.

Special-uses in the canyon include the culinary water springs under permit to NEWUA and water monitoring wells under permit to PacifiCorp (See discussions on ground and surface water below).

D. Surface Hydrology/Watershed

Rilda Creek is one of several east-west trending drainages that drain the east flank of East Mountain into Huntington Creek. Typical of the area, the erosive action of Rilda and Huntington Creeks has gouged deep canyons in the Wasatch Plateau. Huntington Creek is tributary to the San Rafael River. The San Rafael River drains into the Green River which in turn drains into the Colorado River.

The entire Rilda Creek watershed encompasses about 5,139 acres. Approximately two miles up from the confluence with Huntington Creek, Rilda Creek branches into the Left and Right Forks. The Right Fork watershed encompasses approximately 2,110 acres (3.3 square miles). The Left Fork watershed encompasses approximately 1,376 acres (2.2 square miles) which is about 40% of the watershed above the forks.

Rilda Creek has been determined to be perennial from the NEWUA springs to it's confluence with Huntington Creek. It is considered to be ephemeral above this point with water flowing underground in the alluvial system. Hydrologic monitoring and studies conducted by PacifiCorp indicate that ground water flows into the creek through east-west and north-south trending fracture or fault systems and alluvium. Alluvial fill in the drainage has been determined to be as thick as 75 feet in some areas. Only one other spring has been identified within the project area. This spring is located on the ridge between the Right and Left Forks. It is located at the contact between the Starpoint Sandstone and Blackhawk Formation. Water from this spring flows along the surface for only a short distance where it disappears underground into the alluvial material associated with the drainages.

During the monitoring period (1990-1992) there was no measurable flow in the Left Fork during 1990 and 1992. In 1991, the flow was measured from May through August with a peak flow of approximately 65 GPM at the end of May. Monitoring of the main channel above the springs showed that flow occurred during the months of May through June, with peak flow of 300 GPM in May and a base flow of 0.0 GPM during the months of January through April and July through December. Below the NEWUA springs, flow was monitored at two locations. Station RCF3 lies just below the springs. RCW4 lies in Rilda Creek just above it's confluence with Huntington Creek. During 1992 the peak flow occurring in June was 319 GPM for RCF3 and 402 GPM for RCW4. Base flows in 1992 were 9 GPM for RCF3 and 78 GPM for RCW4. Data suggests that the stream loses water to the alluvium above the springs. Flow again emerges to the surface at and below the springs.

Water quality is good and meets State water quality standards for parameters measured (for which standards have been developed). The predominant dissolved chemical constituents in tributaries to Huntington Creek are calcium, magnesium, and bicarbonate. During periods of base flow Danielson, ReMillard, and Fuller (Hydrology of the Coal-Resource Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Central Utah, U.S. Geological Survey Water-Resources Investigations Open File Report 81-539, 1981) found that concentrations of sulfate in water at the mouths of Deer Creek and Rilda Canyon were significantly higher than sulfate concentrations in water in Huntington Creek. Total dissolved solids concentrations in Rilda Creek (1976-1979) ranged from 292 mg/l (July 1979) to 503 mg/l (October 1979). PacifiCorp's monitoring data is consistent with these findings.

E. Ground Water Hydrology

The stream in the upper reaches of Rilda Canyon is limited to sub-surface flow in the alluvial deposits. In the upper reaches surface flow occurs in periods of excess precipitation or heavy snow melt, therefore the stream is considered to be ephemeral. Water

monitoring in Rilda Canyon continues to determine the quality and flow characteristics.

Ground water above the coal seams mostly occurs in discontinuous perched aquifers consisting of permeable fluvial sandstone channels in the North Horn and Blackhawk Formations. Additional water occurs throughout the Wasatch Plateau in the Starpoint Sandstone and lower portions of the Blackhawk Formation. The USGS (Lines, Open File Report 84-067) reports that this is a regional aquifer known as the Blackhawk-Starpoint regional aquifer. PacifiCorp contends that ground water on East Mountain, other than stored water, only exists within this zone in areas of secondary permeability caused by fractures and faults because of the low permeability of the Starpoint sandstones and siltstones. Recharge is in higher elevations of the Wasatch Plateau. Snowmelt runs off as surface water and some enters the ground water regime through fractures in the Flagstaff Limestone, faults and fractures, and other permeable zones. It flows vertically until it becomes perched by impermeable rock layers and continues to flow laterally or becomes trapped as stored water. Since the rock layers in the area dip to the southeast, it is expected that recharge is from the north and west.

The Division (State of Utah Department of Natural Resources, Division of Oil, Gas and Mining) is currently analyzing PacifiCorp's PHC (Probable Hydrologic Consequences) determination for the East Mountain property which includes Rilda Canyon. Of particular interest are the culinary springs located in Rilda Canyon which are used by NEWUA. The East Mountain CHIA (Cumulative Hydrologic Impact Analysis) is being prepared by the Division and is scheduled to be completed in summer 1994.

Springs inventoried within the Rilda Canyon area include a spring that issues along the point of the ridge between the Left and Right Forks of Rilda Creek (PacifiCorp 80-50) and the NEWUA's springs that lie near Side Canyon approximately 1/2 mile downstream of the confluence of the left and right forks.

Spring 80-50 issues from the contact between the Blackhawk Formation and Starpoint Sandstone. It was last monitored in August of 1980 with a flow of 3 gpm.

The NEWUA springs were developed as a culinary water source to provide water to northern Emery County, currently serving 410 connections. They are located at the Starpoint Sandstone and include three distinct groups of springs (Side Canyon Springs, North Springs, and South Spring). The Side Canyon springs are located in Side Canyon and issue from the Blackhawk/Starpoint contact. The North Springs and South Spring are located immediately above the stream channel on the south slope of Rilda Canyon at the the confluence of the South Canyon and Rilda Creek.

Water monitoring wells were installed in the vicinity of the NEWUA springs and pump tests were conducted to determine water sources near these springs and volumes. Hydraulic conductivity of these alluvial

materials was calculated at a low of 6,100 up to 35,900 gallons per day per square foot. An average long-term transmissivity of 20,000 gallons per day was derived from these pump tests by averaging the various drawdown curve methods (See Volume 9A of the PacifiCorp PHC for complete pump tests report).

Resistivity surveys were also conducted along the canyon bottom and along several cross sections to identify geologic structures and other water bearing strata. Fractures in the rock strata provide rapid secondary porosity and serve as conduits for ground water movement. Many water producing fractures or anomalies were identified. These may contribute a portion of the flow to the springs and the stream.

Based on the well tests and the resistivity investigations, the water sources contributing to the NEWUA springs and the stream's base-flow are believed to originate from the alluvial deposits, a north-south trending fault or fracture system just west of the NEWUA springs, and an east-west trending fault or fracture system that lies to the north of the canyon floor.

Monitoring of flows in the NEWUA springs at the collection system meters from September 6, 1990 through April 7, 1992 shows a total maximum flow of 267.5 gpm on July 17, 1991 and a minimum flow of 61.7 gpm on April 7, 1992. Historical data shows a maximum flow in August 1987 to be just above 400 gpm and a minimum flow of 50 gpm in December/January of 1978. This data shows that maximum annual flows occur in July and August and minimum flows occur in November and December. The South Canyon Spring and South Spring contribute only a small proportion of the overall flow.

Ground water quality is good in strata above the highly saline Mancos Shale. The USGS reports a range in TDS (total dissolved solids) from 50 to 750 mg/l for samples from 140 springs in the region issuing from the Starpoint Sandstone and overlying formations (Danielson et. al., 1981). They also identified a regional trend of decreasing water quality from north to south and west to east across the Wasatch Plateau. Waters percolating through the underlying Mancos Shale quickly deteriorate, with TDS concentrations frequently exceeding 3,000 mg/l. PacifiCorp's monitoring confirms this information. The predominant dissolved chemical constituents of ground water from both surface springs and samples collected in the PacifiCorp mines are calcium, bicarbonate, magnesium, and sulfate. Concentrations of magnesium are normally about half the concentration of calcium. Sulfate concentrations are typically higher in water from springs issuing from the Starpoint-Blackhawk aquifer or confined aquifers intersected by mine workings.

Ground water in Rilda Canyon is of excellent quality and meets State water quality standards. PacifiCorp reports in the PHC that there are distinct groupings in regard to TDS concentrations and sulfate concentrations. These groupings indicate differences in the source of the ground water that reaches the surface at the NEWUA springs.

F. Vegetation

An inventory of the vegetation in the project area was conducted by Mt. Nebò Scientific for PacifiCorp in August-September 1990 with the report finalized in March 1994. The report contains a map of the vegetation communities and a description of each community.

According to the report, the vegetation on the north slope of Rilda Canyon is categorized as a Mtn. Brush/Salina Wildrye community. Vegetation along the south slope and along the ridge separating the left and right forks is categorized as a Spruce/Fir Coniferous Forest community. The vegetation along the canyon bottom, including the main channel and Left and Right Forks, is categorized as an Aspen/Fir/Dogwood community.

The Forest Service has categorized the vegetation in the canyon bottom to be a Narrow Leaf Cottonwood/Dogwood community which is considered to be a riparian community. The area within 100 feet of the edge of the perennial portions of Rilda Creek is managed as an RPN Management Unit under the Forest Plan with emphasis on management of the riparian area and component ecosystems. Rilda Creek is considered to be perennial from the NEWUA springs to the confluence with Huntington Creek.

The riparian vegetation diversity and density in the canyon has been altered by many years of man's activities including livestock grazing, diversion of water at the springs, recreation, timber harvest, and mining.

No Threatened, Endangered, or sensitive plant species have been identified in Rilda Canyon. The Biological Evaluation (BE) is contained in the project file.

G. Wildlife

The Rilda Canyon proposed project area is inhabited by a variety of wildlife species. Bear, cougar, deer, elk, birds, reptiles and amphibians are supported by habitats within the project area. The area is used as spring and winter foraging by deer and occasionally elk. Deer may also use this area for fawning. Raptors known to occur within the area include cooper's hawks, red-tails, sharp-shinned hawks, golden eagles, and a number of owl species. Within the Rilda Canyon area there are known cooper's hawk and golden eagle nesting and territory areas. Other terrestrial organisms present include bats, rodents, lagamorphs, upland ground birds, songbirds, coyotes, bobcats, and woodpeckers.

Listed threatened, endangered, and sensitive species that may occur in the area are bald eagles, northern goshawk, peregrine falcon, spotted bats, and northern three-toed woodpeckers. Bald eagles may occasionally pass through the area during winter migration. Northern goshawk and northern three-toed woodpecker are listed as sensitive species that may inhabit the project area. Surveys for the presence

of these species were conducted in June and July of 1994. No sensitive species were identified. A copy of the Biological Evaluation is included in the project file. No other threatened, endangered or sensitive species have been observed in the project area.

Riparian vegetation zones have been identified within the project area. These areas include the Right Fork and Left Fork of Rilda Canyon, and Rilda Creek. They provide important habitat for water dependent and terrestrial species. Even though Rilda Canyon Creek (a tributary to Huntington Creek which supports a number of fish species) is not an important fishery, it does have value for other aquatic resources. Rilda Canyon Creek supports aquatic invertebrates which are important to the fishery resources in Huntington Creek below and to terrestrial species which feed along the creek.

H. Visual Quality

According to the Forest Plan the proposed breakout facility, new access road, and a majority of the powerline and reconstructed road would be located in an area presently managed under the visual quality objective of modification. The term visual quality objective (VQO) may be defined as follows: A desired level of excellence based on physical and sociological characteristics of an area; refers to the degree of acceptable alteration of the Landscape.

Under the VQO of modification, management activities may visually dominate the original characteristic landscape. However, activities of vegetative and landform alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities such as structures and roads must remain visually subordinate to the proposed composition. Reduction in form, line, color, and texture should be accomplished in the first year or at a minimum should meet regional guidelines. More simply put; this broad objective allows for most forms of development associated with mining activities, however a reasonable attempt should be made to fit within the context of the natural surroundings as soon as is practically possible.

The reconstructed road and the parallel overhead powerline would also pass through a small portion (1/16 section) of Rilda Canyon that is presently managed under the VQO of partial retention.

Under partial retention, activities should remain visually subordinate to the landscape. Activities may repeat form, color, or texture; but changes in qualities of size, amount, intensity, direction, pattern, etc., should be accomplished as soon as possible after reconstruction/installation or within a minimum of the first year. In other words, partial retention objectives will also allow development associated with mining to occur, provided that revegetation, etc. restores disturbed areas to a natural appearing

condition. Mitigative steps to reduce visual contrast to an appropriate level should be accomplished right away or at most within a year of actual construction.

The area where the facilities pad is proposed is densely vegetated. It contains an evergreen screen that in concert with existing topography appears adequate enough to provide camouflage for long views year-round.

The road to be reconstructed on lands managed by the Forest Service in Rilda Canyon is not be visible from State Highway 31 which has been designated as a Scenic Byway.

There is an existing powerline in Huntington Canyon that leads from the Huntington Canyon Coal Fired Powerplant to Mill Fork and beyond over the ridge to Crandall Canyon (next canyon north of Mill Fork) to the Crandall Canyon Mine. The powerline in Huntington Canyon is highly visible from the Fairview-Huntington Highway (State Hwy. 31) which has been designated as a Scenic Byway. The proposed powerline would parallel the existing powerline. It would depart from the existing powerline just south of the Rilda Creek/Huntington Creek confluence where it would cross a small ridge, turn west, and proceed into Rilda Canyon.

I. Recreation

Recreation in this area is primarily limited to big game hunting during the autumn hunting seasons and occasional use by hikers and horseback riders during the summer months. According to the Manti-La Sal National Forest Land and Resource Management Plan the proposed breakout facility and approximately the upper one-half of the new access road would be located in an area designated as semi-primitive motorized. The remainder of National Forest System land through which the lower one-half of the new access road, the reconstructed road, and the overhead powerline pass would be within an area designated as roaded natural appearing.

The project area is located in a portion of Rilda Canyon that is used primarily as a corridor to access lands in the upper Rilda Drainage for big game hunting and to a lesser extent backpacking/hiking. Consequently, this route of access offers unrestricted recreational opportunities to the public and is managed accordingly. Safety would be a concern (although minimal) for those using the canyon near potential escarpment failures.

J. Socioeconomics

PacifiCorp is the lessee of the coal leases that encompass the Rilda Canyon area. Part of the south-east side of Rilda Canyon is in the Deer Creek Mine permit area. The west end of Rilda Canyon is not in the permit area and the proposal being evaluated is part of the process to obtain a permit to mine. However, the whole of the south

side of Rilda Canyon is analyzed in this EA due to the plan to mine under the escarpment of which a portion is permitted and a portion is not permitted. Approximately 10.4 million tons of recoverable coal lie beneath the escarpments on the south side of Rilda Canyon. This represents about 4 years of mine life. Another 16 million tons of recoverable coal in longwall panels and main entry development lie away from the escarpments but within the Rilda Lease Tract Extension area to be added to the Deer Creek Mine permit area. This represents another 6 years of mine life. The proposed ventilation fan would provide the needed ventilation requirements to access and mine the north property where potential reserves to the year 2015 are located. At current production and price of coal, over \$90 million in Federal royalty could be paid over the life of the mine serviced by the fan. These combined reserves could provide direct employment of about 300 miners for the life of the mine (year 2015). For this period, they would supply the coal requirements for the Huntington Power Station which generates 850 megawatts of electricity for the State of Utah. Indirect benefits to the economies of Carbon and Emery County are substantial as the direct economic state of these two counties are heavily dependent on the mining and burning of coal for energy production.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

I. INTRODUCTION

Chapter 4 discloses the potential environmental consequences that could result from implementation of the alternatives considered and evaluated. The environmental effects focus on the lands in the decision area and in some cases the surrounding lands.

This chapter discusses potential impacts by resource category in the same order that the resource categories are discussed in Chapter 3. Effects and consequences are described or grouped as follows:

Direct and Indirect (secondary) Effects - Direct effects are caused by the action occurring at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.

Cumulative Effects - Cumulative effects result from the incremental change over time where the action is added to other past, present, and reasonably foreseeable future actions (regardless of what agency or person undertakes such actions).

Consistency with Forest Plan/Resource Management Plan - This refers to the degree to which the implementation of an alternative conforms or conflicts with Forest Plan goals, direction, and goals.

The duration of impacts is often discussed in the following terms:

Long-term Effects - Effects that would be evident for a period of time that exceeds 5 years.

Short-term Effects - Effects that would be evident for a period of time not greater than 5 years.

II. AFFECTS OF IMPLEMENTATION BY RESOURCE/ALTERNATIVE

A. General Setting, Topography, Geology

Alternative 1 (No Action)

Under this alternative the surface facilities and mining as proposed would not be approved. The surface facilities would not be constructed and mining that would cause subsidence of the escarpments would not be allowed. The surface resources in Rilda Canyon would not be affected.

Alternative 2 (Proposed Action)

Under this alternative, the action as proposed would be approved with mitigations designed to minimize impacts. The construction and

operation of the proposed surface facilities would result in surficial changes to the topography (approximately 4.3 acres). The changes would be long-term lasting for the duration of mining in the area. The life of operations is predicted to be approximately 20 years.

Mining under the escarpments would be completed using the longwall mining method. Underground workings would include development entries and longwall panels. Extraction of the longwall panels would induce fracturing and collapse of the rock layers above the workings and subsidence of the ground surface. Mining of two overlapping coal seams is proposed. Approximately 9 feet of coal in each seam would be extracted for a total of approximately 18 vertical feet of extraction. As observed on East Mountain to the south, the amount of surface subsidence could reach 70% of the extracted height (subsidence factor). The maximum subsidence is therefore expected to be 12.6 feet. The longwall method ultimately results in the development of a gradual and even subsidence trough. Subsidence begins almost immediately as longwall mining begins and progresses at the approximate rate of extraction. Cracks in the ground surface could occur at the flanks of individual panels within the zone of extensional forces. The potential for cracks to occur is higher in areas of shallow overburden in the escarpment areas. Due to the steep/uneven topography, the subsidence would not result in a perceptible change in the topography. Cracks that occur where there is unconsolidated colluvial cover are expected to heal after a few years.

Studies conducted by PacifiCorp and the Bureau of Land Management have been completed to determine the potential for escarpment failure to occur. A copy of BLM's report for this EA is available in the project file. Factors considered to contribute to mining induced escarpment failure are:

- * A pronounced escarpment or cliff formed by a thick section of Castlegate Sandstone along the rim of the canyon.
- * Longwall panels oriented parallel to the strike of the cliff.
- * A major set of fractures in the Castlegate Sandstone oriented parallel to the cliff face and longwall panels.
- * Talus slopes below the Castlegate Sandstone which are sparsely vegetated.
- * Convex cliff areas are zones of tension where tension cracks are more likely to occur and thus are more susceptible to escarpment failure. Conversely, concave cliff areas are zones of compression and thus are more stable.

It was determined that the highest potential for mining to cause spalling of the Castlegate Sandstone outcrop along the canyon slope or escarpment is at the prominent points (convex area with thick section of sandstone) between small side drainages that are within

the predicted subsidence (Map 2). The potential for failures has been determined to be moderate in these areas (25-75% probability of failure). Disruption of the already fractured sandstone and new fractures caused by subsidence could cause blocks of the sandstone to break-off from the outcrop and fall down the canyon slope. The BLM has determined that the potential for failure of the outcrop is low (10-25%) or negligible (less than 10%) in the remaining areas. It is not likely (low potential) that rock falls would reach the stream in Rilda Canyon or the Rilda Canyon Road because of the slope (45%), vegetation cover, and most likely travel path toward the side drainages. BLM estimates that less than (<) 10 acres would be disturbed by escarpment failure.

Alternative 3 (Proposed Action with Modifications)

The changes in topography from construction of the surface facilities described under Alternative 2 could occur. Since mining that would cause subsidence of the canyon slope and Left Fork of Rilda Creek would not be approved under this alternative, subsidence and changes to the topography in these areas would not occur.

B. Coal Occurrence, Reserves, and Mining

A discussion of how the alternatives could affect the recoverable coal reserves and life of the Deer Creek Mine is included in Section J, Socioeconomics.

C. Transportation/Special Uses

Alternative 1 (No Action)

Under this alternative the fan portal and new road in the Left Fork would not be constructed. Emery County would probably not reconstruct that portion of the road from the NEWUA springs to the forks and construct the turnaround area. This segment of the road would remain under Forest Service jurisdiction and maintenance.

Emery County is reconditioning and stabilizing the Rilda Canyon Road and realigning portions of roadway to a double lane width below the springs. This project lies within private lands and a road corridor on National Forest System lands under Emery County jurisdiction (Revised Statute 2477). A USDA easement will be granted on Forest Service segments to recognize and record their jurisdiction. They will become the primary operator. Construction of the new bridge and approach will result in new disturbance near Huntington Creek. This disturbance is on private lands and easements held by Emery County. This work will result in safer approaches to the highway and safer crossing of Huntington Creek. The bridge meets highway safety standards for sub-structure, super-structure, and deck. The hardening of the travelway and ditches will reduce sediment from run-off and dusting of the native surface. The armored fill

embankments will be stable during high stream flows. Present erosion rates would be reduced.

Reconditioning will require disturbance of approximately 0.2 acres of National Forest System lands to widen two sections of approximately 250 feet each in order to provide for two 10 foot finished surface lanes. The placement of enzyme stabilized aggregate on the recondition roadway will reduce the production of sediment from dust and run-off. The eroding cut ditch will be stabilized in steep grade section to reduce erosion and embankment within the flood plains will be armored to reduce erosion. The season of use will be extended for the forest user. NEWUA will have more dependable access to their springs. Maintenance costs and user cost will be reduced. Safety will be improved. Forest Service maintenance responsibilities and costs will be reduced.

Alternative 2 (Proposed Action)

The following would occur in addition to reconditioning of a portion of the Rilda Canyon Road discussed under Alternative 1.

The 1,426 feet of new road from the forks to the proposed portal would be constructed along the alignment of the crude trail and remnants of 4 wheel jeep trail in the Left Fork of Rilda Canyon. This trail parallels the drainage course and sets near the base of alluvium or colluvium deposit on the north slope of the canyon. The proposal is to provide a travelway of 12 feet, hardened with 6 inches of aggregate. Natural drainage would be conveyed in culverts and roadway drainage would be collected in ditches and crossed in culverts. The road would be gated and the traffic controlled, so no additional turnouts would be constructed in this restrictive section. The proposal indicates cut slope construction of 3/4:1 in the colluvium or alluvium deposit under the cliff forming sandstone/shales. The fill slope and the flood plain bound one-another along 40% of the proposed construction, from station 0+00 to 3+00, from 6+00 to 7+40, and from 9+50 to 11+00. The proposed grade is in excess of 8% from 0+91 to 6+50. The proposed traffic would be approximately 10 to 20 vehicles per day during the construction and reclamation periods. During the remaining periods the use is predicted to be below 1 vehicle per week. The six inches of aggregate should provide for adequate running surface for the proposed construction and reclamation traffic, if use is restricted to dry season (June 15 to October 1) when sub-grades are not saturated. The proposed cut slopes in colluvium or alluvium deposits would likely continue to ravel or sluff if unsupported and would require constant maintenance in order to assure a open travelway. There is almost no potential to re-establish vegetation on the cut slope of 3/4:1. Required support would mitigate this impact. Over the life of the mine portal, flood flow can be expected that could endanger the fill slopes. Required riprap would protect the fill slopes and prevent excessive sediment production. Less than 1.3 acres would be disturbed by the proposed roadway construction.

Emery County would upgrade the Rilda Canyon Road from the springs to the Left and Right Forks of Rilda Creek. Approximately 3,800 feet of existing 12 foot wide single lane road with natural turnouts and no permanent drainage structures would be improved. The roadway now affects approximately 2.4 acres. Work would consist of re-alignment of approximately one-third of the existing road to improve grades, sight distance, stability, and drainage. The improved road would be 3,500 feet in length with a single lane 14 foot finished travelway width. The travelway would be stabilized with 6 inches of aggregate. Both natural and roadway drainage would be carried across the road in culverts. Embankments and drainage structures within the flood plain would be armored with riprap. Turn-outs would be constructed and stabilized along the travelway at horizontal and vertical curves to improve safety. Approximately 4.2 acres would be within the roadway limits and about 1,000 feet of old roadway would be reclaimed. Approximately 260 feet of riprap armor would be placed along embankments. There would be a short-term increase in erosion/sediment during the construct period and for a short time after, then a long-term decrease in erosion/sediment would result because of the hardening of the travelway with gravel, removal of natural and surface water via culverts, and hardening of embankments with riprap. The proposed increase in traffic could be accommodated with increased safety and reduced sediment yield. The traffic could be supported during the current season of use and the use of light vehicle traffic could be extended earlier and later in the year.

Improvement of the road from the springs to the forks with a single lane travelway with turnouts and stable surface would allow passenger type cars access to the trailheads near the forks. Safety would improve by the construction of stabilized turnouts on vertical and horizontal curves rather than utilizing natural occurring non-stabilized open areas. The present primitive native surface travelway provides poor support for light vehicles during the fall hunting seasons when saturated from fall storms. Rutting from this use can concentrate water and increase sediment movement from the roadway to the drainages. Improvements to surface and ditches would reduce surface and ditch sediments. Additional culverts would reduce concentration of water and energy available to transport sediment. Armoring of the road embankment in the floodplains would reduce erosion during high runoff events. User cost and environmental costs would be reduced. The area of disturbance would increase by 2.4 acres, but 0.6 acres of this area would be reclaimed when road construction is completed for a long-term increase in the disturbed area of 1.8 acres.

Alternative 3 (Proposal with Modifications)

The impacts would be the same as discussed under Alternative 2 above since there would be no differences in the transportation situation.

D. Surface Hydrology/Watershed

Alternative 1 (No Action)

Under the no action alternative, the mining as proposed would not be approved. No underground mine development that could cause subsidence of the escarpment or surface construction would be allowed. Under this alternative surface water resources and the watershed in Rilda Canyon would not be affected beyond the impacts that could occur from already approved mining operations. The potential for development workings to affect the flow of the NEWUA springs and Rilda Creek is low because recharge is from the north and west and workings in this area have not encountered significant amounts of water.

Alternative 2 (Proposed Action)

Under this alternative, the proposal would be approved. This would allow for construction of the surface facilities and mining under the canyon slope/escarpments on the south slopes of Rilda Creek.

The water at the NEWUA springs and the flow in Rilda Creek have been identified for protection. Lease stipulations and provisions of the approved mining plan call for replacement of water in these sources if it is determined that mining adversely affects them.

PacifiCorp has entered into a formal agreement with NEWUA to construct a water treatment facility on land owned by PacifiCorp in Huntington Canyon, approximately two miles southeast and downstream of the Rilda Creek/Huntington Creek confluence, near the Huntington Power Plant. Water in the NEWUA culinary water system collected from the Rilda Canyon springs and other potential sources will be treated at this facility to mitigate any water quality impacts. Deep alluvial wells in this vicinity will be drilled to replace any loss of water at the springs.

Mining into the escarpment area and subsidence of the escarpment area could cause cracks and intercept ground water in fractures that could be contributing water to the NEWUA springs. The potential for affecting the flow is low because the majority of flow is attributed to alluvial water upstream of the springs and rock formations and fracture systems that lie to the north that would not be disturbed. There is, however, a low risk of decreasing the flow in the springs if there is any recharge from the south. This is most likely in the Side Canyon and South Springs that have the lowest flow of the three spring groups. If this occurs, there could be a corresponding decrease in flow in Rilda Creek. The potential for this to occur is also considered to be low. Development workings on the south slope have not encountered significant amounts of water, supporting that there is only a low risk of diverting ground water flow. If flow is diverted, it would remain underground and could be diverted into the mine workings and discharged back to the surface in Deer Creek or could continue to flow southward through the ground water system. It

is unlikely that water would be diverted from the Huntington Creek watershed or from the Colorado River system.

If subsidence results in rock spalling along the Castlegate Sandstone outcrop, there could be some short-term increase in sediment that could reach Rilda Creek. BLM estimates that less than (<) 10 acres would be disturbed.

Construction of the surface facilities would contribute to sediment in Rilda Creek. This would disturb approximately 4.3 acres of previously undisturbed ground. Best management practices required by the regulatory agencies and measures proposed by PacifiCorp would minimize the amount of sediment that would reach the drainage. This impact would be short-term lasting throughout the construction phase of operations. Once the facilities are completed, sediment control measures would be effective in controlling sediment produced and capturing sediment from the disturbed area on site. Sediment reaching the creek would be reduced from the present condition due to surfacing of the road (gravel), protection of the stream banks by riprap, and sediment control structures.

If there are any spills of diesel fuel or other potentially polluting substances during construction or operation of facilities, that are not adequately contained before they reach alluvial or surface water, water quality could be affected. The potential for this to occur is low and the duration of impacts would depend on the location of the spill, the timing and effectiveness of containment/removal actions taken, and the type of material spilled. PacifiCorp would be required to implement their Spill Prevention and Counter Control Plan in the event that a spill occurs.

Alternative 3 (Proposed Action with Modifications)

As discussed above under Alternative 2, there could be a short-term increase in sediment production due to construction of facilities and a long-term decrease in sediment in the creek due to measures for controlling erosion and sediment transport to the creek.

Under this alternative, mining that would cause subsidence of the escarpment areas would not be approved. The potential for mining to decrease the flow to the stream or springs associated would be minimized.

E. Ground Water Hydrology

Alternative 1 (No Action)

Under the no action alternative the mining as proposed would not be approved. Subsidence of the canyon slope/escarpment and construction of the surface facilities would not be approved. Mining in the area that has already been approved could alter the ground water system but the potential would be low. Based on the results of

hydrologic monitoring, impacts to the flow in Rilda Creek and the NEWUA springs should be minimal.

Alternative 2 (Proposed Action)

Under this alternative the mining would be approved as submitted. This would allow construction of the surface facilities and subsidence of the canyon slope/escarpments.

The mining of longwall panels under the canyon slope/escarpment would cause subsidence and cracks in the ground surface. The potential for the development of cracks is highest where the overburden is shallow. Overburden above the area proposed for mining ranges from 2,000 feet at the ridgetop to 250 feet near the coal outcrop on the canyon slope. Some water runoff during snowmelt and rainstorms could be diverted underground until the cracks heal and allow this water to continue downslope. Most cracks heal within a period of just a few years.

Mining under the escarpments and subsidence increases the risk of interception of water bearing fractures associated with the springs. PacifiCorp's studies of the hydrology indicate that alluvial water in the Left and Right Forks of Rilda Creek contribute the majority of flow to the NEWUA springs. Additional water has been attributed to north-south trending and east-west trending fracture systems that intersect near the springs. The geologic structure and dip of the rock layers indicate that recharge is mostly from the area north of Rilda Canyon. Since the proposed mining is on the south slope of the canyon, there is some potential that the flow in the springs could be affected but the potential is low. The potential for decreased flow is greater for the Side Canyon and South Springs. These springs contribute the least amount of flow of the three groups of springs.

Alternative 3 (Proposal with Modifications)

This alternative would allow the construction of the surface facilities with mitigation measures to minimize impacts but not approve mining under the canyon slope/escarpments that could cause subsidence and escarpment failures.

This would reduce the potential for interception of water filled fractures due to subsidence. Assuming that water filled fractures extend into the mountain from the outcrop, mining could still intercept these fractures and the water associated within them. The degree of potential impact would be approximately the same as for Alternative 2 (Proposed Action), which is low.

F. Vegetation

Alternative 1 (No Action)

Under this alternative there would be no changes to vegetation except for the 0.2 acres of disturbance associated with reconstruction of the Rilda Canyon from State Hwy. 31 to the NEWUA springs by Emery County.

The potential for flow in the drainage that could also cause indirect changes in riparian vegetation is low.

Alternative 2 (Proposed Action)

Under this alternative vegetation would be removed for construction of the new road, pad, and turnaround area, as well as for improvement (widening to a 14 foot travel surface) of the existing road. Vegetation would be removed from a 1.2 acre area for the facilities pad and 1.3 acres for the new facilities pad access road. Reconstruction of the Rilda Canyon Road from the NEWUA springs to the forks would disturb approximately 1.8 acres of additional lands. Approximately 0.6 acres of the old road (already disturbed area) would be reclaimed and revegetated. Long-term disturbance would be 4.3 acres. Additional short-term disturbance would be 0.6 acres.

PacifiCorp would be required to fence the canyon near the mouth to prevent livestock grazing in the perennial reaches of Rilda Canyon. This would improve the riparian vegetation condition and diversity in the associated RPN Management Unit to mitigate the loss of riparian vegetation from construction/operations. The RPN Management Unit extends 100 feet on either side of the perennial stream, on National Forest System lands, from the springs to the private lands downstream. This area encompasses a 1.25 mile length of stream and an approximate area of 30 acres.

If mining under the escarpments intersects fractures that provide water to the NEWUA springs, there could be some decrease in flow in the springs and downstream in Rilda Creek. This could result in some decrease in the width and diversity of the riparian community in and adjacent to the stream channel over the long-term. The potential is low because the potential for decreasing the flow is low and the stream receives water from several sources. Flows should continue sufficient to support the riparian vegetation community.

Subsidence induced spalling of the Castlegate Sandstone outcrop could result in sandstone blocks breaking away and tumbling down the slope. There could be some loss of vegetation (Spruce/Fir Coniferous Forest) along the slopes below the outcrop, depending on the area affected. BLM estimates that the affected area would be less than (<) 10 acres. Some large trees could be knocked over and understory vegetation could be covered or destroyed by debris. This is expected to occur only along the prominent cliff outcrops along the points between side drainages.

Alternative 3 (Proposed Action with Modifications)

Since subsidence of the canyon slope would not be approved, only the impacts discussed above under Alternative 2 for construction of the surface facilities are expected to occur.

G. Wildlife

Alternative 1 (No Action)

The proposed actions would not take place and the impacts discussed for the action alternatives below would not occur.

Alternative 2 (Proposed Action)

Activities associated with construction of the facilities pad and construction/reconstruction of the access roads could displace wildlife species into adjacent areas. This activity would be short-term. If species avoid a 1/2 mile area, the short-term habitat loss could be 1.5 square miles. Once construction is completed, there could be a long-term loss of habitat associated with the disturbed area (4.3 acres) due to vegetation removal, increased traffic (operations), and fan noise. Fan noise could continue to displace some species for the life of the mining operation. If a 1/2 mile area is avoided, the area would be less than 1 square mile. Most species, including big game species and birds would become accustomed to the noise and activity and slowly move back into the area. There would be a decrease in use by deer and elk for winter foraging, thermal cover, and security. Foraging, nesting, and cover use could decrease by other species. This impact would be consistent with Forest Plan direction because the activity would not result in a loss of crucial habitat needed to maintain viable populations or meet population goals.

Subsidence of the escarpment on the south slope of Rilda Canyon could cause failures of the Castlegate outcrop along the prominent points between small side drainages (less than 10 acres). This is not likely to alter habitat to any significant degree. Golden eagle Nest 296A could be at risk, however, the BLM has determined that there is negligible potential (less than 10%) for the outcrop to fail at the nest location because only first mining that is not expected to cause subsidence is planned under the nest. PacifiCorp would be required to obtain a permit to take the nest from the U.S. Fish and Wildlife Service. Mitigations would include taking appropriate measures to assure that the nest does not become active during the period that subsidence could take place in the area. There would be a negligible potential for impact to eagles. Raptor nesting habitat could be decreased until the escarpment areas stabilize.

There are no known threatened or endangered species in the area. The Northern Goshawk, Spotted bat, and Northern Three-toed woodpecker (and their habitat) are the most likely Sensitive species to exist within and adjacent to the project area. They were not found in Rilda

Canyon during the surveys conducted in June and July of 1994. Impacts to habitat are expected to be minimal. A copy of the Biological Evaluation is contained in the project file.

Loss of water due to mining could decrease the quality of riparian habitat. The potential for this to occur is expected to be low because the potential for decreasing water flow is low and remaining flows should be sufficient to maintain this habitat and provide adequate watering sources.

The short-term potential increase in sediment in Rilda Creek during construction could decrease the quality of habitat for aquatic invertebrate species in Rilda Creek and decrease populations. This could decrease habitat and food availability for trout in Huntington Creek and other species dependent on macroinvertebrates.

Alternative 3 (Proposed Action with Modifications)

Since subsidence of the canyon escarpment would not be approved under this alternative, only the impacts discussed under Alternative 2 above related to construction and operation of surface facilities would occur. The canyon escarpments would not be subsided and golden eagle Nest 296A would not be at risk.

H. Visual Quality

Alternative 1 (No Action)

The impacts discussed below for the action alternatives would not occur. Reconstruction of the Rilda Canyon County road from the intersection with the Fairview-Huntington Highway (State Hwy. 31) and replacement of the bridge will temporarily decrease visual quality consistent with visual quality objectives for the short-term (1994 summer season). The activity is visible from Huntington Canyon and State Hwy. 31 and from the Rilda Canyon County Road.

Alternative 2 (Proposed Action)

The breakout facility would be located in a densely vegetated area which contains an evergreen screen that in concert with existing topography appears adequate enough to provide camouflage for long views year-round. The new access road would require cutting into the toe of the north slope of the canyon at various points and cursory observation indicates that revegetation of these cuts may prove unsuccessful.

The road to be reconstructed on lands managed by the Forest Service in Rilda Canyon would not be visible from State Highway 31 which has been designated as a Scenic Byway. The section of powerline to be installed parallel to this reconstructed road on the National Forest would also not be visible from Highway 31. However, the powerline would be readily seen from highway 31 as it leaves Rilda canyon and passes through adjacent BLM and private lands. At this location the

powerline crosses a ridge south of the Rilda Creek/Huntington Creek confluence and would be highly visible. This would be a new visual intrusion on the landscape. The powerline would then merge with the existing powerline in Huntington Canyon and parallel it. Since there is already a powerline along this corridor, the decrease in visual quality caused by installing a parallel line would be minimal. The visibility would be increased but the visual intrusion of the existing powerline already exists.

Escarpment failures could visually impact National Forest lands on or near the walls of the canyon. The new or subsequently larger talus slopes associated with these failures would appear to be natural but can be expected to be visible from within Rilda Canyon itself, from higher elevations in other adjacent drainages, and possibly from portions of State Highway 31.

The project would be consistent with visual quality objectives.

Alternative 3 (Proposed Action with Modifications)

Since subsidence of the canyon escarpment would not be approved, only the impacts associated with construction of the surface facilities discussed above under Alternative 2 are expected to occur.

I. Recreation

Alternative 1 (No Action)

Under this alternative there would be no impacts to recreation in the area other than those expected from reconstruction of the Rilda Canyon Road from the intersection with State Hwy. 31 to the NEWUA springs. This would improve recreation access to the springs but not beyond. A negligible increase in recreation use in the canyon could occur due to the increased accessibility for passenger car traffic.

Alternative 2 (Proposed Action)

In addition to reconstruction of the road from the intersection with State Hwy. 31, Emery County would improve the Rilda Canyon Road from the springs to the forks and construct a turnaround area at the forks. This would improve access to the trails in the Left and Right Forks of Rilda Canyon and provide a parking area suitable for parking and turning large vehicles such as RVs. The improved access could increase motorized sight-seeing in the canyon during the summer season for two to three years until people become familiar with the road and facilities in the canyon.

The change in visual quality in the canyon, noise from the exhaust fan, and the musty mine odor that may be present during certain weather conditions could detract from the recreation experience in the canyon, depending on the sensitivity of individuals toward mining activities and the type of recreation experience sought after.

It is expected that hunting in the upper reaches of Rilda Canyon could decrease due to the perception by hunters that fan noise would decrease use of the area by big game species. This could be offset somewhat by the improvement of access to the area. Other recreational use of the trails, such as hiking and horseback riding, would probably slightly decrease or remain the same.

The decrease in visual quality in Huntington Canyon due to construction of the powerline is not expected to affect recreation because there is already one powerline along the proposed alignment. The presence of the powerline in Rilda Canyon would probably not affect use of the canyon by hunters.

Overall, recreation use in the canyon would probably decrease by a negligible amount in the long-term.

Failures of the Castlegate Sandstone outcrop on the south slope of Rilda Canyon is not expected to affect recreation because the failures would appear to be natural considering that this type of failure is common throughout the cliffs in Huntington Canyon. It is not likely that rocks would reach the road in the canyon bottom considering the distance, slope, and tree buffer. Monitoring would be done by the operator to assess the potential safety hazard. If the hazard becomes a concern appropriate measures would be taken to warn the public and control use in the areas where the hazard exists.

Alternative 3 (Proposed Action with Modifications)

The impacts would be the same as discussed under Alternative 2 resulting in some decrease in recreation use in Rilda Canyon. However, there would be no subsidence of the canyon escarpment and related safety concerns.

J. Socioeconomics

Alternative 1 (No Action)

Under this alternative, the surface facilities and the mining plan as proposed would not be approved. Approximately 10.4 million tons of recoverable coal would not be mined from the longwall panels that are under the escarpments. No other mining methods are feasible for these areas as some sort of non-subsidence mining would require total reinvestment by PacifiCorp for an extra continuous mining machine and support equipment to produce enough coal to supply the Huntington Power Plant. This would force the company to possibly mine Federal coal at a loss contrary to the Mineral Leasing Act of 1920, as amended. Consequently, these reserves could be lost. At current coal prices, this represents an estimated loss of the value of the coal of \$260 million to PacifiCorp and a loss of \$20 million in Federal coal royalties of which half would not be returned to the State of Utah. This loss would prevent increasing the mine life by 4 years. This would equate to 300 jobs for 4 years or roughly \$42 million in direct wages and another \$20 million in indirect wages.

PacifiCorp would need to begin developing longwall panels in other areas of the mine. The current longwall panel could be mined-out long before new panels are developed in other mine areas and longwall production could cease until new panels are developed. Since roughly 3/4 of the mine's production capacity comes from the longwall section, PacifiCorp might be forced to obtain coal reserves from alternate supplies. In addition, without the proposed ventilation fan and portals in Rilda Canyon, much of the northern and western reserves could not be mined at rates to meet demand and still meet minimum ventilation requirements. This could jeopardize the reserves for an estimated 20 years of mine life. As the mine currently has about 300 employees, employment could decrease as the mine closes. This could have a multiplier effect on the economies of Carbon and Emery County as many of the service and support industries in these counties could have to curtail business.

Alternative 2 (Proposed Action)

Under this alternative, PacifiCorp would be allowed to continue developing and mining longwall panels north towards Rilda Canyon. The ventilation fan and portals would be constructed and additional air requirements for future mining areas would be met. With additional air from the Rilda Canyon ventilation fan and portals, PacifiCorp's future reserves to the west and north can be accessed and mined and the mine life would extend to the year 2015. Approximately 10.4 million tons of coal could be recovered under the escarpments on the south side of Rilda Canyon. Employment and associated socioeconomic benefits could continue.

Alternative 3 (Proposed Action with Modifications)

Under this alternative, longwall mining under the escarpments would not be allowed but the ventilation fan and intake portals would be allowed in Rilda Canyon. Approximately 10.4 million tons of recoverable coal under the escarpments could be lost to mining. This could result in a loss of \$20 million in Federal royalty. The opportunity to extend the mine life by 4 years and employment and associated socioeconomic benefits could be reduced. The instillation of the fan would allow access and future mining of PacifiCorp's leased reserves to the west and north.

K. Short-term Use of Man's Environment vs. Long-term Productivity

Alternative 1 (No Action)

There would be no change from the current situation.

Alternative 2 (Proposed Action)

Mining of coal as proposed would extend the life of the Deer Creek Mine by approximately 20 years and provide 10.4 million tons of coal for the production of electricity. This would be a one-time short-term benefit since coal is a nonrenewable resource.

The long-term productivity of resources could be affected but not to a significant degree. Vegetation, wildlife habitat, and visual quality related to construction and operation of the surface facilities would be restored once reclamation is accomplished and determined to be successful. There could be some decrease in the flow of the NEWUA springs Rilda Creek if subsidence causes diversion of ground water. This could decrease the productivity of riparian vegetation and macroinvertebrate populations in Rilda Creek. Construction of the water treatment facility by PacifiCorp would replace any water loss to the NEWUA culinary springs and could result in an overall increase in the availability of the culinary water supply. The condition and diversity of riparian vegetation in the perennial section of Rilda Creek, at and below the springs, could be enhanced as a mitigation intended to offset the potential loss of riparian vegetation from construction of the facilities.

Alternative 3 (Proposal with Modifications)

The affects would be the same as discussed under Alternative 2 above, except that the potential for affecting the springs and flow in Rilda Canyon would be reduced by not allowing subsidence of the canyon slope (escarpment).

L. Irreversible and Irretrievable Commitments of Resources

Alternative 1 (No Action)

The minable coal reserves not mined under this alternative would be irreversibly lost considering present mining technology. It would be bypassed. The associated loss of energy and economic benefits would be irreversible.

Alternative 2 (Proposed Action)

The loss of vegetation and associated wildlife habitat and impacts to visual quality from the surface facilities would be irretrievable but not irreversible. Once operations are completed (approximately 20 years), the disturbed area would be recontoured and reclaimed. It would take approximately 3-5 years to re-establish vegetation on the disturbed sites and 5-10 years for tree species to become established and vegetation to blend in with the surrounding areas.

Damage to vegetation from escarpment failure would be irretrievable and would take longer to naturally recover because of the steep slopes. Efforts to reclaim these sites are not planned because of the steep slopes, small extent of area expected disrupted, distance from the creek, and rocky nature of the slopes.

Any loss of flow in the springs, alluvial aquifer, and in Rilda Creek due to mining in the escarpment areas and along the ridge tops would be irretrievable and potentially irreversible. Various methods could be used to replace some flow and expanding clays are expected to seal

cracks and replace some flow paths but the change to the ground water system would probably be permanent.

Coal is not a renewable resource. Mining and burning of the coal to produce electricity would be an irreversible commitment of the coal itself and other energy resources used in the mining process.

Alternative 3 (Proposed Action with Modifications)

Irretrievable and irreversible impacts would be the same as discussed above under Alternative 2 except that there would be no irretrievable impacts to vegetation and wildlife habitat on the escarpment and the potential for irretrievable and irreversible impacts to the NEWUA springs and flow in Rilda Creek would be reduced from the already low potential under Alternative 2.

M. Cumulative Impacts

Alternative 1 (No Action)

Under this alternative, there would be no changes to the current situation.

The Rilda Canyon area and ecosystem has been continuously altered by natural flooding, erosion, glacial activity, fires, insect infestations, and other natural processes prior to encroachment by man. There is some evidence of long-term habitation by Formative (Fremont) Stage (AD 400 to AD 1300) peoples. Temporary occupation on a seasonal basis is suspected by Archaic and later populations. European settlement resulted in hunting/trapping of game, timber harvest, livestock grazing, and coal mining. Livestock grazing on the Wasatch Plateau was extensive in the late 1800s resulting in extensive watershed damage and erosion. Management of grazing by the Forest Service since 1906 has resulted in significant improvement of resource conditions. Rilda Canyon has not been as severely altered by grazing as many other areas on the plateau. Vegetation density is high and the range conditions are generally good.

Rilda Canyon is included within the Gentry Canyon (forks of Rilda Creek to Huntington Creek) and the Trail Mountain (Left Fork of Rilda Creek) Cattle and Horse Grazing Allotments). These allotments are grazed in early spring. Grazing has resulted in the decrease in native understory species and the introduction of non-native species and potentially the overall reduction of understory plant diversity. The present level of grazing will continue with some potential decreases in numbers in the future.

Coal prospecting and some limited mining probably occurred in Rilda Canyon in the late 1800s. Four coal mines have operated on and off between 1936 and 1969. The mines resulted in improvement of any prior existing access in the canyon and changes in the topography related to access to the portals and development of portals. Trees were harvested for mine support timbers. The old coal storage areas,

portals, and portal access roads were reclaimed in 1990 by the Utah Division of Oil, Gas and Mining under the abandoned coal mine reclamation program. Development of facilities and the human activity in the canyon undoubtedly caused increased erosion and sediment production, disturbance of wildlife, and decrease in water quality. Reclamation and revegetation have been monitored and have proven to be very successful. The springs later developed by NEWUA were probably developed to provide water for mining operations. The reclaimed mines were not producing water.

NEWUA developed the springs at the Side Canyon drainage in Rilda Canyon in 1972. The development includes the water collection systems and a 6 inch pipeline buried under the road. Water is diverted from the creek to serve approximately 421 families in northern Emery County with culinary water. This diversion decreases the surface flow in Rilda Creek by as much as 400 gpm, but flow continues to be perennial below the springs in amounts sufficient to sustain the stream integrity, riparian vegetation, and the overall health of the ecosystem.

The Rilda Canyon road (jurisdiction of Emery County from Hwy. 31 to the NEWUA springs under R.S. 2477) is a native surface road which is in poor condition resulting in severe erosion of the road surface and associated ditch during spring runoff and rainstorms. Sediment contributions to Rilda Creek and Huntington Creek is high during these periods. Reconstruction of the road by Emery County to a 20 foot travel width with designed drainage will decrease erosion and sediment production in the long-term, once construction is completed. The inside road ditch and culvert outlets will be armored with rock riprap to control water velocities and erosion. Existing ground and surface water quality and flow is described in Chapter 3, Items D and E.

Approximately 2,000 acres of vegetation burned on East Mountain in the Fall of 1993. The fire included the upper portion of the Right Fork of Rilda Canyon but did not encroach into the Left Fork. The fire burned mostly understory vegetation and conifer stands. The estimated burn within the fire perimeter is 50-60%. Water monitoring in Rilda Creek by PacifiCorp has shown that there is no measurable difference in water quality in Rilda Creek with the possible exception of sediment production during runoff from snowmelt and rainstorms. Ash from the burned vegetation has been observed in the creek during rainstorm runoff. A significant recovery of understory vegetation and aspen has been observed in the 1994 spring/summer season. Near complete recovery of understory vegetation is expected during the 1995 spring/summer season. Sediment increases have been negligible since the fire and are not expected to continue beyond the 1994.

A short-term increase in motorized sight seeing in Rilda Canyon is expected due to the road improvement.

No other management activities are planned for the canyon.

Alternative 2 (Proposed Action)

The anticipated impacts to the existing environment (referred to as the affected environment in Chapter 3) were described throughout Chapter 4 by resource category. They would be cumulative, adding to changes that man's activities have already caused in Rilda Canyon.

Surface facilities are expected to cause some but an insignificant amount of vegetation removal and loss of wildlife habitat. The loss of habitat would contribute to cumulative losses but wildlife species have sufficient areas available to maintain populations.

It is unlikely that the cumulative impacts would cause significant impacts to flow, stream channel morphology, riparian vegetation, and wildlife species in the canyon, even though some changes could occur. Any potential loss of culinary water would be offset by development of the reservoir, deep water wells, and the water treatment facility near Deer Creek. Exclusion of livestock use in Rilda Canyon as a mitigation, should result in improved diversity and health of the riparian ecosystem from the springs downstream to private lands at the canyon mouth. Short-term increased sediment levels from road reconstruction and construction of the facilities should be offset by a long-term decrease in sediment production. Sediment production from the existing low standard road has been high.

Water intercepted during mining could enter the mine workings and be discharged into Deer Creek or could continue to flow down-dip to the south in the ground water system. It is not likely that water would be depleted from the Huntington Canyon watershed or the Colorado River system.

A decrease in the use of the trails in the Left and Right Forks is expected due to the fan noise, decrease in visual quality from the surface facilities pad, and increased human presence from mining related activities. Hunting in the canyon is also expected to decrease.

No additional disturbance for surface facilities is reasonably foreseeable at this time. PacifiCorp evaluated the potential for loading and hauling coal at the proposed breakouts for trucking to the Huntington Power Plant. This scenario would have involved parking areas for the miners, a bathhouse, coal storage and loading facilities, equipment storage, and paving the Rilda Canyon Road for hauling. This scenario was replaced with the current proposal due to Forest Service concerns and available mineable reserves. It was determined that the proposed facilities would provide for the reasonably foreseeable needs of the operator for mining.

Alternative 3 (Proposed Action with Modifications)

The impacts would be the same as discussed under Alternative 2 except that there would be no mining induced failures of the canyon slope/escarpment and associated loss of vegetation. The potential

for mining to cause a decrease in flow at the NEWUA springs and in Rilda Creek would be decreased.

CHAPTER 5
LIST OF PREPARERS

The following is a list of interdisciplinary team members who directly participated in conducting the environmental analysis and preparing the environmental assessment. The title resource area represented and role on the team is indicated for each person. Other employees of the Forest Service, Bureau of Land Management, and Office of Surface Mining provided comments.

<u>Name</u>	<u>Analysis Skills/Specialty</u>	<u>Role</u>
Carter Reed	Geology/Minerals	Team Leader
Brent Barney	Engineering/Transportation	Core Team Member
Dennis Kelly	Surface Water Hydrology	Core Team Member
Steve Romero	Wildlife	Core Team Member
Paul Burns	Wildlife (Aquatic)	Extended Team Member
Kevin Draper	Visual Quality/Recreation	Core Team Member
Bob Thompson	Vegetation/Reclamation	Extended Team Member
Steve Falk	Mining Engineer/BLM Rep.	Core Team Member
Ken Wyatt	Ground Water Hydrology	Core Team Member
Floyd McMullen	OSMRE Rep.	Extended Team Member

CHAPTER 6
REFERENCES

The following is a list of tiering and reference documents:

Danielson, Terence W., et. al., 1981, Hydrology of the Coal-Resource Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Central Utah, U.S.G.S. Water-Resources Investigations Open-File Report 81-539.

Lines, G.C., 1985, The Ground-Water System and Possible Effects of Underground Coal Mining in the Trail Mountain Area, Central Utah, U.S.G.S. Water-Supply Paper 2259

PacifiCorp, 1993, Deer Creek Coal Mine Permit Application, Deer Creek (ACT/015/018)/Cottonwood (ACT/015/019), Des-Bee-Dove (ACT/015/017), Hydrologic Section, Volume 9, Revised March 41, 1993.

USDA, Forest Service, 1986, Final Environmental Impact Statement and Land and Resource Management Plan, Manti-La Sal National Forest, Price, Utah (Forest Plan).

USDI, Bureau of Land Management, 1988, Final Environmental Impact Statement, San Rafael Resource Management Plan, 1988 (RMP).

USDA, Forest Service, 1986, Environmental Assessment for Readjustment of Consolidated Federal Coal Lease SL-050862/U-24069/U-24070, Price Ranger District, Manti-La Sal National Forest, Emery County, Utah, December, 1986

USDA, Forest Service, 1976, Environmental Analysis Report/Part 23 Technical Examination, Peabody Coal Company, Federal Leases U-06039, SL-051221, and U-014275, Lease Readjustment, October 4, 1976.

USDA, Forest Service, 1992, Decision Notice and Finding of No Significant Impact for the Readjustment of Federal Coal Lease U-06039, Price Ranger District, Manti-La Sal National Forest, Emery County, Utah, May 15, 1992 (See Attachment B, Environmental Analysis Summary Matrix).

USDA, Forest Service, 1990, Environmental Assessment for the Readjustment of Federal Coal Lease U-7653, Price Ranger District, Manti-La Sal National Forest, Emery County, Utah, January, 1990.

USDA, Forest Service, 1980, Environmental Assessment, 40 CFR 1500, 43 CFR 3521, 1-4, Proposed Coal Lease Tract, Section 32, T. 16 S., R. 7 E., SLM, Emery County, Utah, October 8, 1980 (This lease was officially assigned No. U-47977 when it was leased in 1982).

USDA, Forest Service, 1989, Environmental Assessment for the Readjustment of Federal Coal Lease U-024319, Price Ranger District, Manti-La Sal National Forest, Emery County, Utah, July, 1989.

APPENDICES

- APPENDIX 1 - Public Scoping Letter with Mailing List
- APPENDIX 2 - Public Notices
- APPENDIX 3 - Mitigations
- APPENDIX 4 - Role of Office of Surface Mining Reclamation and Enforcement in the Regulation of Coal Mining

Appendix 1

United States
Department of
Agriculture

Forest
Service

Manti-La Sal
National Forest

Price Ranger District
599 West Price River Dr.
Price, Utah 84501

Reply to: 2820

Date: May 5, 1994

m01n

m02n

PacifiCorp has submitted a mine plan amendment to the Utah Division of Oil, Gas and Mining proposing to construct a breakout on the south slope of the Left Fork of Rilda Canyon and to mine and subside the south slope of Rilda Canyon and the upper reaches of the Left Fork drainage channel on their existing coal leases. The breakout would provide air ventilation for the Deer Creek Mine. The 1.2 acre facilities pad would contain three portals, a ventilation fan on the easternmost portal, an electric substation, water storage tank, and pumphouse. The existing Rilda Canyon road (Forest Development Road 50246) would be improved to a 14 foot gravelled travel width from the intersection with the county road at the North Emery Water Users Association springs to the forks (0.5 mile). A turnaround area would be constructed at the forks. A new (gravelled, restricted access) road would be constructed from the forks to the facilities pad, a distance of 1,350 feet (1.3 acres). A new 25KV overhead power line would be constructed along the Rilda Canyon road to the substation on the facilities pad.

As the surface management agency for the majority of the lands involved, the Forest Service will take the lead on conducting the environmental analysis of the proposal under the National Environmental Policy Act of 1969 (NEPA). The Bureau of Land Management, and Office of Surface Mining Reclamation and Enforcement will cooperate in conducting the analysis.

You are invited to provide comments and identify issues. Please send any comments to Charlie Jankiewicz, District Ranger, Price Ranger District, Manti-La Sal National Forest, 599 West Price River Drive, Price, Utah 84501. To obtain additional information or comment on the proposed action by telephone, contact Carter Reed or Jeff DeFreest at 801-637-2817. Comments must be received by the close of business on June 3, 1994.

Sincerely,

/s/ Charlie J. Jankiewicz

CHARLIE JANKIEWICZ
District Ranger

J.Defreest:dm

m01nKen Phippen
Division of Wildlife Resources
455 W. Railroad Avenue
Price, UT 84501
m02nDear Ken:

m01nEmery County Commissioners
c/o Dixie Thompson
P.O. Box 629
Castle Dale, Utah 84513
m02nDear Dixie:

m01nDick Carter
Utah Wilderness Association
455 E. 400 S.
Salt Lake City, Utah 84111
m02nDear Dick:

m01nHuntington Cleveland Irrigation
c/o J. Craig Smith
P.O. Box 11808
Salt Lake City, Utah 84147
m02nDear Craig:

m01nEmery County Water Conservancy District
c/o Jay Mark Humphrey
P.O. Box 998
Castle Dale, Utah 84513
m02nDear Jay:

m01nPacifiCorp
c/o Interwest Mining Co.
ATTN: Property Administration
One Utah Center, Suite 2000
201 South Main Street
Salt Lake City, Utah 84140
m02nDear Sir:

m01nHuntington Cleveland Irrigation
c/o Varden Willson
P.O. Box 327
Huntington, Utah 84528
m02nDear Varden:

m01nNorth Emery Water Users Association
c/o Jack Stoyanoff
P.O. Box 160
Elmo, Utah 84521
m02nDear Jack:

m01nCrandall Ridge S&G Allotment
c/o John Larsen
1665 E. 1280 N. #84
Mt. Pleasant, Utah 84647
m02nDear John:

m01nLee Lemmon
Huntington Cattlemen's Association
P.O. Box 193
Huntington, UT 84528
m02nDear Lee:

Appendix 2

For publication in the Sun Advocate on Thursday, May 5 and
the Emery County Progress on Tuesday, May 10.
For further information contact: Carter Reed at 637-2817.

LEGAL NOTICE

USDA Forest Service
Intermountain Region
Manti-La Sal National Forest
Price Ranger District
Emery County, Utah

The Price Ranger District of the Manti-La Sal National Forest is evaluating a proposal by PacifiCorp to construct a breakout on the south slope of the Left Fork of Rilda Canyon and to mine and subside the south slope of Rilda Canyon and the drainage channel in the upper reaches of the left fork. The breakout would provide air ventilation for the Deer Creek Mine. The 1.2 acre facilities pad would contain 3 portals, a ventilation fan on the easternmost portal, a substation, water storage tank, and pumphouse. The existing Rilda Canyon road (Forest Development Road 50246) would be improved to a 14 foot gravelled travel width from the intersection with the county road at the North Emery Water Users Association springs to the forks (0.5 mile). A turnaround area would be constructed at the forks. A new low standard gravelled restricted access road would be constructed from the forks to the facilities pad, a distance of 1,350 feet (1.3 acres). A new 25KV overhead power line would be constructed along the Rilda Canyon road to the substation on the facilities pad.

The Forest Service, Bureau of Land Management, and Office of Surface Mining Reclamation and Enforcement will cooperate in conducting an environmental analysis for the proposal.

The public is invited to provide comments and identify issues. To obtain additional information or comment on the proposed action, contact Carter Reed or Jeff DeFreest at the Manti-La Sal National Forest Supervisor's Office, 599 West Price River Drive, Price, Utah 84501, (Phone 801-637-2817). Comments must be received by the close of business on June 3, 1994.

APPENDIX 3

MITIGATIONS FOR ALTERNATIVES 2 AND 3

Mitigations that will be required for operations if one of the two action alternatives (Alternatives 2 and 3) is selected are discussed in this appendix. The mitigations common to both alternatives are discussed as well as those specific to Alternative 2 are discussed under separate headings. Operations are subject to adherence to the stipulations attached to the individual coal leases affected by operations and to provisions of the approved mine plan and mine permit.

A. Mitigations Common to Alternatives 2 and 3

1. The operator must construct a fence and cattleguard at the mouth of Rilda Creek to exclude livestock use in the canyon. Maintenance of this facility during the life of operations would be the operator's responsibility. This would prevent damage to the riparian vegetation and enhance the area for wildlife to offset the loss of riparian vegetation from facilities pad and road construction. The fence and cattleguard designs and specific location are subject to Forest Service review and approval.
2. The facilities pad must be fenced to provide for public safety and prevent access by livestock and big game species.
3. Facilities must be painted with a color that blends naturally with the surrounding environment. The color is subject to approval by the Forest Service.

B. Mitigations Specific to Alternative 2

1. In the event that rocks or other debris from the escarpment reach Rilda Creek and cause blockage or alteration of the natural flows, the operator will be required to remove the materials causing the blockage, take necessary measures to prevent sediment production, replace riparian vegetation through reclamation of other means, and replace the the natural flow patterns. The method of conducting these required activities are subject to approval of the regulatory authority with consent from the Forest Service.
2. Any damage to fences, roads, spring developments, etc. caused by escarpment failures or other operations must be repaired or replaced as soon as possible. Methods for repair or replacement of such facilities are subject to approval of the regulatory authority with consent from and Forest Service.
3. The operator must take necessary measures to prevent raptors from building and occupying nests in the escarpment area during periods that they would be at risk from subsidence. Golden eagle nest 296A must be protected from subsidence unless the operator obtains a take permit from the U.S. Fish and Wildlife Service.

4. The operator must monitor subsidence and escarpment areas to determine the extent of escarpment failures that occur and to determine when they stabilize. The operator is responsible to ensure public safety in the areas where escarpment failures are likely to occur until it is determined that subsidence is substantially complete and the escarpments have stabilized. Methods of providing for public safety and for monitoring escarpment failures (including the frequency of monitoring) are subject to approval of the regulatory authority with consent from the Forest Service.

5. Should escarpment failures occur to an extent beyond that predicted and cause functional impairment of surface resources (impacts that are not consistent with management prescriptions in the Forest Plan), additional operations that could cause escarpment failures must be suspended pending evaluation by the regulatory authority in consultation with the Forest Service.

Appendix 4 - Role of Office of Surface Mining Reclamation and Enforcement
in the Regulation of Coal Mining

The Surface Mining Control and Reclamation Act of 1977 (SMCRA) gives the Office of Surface Mining Reclamation and Enforcement (OSM) primary responsibility to administer programs that regulate surface coal mining operations and the surface effects of underground coal mining operations. In January 1981, pursuant to Section 503 of SMCRA, the Utah Division of Oil, Gas, and Mining (DOG M) developed, and the Secretary of the Interior approved, a permanent program authorizing Utah DOGM to regulate surface coal mining operations and surface effects of underground mining on non-Federal lands within the State of Utah. In March 1987, pursuant to Section 523 (c) of SMCRA, Utah DOGM entered into a cooperative agreement with the Secretary of the Interior authorizing Utah DOGM to regulate surface coal mining operations and surface effects of underground mining on Federal lands within the State.

Pursuant to the cooperative agreement, Federal coal lease holders in Utah must submit permit application packages (PAP's) to OSM and Utah DOGM for proposed mining and reclamation operations on Federal lands in the State. Utah DOGM reviews the PAP to ensure that the permit application complies with the permitting requirements and that the coal mining operation will meet the performance standards of the approved permanent program. If it does comply, Utah DOGM issues the applicant a permit to conduct coal mining operations. OSM, the Bureau of Land Management (BLM), the Forest Service (FS), and other Federal agencies review the PAP to ensure that it complies with the terms of the coal lease, the Mineral Leasing Act of 1920, the National Environmental Policy Act of 1969, and other Federal laws and their attendant regulations. OSM recommends approval, approval with conditions, or disapproval of the mining plan to the Assistant Secretary--Land and Minerals Management. Before the mining plan can be approved, BLM and the surface-managing agency (in this case FS) must concur with this recommendation.

Utah DOGM enforces the performance standards and permit requirements during the mine's operation and has primary authority in environmental emergencies. OSM retains oversight responsibility for this enforcement. BLM and FS have authority in those emergency situations where Utah DOGM or OSM inspectors cannot act before significant environmental harm or damage occurs.

LETTERS OF CONCURRENCE

3482
SL-070645
U-C2292
(U-065)

Moab District
P.O. Box 970
Moab, Utah 84532

FEB 28 1991

Pamela Grubaugh-Littig, Permit Supervisor
State of Utah
Division of Oil, Gas and Mining
355 West North Temple Street
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Ms. Grubaugh-Littig:

On February 21, 1990, the Bureau of Land Management (BLM) received PacifiCorp's proposed Rilda Canyon Lease Tract addition for the Deer Creek Mine Permit Application Package (PAP). The BLM was asked to review the resource recovery and protection plan (R2P2) and submit our findings which are discussed below.

PacifiCorp plans to enlarge the Deer Creek Mine Permit Area (Act/015/018) by adding an adjacent tract to the north. The tract includes one State of Utah coal lease (ML-22509), three Federal coal leases (U-7653, U-47977, and SL-050862) and the southern portion of Federal coal lease U-06039.

The R2P2 calls for the development of main entries in a north-northwest direction beyond the Roan's Canyon Fault. Longwall panels are projected on both sides of these main entries. A number of longwall panels located along the south side of Rilda Canyon will undermine portions of the canyon escarpments (see enclosed highlighted map). This has prompted an in-depth review of potential escarpment failure.

The Manti-LaSal National Forest (FS) has asked BLM to evaluate the R2P2 and determine if the mining plan provides adequate protection of surface resources in accordance with the Federal lease terms and conditions. The BLM is currently working on a response to the FS regarding our analysis of the escarpment issue. Final approval of mining zones that may affect sensitive escarpment areas is contingent on the completion of the technical studies currently underway. Because the mine plan provides adequate flexibility for any necessary future adjustments in these areas, development as proposed for the remainder of the R2P2 is recommended for approval.

We have determined that the R2P2 as submitted is complete and technically adequate. The R2P2 is also in compliance with the Mineral Leasing Act, as amended, the regulatory provisions of 43 CFR 3480, Federal lease terms and conditions, and will achieve maximum economic recovery (MER) of the Federal coal. Therefore, we recommend partial approval of the R2P2 for this permit action.

Sincerely yours,

Mary Johnson
for

Assistant District Manager
Mineral Resources

Enclosure:
Mine Projection Map

cc: SD, Utah (U-921), w/enclosure
DM, Moab (U-065), w/enclosure
Office of Surface Mining, Denver, w/enclosure
PacifiCorp, SLC, Utah, w/enclosure
Manti-LaSai NF, Price, Utah, w/enclosure

SFalk:ks:2/15/91
Wang 2015D



United States Department of the Interior
FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115

In Reply Refer To
(ES)

November 4, 1994

Division of Oil, Gas, and Mining
Utah Department of Natural Resources
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

Re: **Rilda Canyon Lease Extension, PacifiCorp, Deer Creek Mine, ACT/015/018-94A,
Folder #2, Emery County, Utah**

This is in response to your letter concerning the above lease. The Fish and Wildlife Service has reviewed the material provided and believes no significant impacts to wildlife resources would be expected.

We appreciate the opportunity to comment on this project.

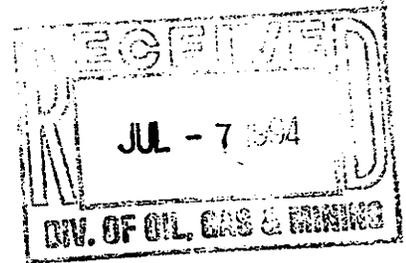
Sincerely,

Robert D. Williams
Assistant Field Supervisor



United States Department of the Interior
FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115



In Reply Refer To

July 6, 1994

Daron R. Haddock
Division of Oil, Gas, and Mining
Utah Department of Natural Resources
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

Re: **Rilda Canyon Lease Extension, PacifiCorp, Deer Creek Mine, ACT/015/018-94A,
Folder #2, Emery County, Utah**

Dear Mr. Haddock:

*ACT/015/018-94A #3
Copy Dam*

This is in response to your letter of June 27, 1994 concerning the above lease. The Fish and Wildlife Service has reviewed the material provided and believes no significant impacts to wildlife resources would be expected. This is based on the following facts:

- 1) no surface waters exist in the area above the Third and Fourth East panels and no significant groundwater sources were encountered during entry development mining in these areas;
- 2) no goshawks or three-toed woodpeckers were found above the proposed panel extraction and the nearest golden eagle and red-tailed hawk nests are located beyond the limits of potential subsidence impacts; and
- 3) no threatened, endangered or sensitive plant or animal species are known to inhabit the area.

We appreciate the opportunity to comment on this project.

Sincerely,

for *Ray R. Williams*
Robert D. Williams

Assistant Field Supervisor



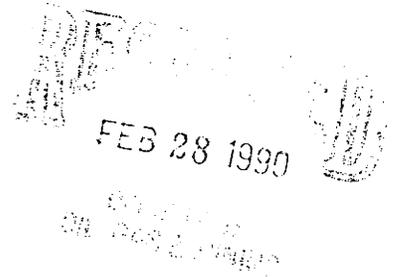
State of Utah

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

Norman H. Bangertter
Governor
Max J. Evans
Director

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

February 22, 1990



Ms. Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

RE: Rilda Canyon Lease Tract Addition, Permit Application Package, Utah Power and Light Company, Deer Creek Mine, ACT/015/018(90-1), Folder #2, Emery County, Utah

In Reply Please Refer to Case No. I794

3 Copy PAM

Dear Ms. Grubaugh-Littig:

The Utah State Historic Preservation Office received the above referenced report on February 16, 1990. After review of the additional information in the mine plan, our office believes that no additional comments concerning cultural resources are needed. Thank you for the opportunity to review the mine plan.

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,

James L. Dykman
Regulation Assistance Coordinator

JLD:I794/8392V OR



State of Utah

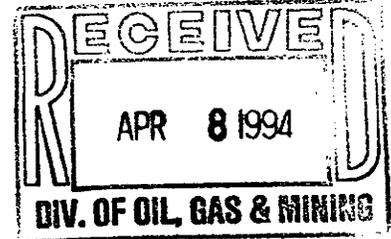
Department of Community & Economic Development
Division of State History
Utah State Historical Society



Michael O. Leavitt
Governor
Max J. Evans
Director

300 Rio Grande
Salt Lake City, Utah 84101-1182
(801) 533-3500
FAX: (801) 533-3503

April 6, 1994



Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Copy Pam

#2 RE: Rilda Canyon Lease Extension, Deer Creek Mine, Pacificorp,
ACT/015/018-94A, Folder #2, Emery County, Utah

In Reply Please Refer to Case No. 90-1579

Dear Ms. Grubaugh-Littig:

The Utah State Historic Preservation Office received information on the project referenced above on March 25, 1994. We have previously concurred with your recommendations for the project, and have no additional comment at this time. We appreciate being informed as to the progress of the project, and will be adding this information to the case file.

This information is provided on request to assist the Division of Oil, Gas and Mining in identifying historic properties, as specified in 36CFR800, for Section 106 consultation procedures. If you have questions, please contact me at (801) 533-3555.

Sincerely,

Janice Reed Campbell
for James L. Dykmann
Compliance Archaeologist

JLD:90-1579 DOGM

United States
Department of
Agriculture

Forest
Service

Manti-La Sal
National Forest

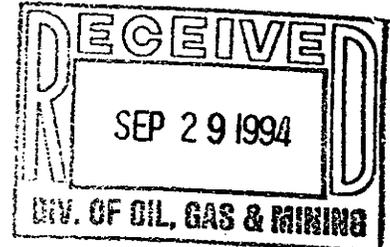
599 West Price River Dr.
Price, Utah 84501

DRAFT

Reply to: 2820

Date: September 27, 1994

Utah Coal Regulatory Program
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
Attention: Pamela Grubaugh-Littig



RE: Rilda Canyon Lease Extension and Surface Facilities, Deer Creek Mine,
PacifiCorp, ACT/015/018-94A, Folder #~~2~~₃, Emery County, Utah *Copy Pgm (all)*

Dear Ms. Littig:

We hereby consent to addition of the extension area into the permit area for the Deer Creek Mine, construction of surface facilities in Rilda Canyon, and mining under the south canyon escarpment in Rilda Canyon by PacifiCorp. Enclosed are a copy of the Environmental Assessment (EA) and Decision Notice/Finding of No Significant Impact (DN/FONSI) for PacifiCorp's proposed surface facilities and mining under the south canyon escarpment. This approval is contingent upon the mitigations attached to the DN/FONSI.

The decision to consent to addition of the extension area is effective immediately, however, the decision to consent to surface facilities and to subside the escarpment is subject to Forest Service appeal regulations 36 CFR 215 and 271. Any appeals must be filed within 45 days of the date that the Forest Service decision is published in the Sun Advocate, which was September 27, 1994. Depending on the results of the appeal process, the earliest that surface operations may begin would November 21, 1994.

If you have any questions, contact us at the Forest Supervisor's Office in Price, Utah.

Sincerely,

George A. Morris
FOR

GEORGE A. MORRIS
Forest Supervisor

Enclosures

cc:

D-3

Floyd McMullen, Office of Surface Mining
Val Payne, PacifiCorp



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
James W. Carter
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340
801-359-3940 (Fax)
801-538-5319 (TDD)

October 26, 1994

TO: File

FROM: Pamela Grubaugh-Littig, Permit Coordinator *pgl*

RE: Compliance Review for Section 510 (c) Findings, Deer Creek Mine, PacifiCorp, ACT/015/018, Folders #3 and #5, Emery County, Utah

As of the writing of this memo there is a conditional issue for the Deer Creek Mine permit. The Deer Creek Mine permit has been conditioned to reflect two outstanding enforcement actions that are under appeal by PacifiCorp:

- 1) PacifiCorp must notify the Division with 14 days of the decision on the appeal of outstanding federal violation 93-020-190-05, 1 of 1, and
- 2) PacifiCorp must notify the Division within 14 days of the decision on the appeal of outstanding cessation order 94-020-370-002, 1 of 1.

PacifiCorp does not have a demonstrated pattern of wilful violations, nor have they been subject to any bond forfeitures for any operations in the state of Utah.





United States Department of the Interior



OFFICE OF SURFACE MINING
Reclamation and Enforcement
Applicant/Violator System Office
1800 New Circle Road, NE
Lexington, KY 40505-4215

Memorandum

To: Pam Littig
Utah Regulatory Authority

From: Colene Carlson *CCA*
Lexington AVS Office

Date: October 26, 1994

Subject: Pacificorp Electric Operations

The recommendation for Pacificorp Electric Operations (118429) application ACT015043 is **CONDITIONAL ISSUE**. The recommendation is based on the outcome of the hearings on Federal CO 94-020-190-1.



United States Department of the Interior



OFFICE OF SURFACE MINING

Reclamation and Enforcement
Applicant/Violator System Office
1300 New Circle Road, NE
Lexington, KY 40505-4215

Memorandum

To: Pam Littig
Utah Regulatory Authority

From: Colene Carlson *CC*
Lexington AVS Office

Date: October 26, 1994

Subject: Pacificorp Electric Operations

The recommendation for Pacificorp Electric Operations (118429) application ACT015018 is CONDITIONAL ISSUE. The recommendation is based on the outcome of the hearings on Federal CO 94-020-190-1.

AVS Recom Maint Applicant Violator System 26-Oct-1994 11:52:16

State : UT Permit No : ACT015018	Appl No : ACT015018
Permittee : 118429(PACIFICORP ELECTRIC OPERATIONS)	Segno : 1
Applicant : 118429(PACIFICORP ELECTRIC OPERATIONS)	

SYSTEM : C (COND ISSUE)	Date : 10/26/94	Mode : VIEW
Reason : 0 AML, 0 AUD, 1 CMIS, 0 FORF, 0 STATE VIOLATION(S)		

OSMRE : C (COND ISSUE)	Date : 10/26/94	Mode : UPDATE
Reason : ON THE OUTCOME OF THE HEARING ON FEDERAL CO94-020-190-1		

FO :	Date :	Mode : VIEW
Reason :		

SRA :	Date :	Mode : VIEW
Reason :		

SAVE(F5) DELETE(F8)
 PRV_SCR(F3) QUIT(F4) CHOICES(F10)
 avsdg

TECHNICAL ANALYSIS RILDA LEASE EXTENSION

PacifiCorp
Deer Creek Mine
ACT/015/018

October 3, 1994

INTRODUCTION

This Technical Analysis discusses PacifiCorp's application to add the Rilda Lease to the current Deer Creek mining operation. The Rilda Lease consists of three complete federal leases (U-7653, U-47977, SL-050862), a part of federal lease U-06039, and a state lease (ML-22509) and comprises 2371.6 acres. Mining would be done as an extension of current underground mining operations. While PacifiCorp has plans to construct surface facilities in Rilda Canyon in the future, no surface facilities are being proposed or analyzed as part of this application. The current application calls for mining in the Rilda lease as an underground extension of existing mines.

ADMINISTRATIVE

Regulatory Reference: R645-300

The application for adding the Rilda Lease to the Deer Creek permit contains all the necessary information for processing. The application was determined to be administratively complete and a notice of administrative completeness was sent to interested agencies on June 29, 1994.

SOILS

Regulatory Reference: R645-301-200

Analysis:

A soil survey for the Rilda Lease area was completed on October 10, 1990 by Thomas H. Furst, Soils Consultant.

Findings:

Since this proposal is an underground extension of an existing operation no additional impacts to soil are anticipated.

BIOLOGY

Regulatory Reference: R645-301-300

Analysis:

Impacts to plant or animal species, as a result of the addition of the Rilda Lease, would be as a result of subsidence or interception of groundwater. Mining panels have been laid out in a manner which would prevent subsidence from impacting critical habitat such as escarpments. There are no known threatened or endangered species in the area, although bald eagles and peregrine falcon could occur on occasion. The Northern Goshawk, Spotted bat, and Northern Three-toed woodpecker are the most likely sensitive species to exist within and adjacent to the permit area. A Golden Eagle Nest (296a) is located within the proposed permit area. The nest is not considered at risk since only first mining that is not expected to cause subsidence is planned under the nest.

Subsidence of escarpments could result in blocks tumbling down the slope resulting in the loss of raptor nests or damage of some vegetation. Large rocks could block portions of Rilda Creek affecting aquatic or riparian habitat. The Applicant has designed the mine lay out to prevent subsidence to escarpments. Also mitigation for any damage resulting from subsidence has been committed to. In addition the Forest Service has provided stipulations in conjunction with their Decision Notice/Finding of No Significant Impact which provide for additional protection of raptor nests and mitigation for damage caused by escarpment failure.

Interception of ground water through mining activities could impact seeps and springs in the area resulting in decreased quality of the riparian habitat. The geologic structure indicates that recharge is most likely coming from the area north of Rilda Canyon or from alluvial water. This being the case, the potential for decreased flow is low. Remaining flows should be sufficient to maintain habitat and provide adequate watering sources.

Findings:

Since this proposal is an underground extension of an existing operation impacts would be associated with subsidence effects or effects due to interception of ground water. The applicant has provided for protection of Biological resources by designing mining methods to minimize subsidence impacts and by providing mitigation for unforeseen impacts.

LAND USE AND AIR QUALITY

Regulatory Reference: R645-301-400

Analysis:

An extensive investigation for the Rilda Lease Tract area was conducted by Archaeological-Environmental Research Corporation in August, 1990. A report and maps are provided in the application.

Three prehistoric sites were located. Of the three sites 42Em2223 has National Register quality significance. The current mining plan does not involve mining beneath it. The nearest area of longwall extraction is approximately 2800 feet from the site which will put it well beyond the area of possible subsidence related surface impacts. None of the three sites is considered susceptible to extensive damage through subsidence because of their low profile, lack of architecture, and lack of rock art.

Findings:

Since this is an underground extension of an existing operation the impacts which would effect land use or air quality would be associated with subsidence. No impacts are anticipated.

ENGINEERING

Regulatory Reference: R645-301-500

See specific section below.

CERTIFICATION

Regulatory Reference: R645-301-512

Analysis:

The maps which have been revised for the Rilda Lease Tract Extension are:

- | | |
|--|---|
| Map 1-1 - Coal Ownership Map | Map 2-6B - Hiawatha Coal Seam Overburden Isopach |
| Map 1-2 - Coal Ownership Map | Map 2-6C - Blind Canyon & Cottonwood Coal Seams
Overburden Isopach |
| Map 1-3 - Mine Permit Area with Mine Development
as of August 3, 1977 | Map 2-14 - Vegetation Map |
| Map 2-2 - Hiawatha Structure Contour | Map 2-16 - General Soil Map |
| Map 2-2A - Blind Canyon & Cottonwood Structure
Contour Map | Map 2-18A--Land Use Map |
| Map 2-4 - Isopach Map of the Hiawatha Coal Seam | Map 2-18B - Raptor Nesting Location and Habitat |
| Map 2-5 - Blind Canyon-Hiawatha Interburden
Isopach Map | Map 2-19 - Mule Deer Habitat |
| Map 2-6 - Isopach Map of the Blind Canyon and
Cottonwood Coal Seams | Map 3-6 - Life of Mine Plan/5-year Increments/Blind
Canyon Coal Seam |
| | Map 3-7--Life of Mine Plan/5-year
Increments/Hiawatha Coal Seam. |

Of the maps listed above only Maps 2-2, 2-2A, 2-4, 2-5, 2-6, 2-6B, and 2-6C require certification by a registered professional engineer or land surveyor. These maps have the required certification.

Location in Plan:

Maps 1-1, 1-2, 1-3, 2-2, 2-2A, 2-4, 2-5, 2-6, 2-6B, 2-6C, 2-14, 2-16, 2-18A, 2-18B, 2-19, 3-6, and 3-7.

Findings:

The application fulfills the requirements of this section.

COMPLIANCE WITH MSHA REGULATIONS AND MSHA APPROVALS

Regulatory Reference: R645-301-513

Analysis:

The entire Rilda Lease Tract Extension will be underground. There are, therefore, no coal processing waste dams and embankments, sedimentation ponds, impoundments, spoil or waste disposal facilities, refuse piles, discharges into underground facilities, surface coal mining activities, or coal mine waste fires associated therewith, which require regulation and approval by MSHA.

Findings:

This section is not applicable to the application.

INSPECTIONS

Regulatory Reference: R645-301-514

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are, therefore, no new excess spoil disposal facilities, refuse piles, or impoundments associated therewith.

Findings:

This section is not applicable to the application.

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July 12, 1994

REPORTING AND EMERGENCY PROCEDURES

Regulatory Reference: R645-301-515

Analysis:

The entire Rilda Lease Tract Extension will be underground. There are, therefore, no impoundments and no slide potential associated therewith. The procedure to be followed in the event of temporary cessation of operations is that already stated in the approved plan.

Findings:

The application fulfills the requirements of this section.

PREVENTION OF SLIDES IN SURFACE COAL MINING/RECLAMATION ACTIVITIES

Regulatory Reference: R645-301-516

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There is, therefore, no surface mining associated therewith.

Findings:

This section is not applicable to the application.

OPERATION PLAN

Regulatory Reference: R645-301-520

See specific section below.

GENERAL

Regulatory Reference: R645-301-521

Analysis:

The maps which have been revised for the Rilda Lease Tract Extension are:

Map 1-1 - Coal Ownership Map
Map 1-2 - Coal Ownership Map
Map 1-3 - Mine Permit Area with Mine Development
as of August 3, 1977
Map 2-2--Hiawatha Structure Contour Map
Map 2-2A--Blind Canyon & Cottonwood Structure
Contour Map
Map 2-4 - Isopach Map of the Hiawatha Coal Seam
Map 2-5 - Blind Canyon-Hiawatha Interburden
Isopach Map
Map 2-6 - Isopach Map of the Blind Canyon and
Cottonwood Coal Seams

Map 2-6B - Hiawatha Coal Seam Overburden Isopach
Map 2-6C - Blind Canyon & Cottonwood Coal Seams
Overburden Isopach Map
Map 2-14 - Vegetation Map
Map 2-16 - General Soil
Map 2-18A - Land Use Map
Map 2-18B--Raptor Nesting Location and Habitat
Map 2-19 - Mule Deer Habitat
Map 3-6 - Life of Mine Plan/5-year Increments/Blind
Canyon Coal Seam
Map 3-7--Life of Mine Plan/5-year Increments /
Hiawatha Coal Seam.

These maps have all been revised to show the anticipated mine layout, the surface and subsurface ownership, the surface configuration, and the geology associated with the new lease tract extension. As the entire Rilda Lease Tract Extension is underground, the rest of the mining operation remains as it is represented in the approved plan.

Location in Plan:

Maps 1-1, 1-2, 1-3, 2-2, 2-2A, 2-4, 2-5, 2-6, 2-6B, 2-6C, 2-14, 2-16, 2-18A, 2-18B, 2-19, 3-6, and 3-7.

Findings:

The application fulfills the requirements of this section.

COAL RECOVERY

Regulatory Reference: R645-301-522

Analysis:

The permittee is committed to maximum coal recovery. Mining in the Rilda Lease Tract Extension will be done mainly by longwall methods, which provide the highest coal recovery rates of any available technology. Continuous mining machinery will be used to do the entry development work for the longwall panels and to mine those areas where longwall panels cannot be used.

Location in Plan:

Pages 3-6, 4-69, 4-70.

Findings:

The application fulfills the requirements of this section.

MINING METHOD(S)

Regulatory Reference: R645-301-523

Analysis:

Mining in the Rilda Lease Tract Extension will be done mainly by longwall methods, which provide the highest coal recovery rates of any available technology. Continuous mining machinery will be used to do the entry development work for the longwall panels and to mine those areas where longwall panels cannot be used.

Mining will take place both in the Blind Canyon seam and the Hiawatha seam. Since the Blind Canyon seam lies above the Hiawatha seam, mining has been scheduled to take place first in the Blind Canyon seam.

Location in Plan:

Pages 3-5, 3-6, 4-69, 4-70. Maps 3-6, 3-7.

Findings:

The application fulfills the requirements of this section.

BLASTING AND EXPLOSIVES

Regulatory Reference: R645-301-524

Analysis:

The entire Rilda Lease Tract Extension will be underground. There is, therefore, no surface blasting associated therewith.

Findings:

This section is not applicable to the application.

SUBSIDENCE

Regulatory Reference: R645-301-525

Analysis:

The subsidence monitoring and control plan remains what it is in the approved plan.

The surface of the lease extension, like that of the present permit area, is used mainly for cattle grazing and wildlife habitat, and somewhat less for recreation. There are several natural springs. The only manmade structure in the area which could be adversely affected by subsidence is a 345 kV power line, and this will be protected by a barrier pillar of coal in which only entry development, but no mining, will take place.

To measure subsidence, the permittee will extend the present program of monitoring by aerial photogrammetry to include the lease extension area. The area will be photographed from the air once a year and the amount of subsidence which has occurred during the previous year will be calculated by photogrammetric methods. Cumulative subsidence will then be calculated by comparing the data from the previous year to baseline data which was gathered in August of 1986.

The permittee has taken especial precautions to prevent damage to the escarpment in Rilda Canyon. Volume 3, Appendix IV, of the plan contains the results of a large-scale study of the effects of longwall mining on escarpments in Newberry and Rilda Canyons. This study was commissioned by Interwest Mining Company and was done by W.G. Pariseau of the University of Utah Department of Mining Engineering. Morgan Moon of Energy West Mining Company prepared a summary of the results of this study and how those results were used in the design of the mine layout. This summary is also contained in Volume 3, Appendix IV. Among other things, the longwall panels were widened and their long axes laid out to bear approximately N60° E. Thus laid out, the panels are parallel to the prevailing joint and fault system in the area and oblique to the Rilda Canyon escarpment. This prevents the formation of continuous tension zones along the escarpment crest which might cause it to fail. Although this layout increases the likelihood of ground control problems (pillar bursts and floor heaving), it provides good protection for the escarpments.

The permittee also commits to the mitigation, in general, of subsidence damage. Where cracks or fissures occur which injure or endanger livestock, the permittee will repair the crack or fissure and reimburse the livestock owner for the lost livestock. Where groundwater sources are damaged or impaired by subsidence, the permittee will either directly repair and rehabilitate the water source or else develop an alternative water source in the same area.

Location in Plan:

Pages 4-75 through 4-78, Volume 3, Appendix IV, Maps 3-6, 3-7.

Findings:

The application fulfills the requirements of this section.

MINE FACILITIES

Regulatory Reference: R645-301-526

Analysis:

The entire Rilda Lease Tract Extension will be underground. There are, therefore, no surface facilities associated therewith.

Findings:

This section is not applicable to the application.

TRANSPORTATION FACILITIES

Regulatory Reference: R645-301-527

Analysis:

The entire Rilda Lease Tract Extension will be underground. There are, therefore, no surface transportation facilities associated therewith.

Findings:

This section is not applicable to the application.

HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, & COAL MINE WASTE

Regulatory Reference: R645-301-528

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. No new waste disposal facilities are proposed or anticipated. The current Deer Creek Waste Rock site (approved in 1988) is designed for 30 years plus of mining. The design anticipated future leasing.

Findings:

This section has been complied with.

MANAGEMENT OF MINE OPENINGS

Regulatory Reference: R645-301-529

Analysis:

The entire Rilda Lease Tract Extension operation is an extension of the current underground operations. There are no new breakouts or other mine entries associated with the lease extension application. Pacificorp does have plans to construct ventilation portals in Rilda Canyon in the future, however the application being analyzed at this time does not include those. A separate analysis will be required for any surface facilities application.

Findings:

This section has been complied with.

OPERATIONAL DESIGN CRITERIA AND PLANS

Regulatory Reference: R645-301-530

See specific section below.

SEDIMENT CONTROL

Regulatory Reference: R645-301-532

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are, therefore, no sediment control measures associated therewith.

Findings:

This section is not applicable to the application.

IMPOUNDMENTS

Regulatory Reference: R645-301-533

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are, therefore, no impoundments associated therewith.

Findings:

This section is not applicable to the application.

ROADS

Regulatory Reference: R645-301-534

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are, therefore, no roads associated therewith.

Findings:

This section is not applicable to the application.

SPOIL

Regulatory Reference: R645-301-535

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are, therefore, no new spoil disposal or storage facilities associated therewith.

Findings:

This section is not applicable to the application.

COAL MINE WASTE

Regulatory Reference: R645-301-536

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are no new coal mine waste disposal facilities associated therewith.

Findings:

See section R645-301-528.

REGRADED SLOPES

Regulatory Reference: R645-301-537

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are, therefore, no regraded slopes associated therewith.

Findings:

This section is not applicable to the application.

RECLAMATION PLAN

Regulatory Reference: R645-301-540

See specific section.

NARRATIVES, MAPS, AND PLANS

Regulatory Reference: R645-301-542

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. Therefore, no reclamation narratives, maps, or plans are necessary.

Findings:

This section is not applicable to the application.

RECLAMATION DESIGN CRITERIA AND PLANS

Regulatory Reference: R645-301-550

See specific section below.

CASING AND SEALING OF UNDERGROUND OPENINGS

Regulatory Reference: R645-301-551

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are, therefore, no new breakouts or other mine entries associated therewith. (See section R645-301-529 above). All drill holes or exploration holes will be plugged as per currently approved plans.

Findings:

This section has been complied with.

PERMANENT FEATURES

Regulatory Reference: R645-301-552

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There are, therefore, no permanent surface features associated therewith.

Findings:

This section is not applicable to the application.

BACKFILLING AND GRADING

Regulatory Reference: R645-301-553

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There is, therefore, no backfilling and grading associated therewith.

Findings:

This section is not applicable to the application.

GEOLOGY AND HYDROLOGY

Regulatory Reference: R645-301-600 and R645-301-700

Analysis:

The geologic and hydrologic impacts of this proposal are being analyzed in the Cumulative Hydrologic Impact Assessment (CHIA). This will be a separate document which the reader should refer to.

Findings:

The designs proposed for all anticipated mining operations within the Cumulative Impact Area are determined to be consistent with preventing damage to the extent possible to the hydrologic balance outside the proposed mine plan areas. Refer to the CHIA.

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BONDING

Regulatory Reference: R645-301-800

Analysis:

The entire Rilda Lease Tract Extension operation will be underground. There is, therefore, no additional surface disturbance which would require additional bond.

Findings:

This section is not applicable to the application.

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EAST MOUNTAIN CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Cottonwood/Wilberg Mine, ACT/015/019

Deer Creek Mine, ACT/015/018

Des-Bee-Dove Mines, ACT/015/017

Huntington #4 Mine, ACT/015/004

Crandall Canyon Mine, ACT/015/032

Emery County, Utah

July 1989
Updated September 1994

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I. INTRODUCTION

This updated Cumulative Hydrologic Impact Assessment (CHIA) for East Mountain has been completed based on permit revisions and additional lease extensions for the Deer Creek and Crandall Canyon Mines. This document will include new drawings and information which changes permit areas, lease additions, and the cumulative impact area (CIA). It is not the intent of this document to recreate and change all of the information in the original CHIA because that CHIA was based on current information at that time. The applicable sections listed in the original document will be used in this document to reflect current hydrologic information.

This assessment encompasses the probable cumulative impacts of all anticipated coal mining in the East Mountain area on the hydrologic balance and whether the operations proposed under the applications have been designed to prevent damage to the hydrologic balance outside the proposed mine plan areas. Additional water quality and quantity data collected for groundwater and surface water sites are considered in this CHIA. This report complies with legislation passed under Utah Code Annotated 40-10-1- et seq. and the attendant State Program rules under R645-301-728.

GENERAL INFORMATION

East Mountain is located in the Wasatch Plateau Coal Field, approximately 20 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 10,000 feet.

Precipitation varies from 40 inches at higher elevations to less than 10 inches at lower elevations. The area encompassed by the Wasatch Plateau is 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 which is the major coal-bearing unit within the Wasatch Plateau Coal Field.

VEGETATION

Vegetation of the Wasatch Plateau area is classified within the Colorado Plateau floristic division⁴. The area occupies

parts of both the Utah Plateaus and the Canyonlands 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.

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. cuneata) or mat saltbush (A. corrugata) and may include winterfat (Ceratoides lanata), Mormon tea (Ephedra spp.), budsage (Artemisia spinescens), miscellaneous buckwheats (Eriogonum spp.), Indian ricegrass (Stipa hymenoides), galleta grass (Hilaria jamesii), grama grass (Bouteloua spp.), needle and thread grass (Stipa comata), sand dropseed (Sporobolus cryptandrus) and squirreltail (Elymus elymoides). Greasewood (Sarcobatus vermiculatus) - saltgrass (Distichlis stricta) may dominate bottomlands.

Many sagebrush communities of the area are relatively dense shrub stands of (Artemisia tridentata) with very little understory growth. In relatively undisturbed sagebrush communities, rabbitbrush (Chrysothamnus nauseosus or C. viscidiflorus), Mormon tea, and several perennial grasses may be common, including thickspike and western wheatgrass (Elymus lanceolatus and E. smithii), basin wildrye (Elymus cinereus), Indian ricegrass and dropseed species.

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) may be co-dominant in these communities and may dominate an herbaceous grassland type. Black sage (A. nova) with Salina wildrye or western wheatgrass also common.

Pinyon-juniper woodlands occupy drier sites often with stoney to very rocky soils. Pinus edulis and Juniperus osteosperma 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 (Elymus trachycaulus), Salina wildrye, junegrass (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 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) 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 (Mahonia repens), chokecherry (Prunus virginiana), Rocky Mountain maple (Acer glabrum), mountain lover (Pachistima myrsinites) and snowberry. Bluebunch wheatgrass (Elymus spicatum), mountain brome (Bromus carinatus), 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.

Engelman spruce (Picea engelmannii) and subalpine fir (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), red osier dogwood (Cornus stolonifera), skunkbush (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 flows either to the Price River or the San Rafael River, both tributaries to the Green River. 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 is about 2,300 square miles in three counties and 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 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 parts of two physiographic sections of the Colorado Plateau - The High Plateaus to the north and west and Canyonlands to the south and east⁷. The San Rafael River originates as tributary streams in the upper Wasatch Plateau. Principal tributaries are Huntington Creek, Cottonwood Creek and Ferron Creek which merge to form the San Rafael River about six miles southeast of Castledale, Utah. The San Rafael River flows in a southeasterly direction through the San Rafael Swell joining the Green River about fifteen miles south of Green River, Utah.

The water quality of both the Price River and the San Rafael River 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 which are major contributors to poor water quality. Depending upon the duration of contact, water quality degrades downstream with Total Dissolved Solids (TDS) levels of 4,000 milligrams per liter (mg/l) 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.

In the high mountain tributaries, the lowest dissolved solids concentrations occur during high flows associated with the spring snow melt. The highest dissolved solids concentrations occur during late summer when low flow conditions exist. The predominant ions found in the mountain streams during both high flows and low flows are: calcium, magnesium and bicarbonate.¹¹

The lowland stream reaches contain the highest dissolved solids concentrations in late summer during low flow conditions and as irrigation return water is placed back into these streams.

The predominant ions during high flow are calcium, magnesium and bicarbonate and during low flow periods, the predominant ions are sodium, calcium and sulfate.¹¹

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^{6, 10}.

Ground-water is often associated with faulting and fracturing where these geologic structure provide secondary porosity and serve as conduits for rapid groundwater movement both vertically and horizontally. Surface waters readily infiltrate into these fault systems which may then rapidly migrate until contacting impervious material. These faults and fractures often have significant quantities of water stored within the fault gouge.

II. CUMULATIVE IMPACT AREA (CIA)

Figure 2 delineates the CIA for current and projected mining in the East Mountain area. The CIA encompasses approximately 68 square miles and includes East Mountain. The western and eastern CIA boundaries are designated by Huntington Creek and Cottonwood Creek, whereas the southern extent is bounded by sections 8,9 and 10, T18S, R7E, and the northern boundary is defined by the Left Fork of Huntington Creek. The west side of the Crandall Canyon mine permit area was recently extended due to the acquisition of additional leases. This area drains several small ephemeral drainages to Indian Creek and Scad Valley Creek both perennial streams in Joe's Valley. The hydrologic connection between the drainages and Indian Creek is thought to be at the surface only due to the regional dip of the strata towards Huntington Creek.

III. SCOPE OF MINING

The federal coal leases that are designated in the East Mountain "Logical Mining Units" are as follows:

Leases

PacifiCorp

COTTONWOOD/WILBERG, DEER CREEK, AND DES-BEE-DOVE MINES

The Cottonwood/Wilberg Deer Creek, Des-Bee-Dove Mines represent three adjacent and overlapping permit areas encompassing about 29,000 acres.

Cottonwood/Wilberg

SL-64900, U-1358, U-083066, U-040151, U-44025, U-47978, and portions of SL-070645-U-02292, U-084923, and U-084924.

Deer Creek

SL-064607-064621, SL-064900, U-1358, SL-070645, U-02292, U-84923, U-084924, U-083066, U-040151, U-044025, U-014275, U-024319, and U-47979. Additional leases included in the Rilda lease extension include leases U-7653, U-47977 and SL-050862 and U-06039. Future coal leases on the north side of Rilda canyon which are not permitted are: U-024317, U-2810 and SL-051221.

Des-Bee-Dove

U-02664, SL-050133, and SL-066116.

Genwal Coal Co.

Crandall Canyon Mine

The Crandall Canyon Mine is isolated from the previous three mines. It includes leases ML-21569, U-66838, ML-21568 and UTU-69082 which total about 3200 acres.

Mountain Coal Co.

Huntington #4 Mine

The Huntington #4 Mine operated in Federal Lease No. U-33454 and SL-064903.

SCOPE OF MINING

Cottonwood/Wilberg Mine

Coal mining operations have been conducted since the 1890's in the Wilberg area. Utah Power and Light Company (UP&L) acquired the Wilberg Mine in September 1977 from the Peabody Coal Company, which had acquired the lease in 1958. Mining had previously been conducted under the original owner, Cyrus Wilberg, beginning in 1945. With the UP&L acquisition, the Wilberg Mine was redesigned. PacifiCorp acquired the UP&L properties in February 1990.

A tragic fire occurred in December of 1984. On July 1, 1985, it was decided to divide the Wilberg Coal Mine into two separate and independent coal mines; the Cottonwood and the Wilberg Coal Mines, each with a separate MSHA identification number. The mining and reclamation permit, however, was designated as ACT/015/019 for the Cottonwood/Wilberg Mine because the surface facilities were shared by each mine.

Longwall mining and limited room and pillar mining produces about 2.5 million tons from the Hiawatha and Blind Canyon seams. Mining is scheduled to cease around the year 2022.

Underground development waste, sediment from sedimentation ponds and trommel reject from the Des-Bee-Dove and Cottonwood/Wilberg Waste Rock Storage area approximately 1 mile south of the Cottonwood/Wilberg Mine. This disposal structure utilizes a maximum of sixteen acres and is part of approved BLM Right of Way: U-37642.

Deer Creek Mine

UP&L purchased the Deer Creek Mine in 1977 from Peabody Coal Company, which had acquired leases on the Deer Creek property and began operations in 1969. Coal mining operations had taken place on fee land in Deer Creek Canyon prior to 1946 when the first federal coal lease was issued in this area. PacifiCorp acquired the UP&L properties in February 1990.

Operations at the Deer Creek Mine overlap those of the Wilberg Mine, predominantly in the Blind Canyon Seam. The Deer

Creek Mine surface facilities are located on a 25-acre site at the junction of Deer Creek Canyon and Elk Canyon.

The Deer Creek Mine utilizes the longwall mining method and produces about 2.5 million tons per year from the Hiawatha and Blind Canyon seams. All underground operations are scheduled to cease around the year 2032.

Waste rock generated at the Deer Creek Mine has been placed into two areas at the main mine site. These two disposal sites are at capacity and the permittee has acquired a third site on the north side of Huntington Canyon. This site is located within the Gentry Mountain CIA and is discussed there.

Des-Bee-Dove Mine

The Des-Bee-Dove Mine complex (the Deseret, Beehive and Little Dove Mines) was acquired by UP&L in 1972 from the Deseret Coal Company, a Mormon Church enterprise. The Mormon Church and the Castle Valley Fuel Company mined the property from 1938 to 1947. From 1936 to 1938, the mine workings were operated by two men, Edwards and Broderick. Mining began in the canyon in 1898 as the Griffith Mine. PacifiCorp acquired the UP&L properties in February 1990.

The Des-Bee-Dove Mine permit area contains two mineable coal seams, the Hiawatha and Blind Canyon seams. The mining plan consists of a series of room and pillar continuous mine sections.

The Des-Bee-Dove Mine ceased operations on February 6, 1987. PacifiCorp is currently maintaining the site in an indefinite "temporary cessation" phase until the coal market improves. This mine may not be reactivated. Before UP&L temporarily ceased operations, the Des-Bee-Dove Mine produced 725,000 tons per year and projected that mining would end in the year 1998.

Huntington #4 Mine

The Huntington Canyon #4 Mine permit area contains 1,320 acres. The underground operations utilized room and pillar mining methods in the Blind Canyon and Hiawatha coal seams in Federal Lease No. U-33454 and SL-064903. All underground mine operations ceased November 1, 1984.

Beaver Creek Coal Company reclaimed the site from August 15, 1985 through September 30, 1985. Three portals and one opening were sealed, regrading and backfilling of the pad and road areas was completed, soil replaced, and reseeding done. The reclaimed site has been maintained since that time. Beaver Creek Coal Company was bought by Mountain Coal Company and the permit was transferred on September 12, 1991. In 1993, Mountain Coal Company applied to the Division for Phase II bond release. This application is under review and is still pending Division approval.

Crandall Canyon Mine

Historically, mining had been conducted in Crandall Canyon from November 1939 through September 1955. Mining in Tract 1 by Genwal Coal Company began in 1983.

The permit area for the Crandall Canyon Mine contains approximately 158 acres in Huntington Canyon in Emery County, Utah. The current method of room and pillar mining for Federal Lease SL-062648 will be continued throughout Lease U-54762. Pillars will be removed upon abandonment of sections. Overall, an advance-retreat mining system is projected for the mine.

Other leases included in the permit area are ML-21569, U-66838 and ML-21568. Additional leases were acquired by Genwal to the west of the existing mine area in March 1994. This lease by assignment includes lease UTU-69082 which is about 3,000 acres.

IV. STUDY AREA

GEOLOGY

The East Mountain CIA is characterized by cliffs, steep slopes, narrow canyons and high plateaus. Stratigraphic units outcropping within the area include, from oldest to youngest, the Mancos Shale, Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone and Quaternary deposits. Lithologic descriptions and unit thickness are given in Figure 3.

Rocks in the study area strike northeast and dip from one to three degrees to the southeast. The major structural features occurring within East Mountain are: Deer Creek Fault; Roans Canyon Fault Graben; Pleasant Valley Fault; the Mill Fork Graben; and the Straight Canyon Syncline. The Deer Creek Fault and Pleasant Valley Fault trend north - south, whereas Roan's Canyon Fault Graben, Mill Fork Graben and the Straight Canyon Syncline trend northeast - southwest. Fault displacements range from several feet to approximately 170 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 through solution processes and fracturing. Shale, siltstone, mudstones and cemented sandstone beds act as aquacludes to impede ground-water movement.

The Mancos Shale is considered a regional aquaclude that limits downward flow within the CIA. Localized aquacludes include relatively thin, impermeable lithologies occurring within the stratigraphic sections above the Star Point Sandstone.

The Star Point-Blackhawk aquifer is present and represents the only identified regional ground-water resource in the study area⁶. Ground water associated with the Price River Formation and North Horn Formation may be characterized as occurring within an extensive system of "perched" aquifers 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 north-south and northeast-southwest trending fault or fracture zones (Figure 4). In particular, the Roans Canyon Fault Graben appears to act as a significant conduit for ground water.

Drilling from the Deer Creek Mine identified two major hydrogeologic units associated with the Roan's Canyon Graben. Aquifer testing indicated the horizontal flow component within the graben is towards the east and suggests discharge occurs into the Huntington Creek drainages basin.

The Straight Canyon Syncline is also thought to direct ground-water movement towards the southwest into the Cottonwood Creek drainage basin.

Data from seven boreholes located within the Cottonwood/Wilberg Mine suggest that ground-water in the Star Point Sandstone is moving towards the northeast. This flow direction could be associated locally with the southern extent of the Straight Canyon Syncline. Other, more regional data indicate ground water moves from north to south.

Approximately 309 seeps and springs occur within the CIA. Total spring discharge exceeds 2,378 gpm (3,800 acre feet/year). Flow data is not available for all of these identified springs. The average flow was calculated for springs emanating from

specific formations and then total spring flow from each formation was estimated by multiplying the average flow by the number of springs. Spring discharge is distributed as follows:

<u>Lithologic Unit</u>	<u>Number of Springs</u>	<u>Total Discharge</u>
Flagstaff Limestone	8	25 gpm
Undifferentiated Flagstaff Limestone/North Horn Formation	5	34 gpm
North Horn Formation	125	1,325 gpm
Undifferentiated North Horn Formation/Price River Formation	3	25 gpm
Price River Formation	82	519 gpm
Castlegate Sandstone	17	55 gpm
Blackhawk Formation	52	135 gpm
Star Point Sandstone	15	260 gpm

Analysis from spring samples indicates that water quality progressively decreases from the Flagstaff Limestone to the Star Point Sandstone.

Mine inflow is estimated to total 1,500 gpm for the Deer Creek Mine and Cottonwood/Wilberg Mine and 100 gpm in the Crandall Canyon Mine. Mine water is discharged to the Left Fork of Grimes Wash and Miller Canyon from the Cottonwood/Wilberg Mine and to the Huntington Power Plant and Deer Creek from the Deer Creek Mine. Mine water is not discharged at the Crandall Canyon Mine or Des-Bee-Dove Mine. No discharge occurs at the reclaimed Huntington #4 Mine.

Mine water intercepted within the CIA represents ground-water depletion from storage in the Blackhawk Formation and Star Point Sandstone and/or interception of flow along faults/fractures or from fluvial channels in the mine roof.

SURFACE WATER

The CIA has been divided into fourteen major drainage basins. The CIA encompasses drainages to Huntington Creek and Cottonwood Creek, both tributaries to the San Rafael River Basin (see Figure 5).

Crandall Canyon (4)

Crandall Canyon drainage (4) includes the disturbed area associated with the Crandall Canyon Mine. The mine exists in the

lower reaches of this watershed which encompasses 3,332 acres. The average gradient of Crandall Creek is 16 percent. Crandall Creek is perennial and flows east into Huntington Creek.

Mining is centered in the lower reaches of the drainage area and involves approximately 162 acres, of which 9.7 acres is surface disturbance. All surface disturbance is treated by maintained sediment controls.

Additional leases have been acquired by Genwal Coal Company to the west of the existing mine workings. These leases extend the permit area north into Blind Canyon and Horse Canyon. These new lease additions abut the Joe's Valley Graben which creates a barrier to further mining to the west.

Little Bear Canyon and Mill Fork Canyon (5 and 6)

Approximately 3,869 acres drain from Little Bear Canyon and Mill Fork Canyon combined. The Huntington #4 Mine encompasses approximately 1,320 acres with these two canyons. Reclaimed surface disturbance involves 12.5 acres in Mill Fork Canyon. Little Bear Creek is considered ephemeral and Mill Creek is considered perennial in its lower reaches. The average gradient of Little Bear Creek is 30 percent and the average gradient for Mill Creek is 13 percent.

The Huntington #4 Mine was reclaimed in 1985 and has maintained sediment controls in place through the bonding period. Mountain Coal Company has applied for phase 2 bond release. PacifiCorp leases in the Rilda Canyon area extend into the south half of Mill Fork Canyon and includes 390 acres in Mill Fork.

Rilda Creek (7)

Approximately 4,119 acres drain into Rilda Canyon. Rilda Creek is perennial due to several large springs found in the middle reaches of the creek. The average gradient of Rilda Creek is 11 percent.

The permit area of the Deer Creek Mine includes areas in Rilda Canyon. Previous surface disturbances were associated with the Helco Mine Rominger Mine. The North Emery Water Users Association (NEWUA) controls several springs adjacent to the Helco Mine. These springs have been developed and are used as culinary water. Reclamation of the abandoned Helco Mine was done in 1988 by the Division's Abandoned Mine Reclamation Program. This work included six portal closures, removal and burial of coal waste piles followed by revegetation. PacifiCorp's permit area encompasses 2,417 acres in the Rilda Canyon drainage.

PacifiCorp has proposed constructing a ventilation breakout up the Left Fork in Rilda Canyon. This proposal includes construction of a 1.2 acre pad with three portals. The pad will support portal liners, a substation, ventilation fan, water

storage tank and a pumphouse. A 12 foot wide gravel road will connect the pad to the Rilda Canyon road. Approximately 1350 feet of road will be added in Rilda Canyon. This proposal has been submitted to the Division and is currently under review. Sediment controls will be installed and maintained during construction and operation.

Meetinghouse Canyon and Deer Creek Canyon (8 and 9)

Approximately 4,469 acres drain Meetinghouse Canyon and 3,218 acres drain Deer Creek Canyon. Meetinghouse Creek is considered ephemeral and Deer Creek is considered perennial. The average gradient of Meetinghouse Creek is 12 percent and the average gradient of Deer Creek is 13 percent. Approximately 56 acres of surface disturbance associated with the Deer Creek Mine is located in the middle of Deer Creek Canyon. The surface facilities are treated by sediment controls and all coal produced at the mine is conveyed to the Huntington Power Plant located adjacent to Huntington Creek near the bottom of Deer Creek Canyon.

Meetinghouse Canyon contains 4,090 acres and Deer Creek contains 2,998 acres of PacifiCorp's permit area. Mine ventilation breakouts have been established in Meetinghouse Canyon. No other mine related surface disturbance occurs in Meetinghouse Canyon.

Maple Gulch and Danish Bench (10 and 11)

Approximately 4,338 acres is associated with the drainage area of Maple Gulch and approximately 3,708 acres is associated with the drainage area of Danish Bench. Both areas are primarily Mancos Shale flats draining away from the southeastern end of East Mountain. The area lacks the steeply incised canyons found in some of the other drainages within the CIA. Danish Bench drains to Cottonwood Creek and has an average gradient of 12.5 percent. Maple Gulch drains to Huntington Creek and has an average gradient of 17 percent. Permit areas of the PacifiCorp mines encompasses 837 acres of Maple Gulch and 250 acres of Danish Bench. Neither area contains any surface disturbance associated with mining.

Grimes Wash (12)

Approximately 7,426 acres is associated with the Grimes Wash drainage. The Cottonwood/Wilberg Mine is situated within Grimes Wash and includes 31 acres of surface disturbance which is treated by sediment controls. The average gradient of Grimes Wash is 14 percent. PacifiCorp's Cottonwood/Wilberg Mine permit area encompasses 4,120 acres of the Grimes Wash drainage.

Cottonwood Creek (13)

This drainage encompasses 8,942 acres and includes all drainage to Cottonwood Creek along the western half of the CIA area. It has many small canyons and contains 12 acres of surface

disturbance associated with the Cottonwood Fan Portal area of the Cottonwood/Wilberg Mine. This area is treated by sediment controls and is partially reclaimed. The portion of PacifiCorp's permit area contained in this drainage is 5,120 acres. There is a portal in Miller Canyon which drains mine water from the Cottonwood/Wilberg mine to Cottonwood Creek.

Drilling conducted in August 1992 upward from the Cottonwood Mine into flooded panels of the Deer Creek Mine released significant quantities of water into the Cottonwood Mine. Portions of this water was discharged from the mine portals into Grimes Wash and portions were discharged from the breakout in Miller Canyon.

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 on ground-water recharge should be minimal since mining will create surface disturbance of less than 150 acres of the 44,000 acre CIA. Disturbance of phreatophytic vegetation (primarily cottonwood and some willow) is negligible.

The Cottonwood/Wilberg Mine Waste Rock Storage area is located below the coal resource on Quaternary sediment gravel that directly overlies the Masuk member of the Mancos Shale. Inasmuch as the Mancos Shale is considered a regional aquiclude, the storage facility presents a low risk for impacting ground-water resources.

Dewatering.

The Deer Creek Mine and Cottonwood Mine have discharged an average of 2,206 gpm (3,600 acre feet/year) since January 1990. This average is high due to large quantities of water encountered by the Deer Creek Mine in 1990. The volume of water has diminished significantly since its initial interception and in 1993 the average discharge rate was 1,342 gpm (2,200 acre feet/year). The Crandall Canyon Mine continues to intercept about 100 gpm (161 acre feet/year) with no discharge from the mine. The volume of water being discharged from mines within the CIA (3,700 acre feet/yr.) approximates the amount of water that is currently being withdrawn from the ground-water system. The volumes of water discharged from the Deer Creek and Cottonwood/Wilberg Mines are presented in the table below as an average discharge in gallons per minute (GPM)*. The current 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.

MONTH	DEER CREEK & COTTONWOOD/WILBERG MINES Average Discharge Per Minute (GPM) ¹⁸			
	1990	1991	1992	1993
January	1,683	2,985	1,901	1,939
February	2,433	2,634	1,796	1,775
March	2,287	2,088	1,710	1,347
April	3,190	2,817	1,872	827
May	3,339	2,653	1,890	770
June	2,958	2,629	853	788
July	3,189	2,467	2,325	985
August	3,248	2,267	3,433	1,156
September	3,367	2,464	3,268	1,254
October	3,085	2,204	2,211	1,455
November	2,873	2,128	2,210	1,340
December	3,087	2,176	2,073	1,133
AVERAGE	2,895	2,459	2,129	1,342

* The Crandall Canyon Mine encounters about 100 gallons per minute. This water is utilized for in mine purposes and is not discharged from the mine.

Approximately 44,273 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 is 73,803 acre-feet. Approximately 12 percent of the annual precipitation contributes to recharge.¹⁴ Thus 12 percent of 73,803 produces about 8,900 acre feet of recharge water per year for the entire CIA area.

Table 1A gives estimates for the total annual discharge of springs from water-bearing rock units that overlie the coal resource.

Table 1a. Precipitation and Spring Discharge Estimates for Areas Above the Coal Resource. East Mountain CIA.

<u>Lithologic Unit</u>	<u>Outcrop Area (acres)</u>	<u>Precipitation on Outcrop (acre-feet)</u>	<u>Total Annual Discharge of Springs (Percent of annual precipitation on outcrop)</u>
Undivided Flagstaff Limestone, North Horn Formation, Price River Formation	27,007	45,021	3,100 (6.9%)
Castlegate Sandstone	5,020	8,368	100 (1.1%)
Blackhawk Formation, Star Point Sandstone	12,246	20,414	600 (3.1%)
TOTAL		73,803	3,800 (5.2%)

Discharge also occurs directly to perennial streams where channels intersect ground water within the Blackhawk Formation and Star Point Sandstone. The six perennial streams that occur within the CIA are: Crandall Creek, Mill Fork Creek, Rilda Creek, Grimes Wash Creek, Cottonwood Creek, and Huntington Creek. All of these streams intersect the lower Blackhawk Formation and Star Point Sandstone.

A study conducted along Miller Creek in the adjacent Gentry Mountain area indicated that streamflow substantially increased from 8 to 115 gpm) as a result of discharge from the Blackhawk Formation and Star Point Sandstone⁵. The results from the Miller Creek Study suggest perennial streams that traverse the regional aquifer sustain similar ground-water discharges (or base flow recharge). Accordingly, total base flow recharge to perennial streams is estimated to be 1,000 acre feet per year.

Table 1B lists estimated ground-water discharges to perennial streams and from mines.

Table 1B. Estimated Ground-water Discharge to Perennial Streams and from Mines. East Mountain CIA.

Discharge to Perennial Streams (6 total)	1,000 acre feet
Discharge from Mines (3 total)	<u>5,000</u> acre feet
Total	6,000 acre feet

Table 1C 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 mine elevation. Average relative humidity data

from the Central Weather Station in the Manti-LaSal National Forest were also used in the psychrometric calculation.

Table 1C. Approximate Atmospheric Discharges from Active Mines, East Mountain, CIA.

<u>Mine</u>	<u>Approximate Discharge Rate (gpm)</u>
Cottonwood/Wilberg Mine	36
Deer Creek Mine	36
Crandall Canyon Mine	<u>10</u>
TOTAL	82

Total ground-water discharge within the CIA (summed from Tables 1A, 1B, and 1C) is currently about 9,900 acre-feet, where 48 percent (4,800 acre feet) of the total represents natural discharge to streams and springs and 52 percent (5,100 acre feet) results from mining activities.

Lines (1985) investigated the adjacent 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 East Mountain CIA allows depletion of regional aquifer storage and discharge to be estimated at 4,100 acre feet per year and 1,000 acre feet per year respectively. Mining is progressing to the north away from the Straight Canyon Syncline and the Roans Canyon Fault. These two geologic structures were associated with the large quantities of water encountered. As mining progresses further north limited quantities of groundwater are not anticipated. This has already been observed in the Rilda Canyon area.

Recent mine plan proposals were changed in areas of Rilda Canyon where underground mining posed greater risk to damage the alluvial stream channels due to shallow overburden. Three longwall panels in the Left Fork of Rilda Canyon were removed until sufficient information is available to better determine potential impacts to the stream channel.

PacifiCorp is accessing coal reserves for the Deer Creek Mine through a rock tunnel across the Roans Canyon Fault Graben. A drilling and testing program identified two water-bearing zones within the graben. The permittee pressure grouted the water-bearing zones during development of the rock tunnel. It was not anticipated that the diversion of ground-water flow within the Roans Canyon Fault Graben would exceed a total of 100 gpm.

In the fall 1990, the Deer Creek Mine intercepted a fault associated with the Straight Canyon Syncline and the Roans Canyon Graben which initially produced about 2,000 GPM. This water flooded the mine and created a need for an emergency discharge of

mine water. This emergency discharge was granted to PacifiCorp by the Bureau of Water Pollution Control on November 16, 1990. The volume of water requiring discharge has continued to decrease during the last several years. The total mine water flow discharged from the Deer Creek Mine averaged 1,342 gallons per minute in 1993.

These flows have been reduced due to the reduction in mine water inflows following localized dewatering and because some mine water is being sumped into sealed abandoned mine workings or into the Cottonwood Mine.

Entry development north of the Roans Canyon Graben has encountered little additional inflows. Following the cessation of mining, the discharge of ground water to the Left Fork of Grimes Wash, Miller Canyon, Huntington Power Plant and the atmosphere will cease and the mine workings will begin to flood.

The impact associated with the reduction in surface flow is considered temporary. Mine flooding may 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 (14,000 acres) will remain open (average 5 foot height) and caving will not occur. Accordingly, for workings that experience inflow (Cottonwood/Wilberg Mine, Deer creek Mine, Crandall Canyon Mine) 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 into the rocks initiates. New seeps and springs may begin to appear as this mine water moves laterally towards the outcrops.

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 "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. Springs situated below the mine elevation may also be reduced as water which normally flows downward past the coal seam to these springs is intercepted and diverted from the mine. Increased flow rates along subsidence fractures may reduce ground-water residence time and potentially

improve water quality. Water accumulating inside abandoned mine workings may pick up and dissolve rock dust and other constituents thereby decreasing water quality.

Mining will occur beneath approximately 13 springs that have a combined flow in excess of 625 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.

Investigations in 1993, by the U.S. Bureau of Mines indicates that springs situated above mine workings on East Mountain do not display impacts to the degree once anticipated. (personal communication, Liane Kadnuck, U.S Bureau of Mines) These springs are located in areas where maximum subsidence of 26 feet has been documented. Springs located at or below the mine workings elevations may be at higher risk of impact due to interception, dewatering and diversion of groundwater away from the spring's point of surfacing.

In August 1991, the Division received a citizen complaint regarding the loss of flow in the Cottonwood Spring located in Cottonwood Canyon upstream from the Trail Mountain Mine. This complaint implicated the Deer Creek Mine for the loss of flow. In response to this complaint, the Division began analyzing what data was available for this spring. Examination of water quality data which was gathered by the Trail Mountain Mine. Stiff diagram and trilinear plots were generated from these data. According to these plots, the water quality of the Cottonwood Spring was very stable over several seasons. The Stiff Diagrams did not vary between sampling times. This indicates that water from the spring was probably originating within a geologic strata and not from sub-surface flow in the canyon alluvium. The water associated with a stream and alluvial floor varies seasonally due to fluxes of higher quality water during spring snowmelt and more concentrated dissolved ions during low flow periods.

PacifiCorp, in response to Division requests, drilled monitoring wells at four sites in Cottonwood Canyon. At each site two wells were drilled. One was completed into the alluvial deposits near the surface. The second well penetrated the upper tongue of the Star-Point Formation.

Resistivity surveys were also conducted up Cottonwood Canyon along the axis of the streams and at various cross sections to the streams. The resistivity surveys have been used to help identify geologic anomalies and zones of potential water producing strata. According to the PacifiCorp report, the water in the Cottonwood Spring originated from water coursing through the alluvium which was then forced to the surface by the Roans Canyon Fault across Cottonwood Creek. The water levels in the Cottonwood wells has remained fairly stable.

Additional water may have contributed to this spring from geologic sources to the north. According to the analysis of the well monitoring and the resistivity the alluvial water in the canyon bottom was about 12 feet below the point where the spring originated. This is in response to the continuing drought which has been occurring for the last 7 years. PacifiCorp contends that should adequate precipitation occur to refill the alluvial system, then spring flow would commence. This phenomena has yet to occur.

SURFACE WATER

The cumulative impacts associated within the CIA will be summarized by individually discussing impacts associated with the Crandall Canyon Mine, Huntington #4 Mine, Deer Creek Mine, Cottonwood/Wilberg Mine and the Des-Bee-Dove Mine. Creeks and drainage areas which are referenced by (#) or discussed, are shown on Figure 5, Surface Water Drainage Map. Water monitoring locations within the CIA are shown on Figure 7, Water Monitoring Locations.

Cottonwood/Wilberg Mine. The Cottonwood/Wilberg Mine is located in Grimes Wash. Grimes Wash drainage water quality is greatly affected by the influx of the Right Fork. The Right Fork originates in the North Horn Formation (interbedded shale, siltstones, and sandstones), which is abundant with calcareous material. As a result, the Right Fork contributes a relatively high amount of suspended and dissolved solids to the Grimes Wash drainage. The greatest factor influencing the dissolved solids level in the Right Fork drainage during 1988 was the sudden increase in temperature.

As reported in 1985, the TDS level increased slightly at the location below the mine. Two possible factors stated for the rise were Cottonwood/Wilberg Mine Discharge and Mancos Shale seeps. Due to the fact that no water was discharged from the mine during 1985 through 1988 (one exception in August 1986), seeps emanating from the Mancos Shale probably have the greatest influence upon the TDS level. Periodic sampling during 1986 and early 1987 confirmed the seeps' contribution to the TDS level. The average TDS level for the four samples collected was 1,188 mg/l, representing a nearly 3.3 fold increase over the historical averages for the Right and Left Forks. ¹⁷ (Annual Hydrologic Monitoring Report for 1988, pg. 24).

All surface facilities are treated by sediment controls and as such, there is little potential impact from sediments generated within disturbed areas.

Waste rock generated from the Des-Bee-Dove and Cottonwood/Wilberg Coal Mines is disposed of in a series interconnected storage cells (Figure 4). The waste rock storage site is located at the 6,800 foot elevation. Annual

precipitation is approximately 14 inches, and the vegetation surrounding the waste rock storage area is the pinyon-juniper community type.

Each completed waste rock containment structure consists of over four feet of shot and crushed coal, sandstone, and mudstone rock. The expected waste rock encountered will be approximately 35 percent sandstone, 30 percent interbedded mudstone and siltstone, and 45 percent boney coal. Sediment pond clean out waste is also disposed of at this site.

Roof and floor materials are sandy loam to loamy sand in nature. Analyses of roof and floor material indicate high Sodium Adsorption Ratios (SAR) (Mean=17.36, Standard Deviation=25.14), and movement of sodic materials is typically associated with hydroscopic rise and leaching processes. High SAR in the waste rock storage area should not be a concern to water quality because drainage from the storage site flows into a sediment pond and discharges should be minimal.

Analyses from Drill Hole EM-23C, indicates low pH (3.3, 2.9, 3.7) within the mudstones and siltstones directly below the Hiawatha Coal Seam. Additionally, roof and floor analyses indicate high pyritic/marcasite levels (%Fe₂ Mean=8.15, Standard Deviation=10.82). The colluvium and Mancos Shale which underlies the waste rock storage area is calcareous and should be sufficient to neutralize drainage or seepage from areas within the waste rock storage site, which could potentially become acidic.

Although most water associated with the Cottonwood/Wilberg Waste Rock Storage Area will evaporate, some water will inevitably percolate through the storage cells and underlying colluvium deposits. Eventually seepage would contact the Mancos Shale and further degradation (increased TDS and EC) of water quality would take place. Accordingly, drainage from the waste rock storage site would have little down gradient effect.

Deer Creek Mine. Referencing Table 1D, it is apparent that the quality of Deer Creek runoff degrades from the upper to lower sampling points. The upper stream site is dominated by a calcium, bicarbonate system. The quality of the lower point is affected by the Mancos Shale and is dominated by chloride, sulfate and sodium. Data from 1993 compared very well with the historical water quality information.¹⁹

Table 1D. Deer Creek Water Quality.

		<u>Calcium</u>	<u>Chloride</u>	<u>Conductivity</u>	<u>Magnesium</u>	<u>Sodium</u>	<u>Sulfate</u>	<u>TDS</u>	<u>TSS</u>
Above	Max	82.0	176.0	1580	183.9	111.6	255.0	897	3592.0
Mine	Mean	49.5	19.2	581	37.5	27.5	63.8	335.0	124.9
1993		51.2	56.2	790	41.3	43.9	137.4	496.3	14.1
Below	Max	112	420.0	2300	122.8	233.8	500.0	1544	20540.0
Mine	Mean	73	120.4	1153	67.0	114.9	215.8	684	490.9
1993		52.7	58.5	785	40.6	43.6	136.6	491	12.6

Deer Creek sediment pond discharge has been historically within UPDES limits, but discharges of high Total Dissolved Solids may degrade downstream water quality.

All surface drainage facilities are designed to safely control water and sediment runoff from all disturbed areas. In addition, all surface water originating from undisturbed lands upstream of the facilities area will be controlled and diverted through the mining operation in large Corrugated Metal Pipe. Storm runoff from within the mine facilities area is collected in a system of open ditches, bermed roadways and culverts, and diverted into the sediment pond prior to its discharge into Deer Creek below the facilities area.

The sediment pond is designed to detain the 10-year, 24-hour storm event. It should be noted that when the design event is exceeded (i.e. storms larger than the 10-year, 24-hour storm), sediment detention times will be reduced, leading to a slightly higher sediment load in Deer Creek. The UPDES permit for the sediment pond incorporates this into the monitoring requirements during storm events.

Runoff from 25 acres of disturbed land will be temporarily detained in the Deer Creek Mine sediment pond and will be released to Deer Creek within UPDES limitations. The surface-water impact associated with the Deer Creek Mine operations will be minimal.

Reclamation of the drainage at the Deer Creek Mine will consist of removing the temporary drainage system, diversion and sedimentation pond. The plan as currently approved allows for the construction of permanent channels over the refuse material and into a splash basin. The Utah program regulations currently require all diversions to be routed away from fill. A Division order is being prepared to address this permit deficiency. This reclamation plan will have negligible impact on water quantity or quality of Deer Creek and its tributaries.

Des-Bee-Dove Mine. The Des-Bee-Dove Mine complex ceased operations in February 1987 for economic reasons and is in an indefinite "temporary cessation". This mine is a dry mine and all surface drainage is treated by a sediment pond and released

to an ephemeral wash. Since all surface water is treated by a maintained sediment pond, the effects of the Des-Bee-Dove Mine operations on the hydrologic balance are negligible.

Huntington #4 Mine. The major aquatic habitats within the permit area are Mill Fork and Little Bear Creek. All reclaimed mine lands are within Mill Fork Canyon. Based on benthic macroinvertebrate and aquatic habitat surveys conducted by the operator and on data provided by the Utah Division of Wildlife Resources, neither creek supports game or non-game fish and both lack sufficient flow in most years to provide spawning sites. However, these streams probably contribute some invertebrate food items and a small amount of surface flow to Huntington Creek, an important fishery in the region.

The mine is currently reclaimed and all surface structures have been removed and all disturbed areas reseeded. Sediment controls are in place (i.e. sediment ponds) and there is no anticipated impact to Mill Creek from the Huntington #4 Mine due to the lack of potential sources of impact. Mountain Coal Company recently requested a Phase II bond release. This request is pending Division review and approval.

Crandall Canyon Mine. Crandall Canyon Mine is located in Crandall Canyon. The U.S. Geological Survey established a gauging station at the mouth of Crandall Canyon Creek in 1978. Flow data collected at the gauging station are not complete for the winter in most years, due presumably to data acquisition problems. However, the limited data indicate that most of the flow of Crandall Canyon Creek occurs in the period of May through July. Assuming an average of 30 acre-feet per month for the period when records were missing, the average annual flow for the six-year period of data was 2,740 acre-feet or 457 acre-feet per year.

Surface water quality data collected from Crandall Canyon Creek by Genwal Coal Company for the Tract 1 Lease from 1985 indicate that the dominant ions in Crandall Canyon Creek are calcium and bicarbonate. Total dissolved solids concentrations in the stream have varied from 180 to 286 milligrams per liter, with lower concentrations normally occurring during the high flow season. Total suspended solids concentrations in Crandall Canyon Creek have varied during the period of record from 0.5 to 208.0 milligrams per liter. As expected, the highest suspended solids concentrations generally occur during periods of highest flow.

The main concern in terms of impact to surface water is water quality deterioration downstream from the minesite, primarily in the form of suspended sediments. Typically the suspended sediment concentration in Crandall Canyon Creek since 1983 varied from approximately 205 mg/l to 0.5 mg/l. Low

suspended sediment values are associated with natural climactic and geologic process although a proportion may be attributed to surface disturbances from roads and the mine pad area. Sediment controls do exist for the disturbed surface areas. Therefore, the impact associated with mining in Crandall Canyon is minimized by surface controls (i.e., sediment pond, diversions, etc.).

VI. SUMMARY

Mine operations within the CIA currently intercept regional aquifer flow at an approximate rate of 5,100 acre feet per year. Of this total, approximately 300 acre feet are consumptively lost to mine ventilation and uses underground. Cooling and evaporation at the Huntington Power Plant consume another 2,400 acre feet/year (1,500 gpm). The remaining 2,300 acre feet (1,400 gpm) are discharged, with minimal interbasin transfer of water to streams. Mine water discharges generally meet required UPDES effluent limitations. The regulations require a mine operator to notify in writing whenever these limits are exceeded.

Mining operations have attempted to design the underground mine layout to avoid interception of fault conduit flow and interruption of stream channels. The operational portions of the mine are moving north away from the Straight Canyon Syncline and the Roans canyon Fault. Accordingly, inflow from the regional aquifer should remain stable. Barring interception of fracture related flow mine water inflow is expected to remain stable as old areas are abandoned and sealed. Approximately 80 percent of the flow will be derived from storage and 20 percent from discharge. Consumptive use is not anticipated to increase. Mine water discharge and ventilation losses 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 mine workings and re-establishment of the premining ground-water system. Some areas within the Deer Creek Mine have already been sealed following mining and are beginning to flood.

Diversion of spring flow from areas above the mine is considered to be at overall low risk. Interception of groundwater which feeds springs below the mine elevation are at greater risk for reduced flow.

Sediment control measures have been and will be designed, constructed and maintained to treat runoff from the minesite prior to discharge. These treatments will reduce contamination of surface waters.

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

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

REFERENCES

1. Beaver Creek Coal Company, Huntington #4 Mine, Annual Report, 1987.
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4. Cronquist, A., Holmgren, A.H. Holmgren, N.H., and Reveal, J.L., 1972. Intermountain Flora, Volume I. Hafner Publishing Company.
5. Cyprus-Plateau Mining Company, Star Point Mine PAP, pages 700-25
6. Danielson, T.W., Re Millard, M.D., and Fuller, R.H. 1981. Hydrology of the Coal-Resources Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Central Utah: U.S. Geological Survey, Water-Resources Investigations Report 81-539.
7. Fenneman, N.M., 1946. Physical Divisions of the United States: U.S. Geological Survey Map, Scale 1:7,000,000
8. Genwal Coal Company, Crandall Canyon Mine, Permit Application Package, 1989.
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10. Lines, G., 1984. The Ground-Water System and Possible Effects of Underground Coal Mining in the Trail Mountain Area. Central Utah: U.S. Geological Survey, Open-File Report 84-067.
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12. Mundorff, J.D., 1972. Reconnaissance of Chemical Quality of Surface Water and Fluvial Sediment in the Price River Basin, Utah: State of Utah, Dept. of Natural Resources, Technical Publication No. 39, 55 pp.

13. Ponce, S.L., and Hawkins, R.H. 1978. Salt Pickup by Overland Flow in the Price River Basin: Utah Water Resources Bulletin, Vol. 14, No. 5.
14. Waddell K. M. et al; Hydrology of the Price River Basin, Utah with Emphasis on Selected Coal-Field Areas. U.S. Geological Survey Water Supply Paper 2246, 1986.
15. PacifiCorp, Cottonwood/Wilberg Mine, Permit Application Package 1986.
16. PacifiCorp, Deer Creek Mine, Permit Application Package 1986.
17. PacifiCorp, Des-Bee-Dove Mine, Permit Application Package, 1985.
18. PacifiCorp, Hydrologic Monitoring Annual Reports for 1979 through 1988.
19. PacifiCorp, 1993 Annual Report.

Appendix A

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

ss.

County of Emery,)

I, Kevin Ashby, on oath, say that I am the Publisher of the Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and that the first publication was on the 19th day of April, 1994 and that the last publication of such notice was in the issue of such newspaper dated the 10th day of May, 1994.



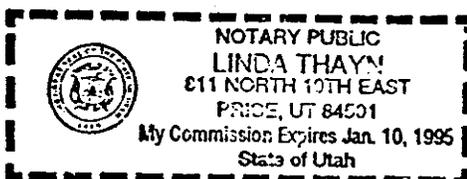
Kevin Ashby - Publisher

Subscribed and sworn to before me this 10th day of May, 1994.



Notary Public My commission expires January 10, 1995 Residing at Price, Utah

Publication fee, \$330.00



NOTICE

PacifiCorp, an Oregon Corporation, One Utah Center, 201 South Main, Salt Lake City, Utah 84140, hereby announces its intent to file an application for an amendment of a Coal Mining Permit for the Deer Creek Coal Mine with the Division of Oil, Gas and Mining under the laws of the State of Utah and the Office of Surface Mining. The amendment involves the addition of approximately 2,370 acres of leased property to the Deer Creek Mine permit area.

A copy of the complete application is available for public inspection at the Emery County Recorder's Office, Emery County Courthouse, Castle Dale, Utah 84513.

Written comments on the application should be submitted to the State of Utah, Division of Oil, Gas and Mining, 355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah 84180-1203. Said comments must be submitted within thirty (30) days from the date of last publication of this notice.

The area to be mined is contained on the USGS 7.5-minute "Rilda Canyon" quadrangle map. A map depicting the general area of the Deer Creek Mine is published herewith.

The Mine Permit Extension Area includes one (1) State of Utah Coal Lease (ML-22509), three (3) complete Federal Coal Leases (U-7653, U-47977 and SL-050862) and the southern portion of Federal Coal Lease U-06039.

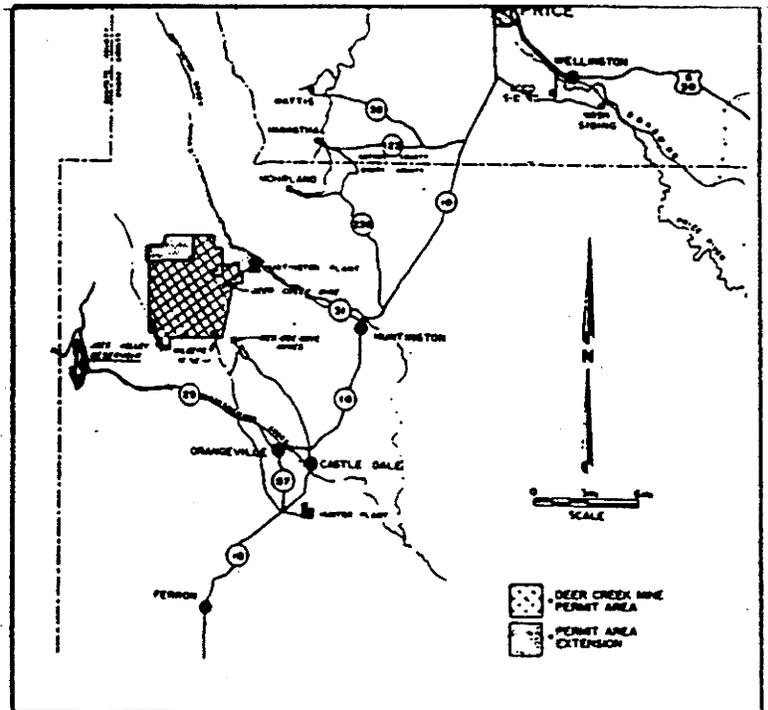
The extension area is more particularly described as follows:

<u>Township 16 South, Range 7 East, SLM, Utah</u>		
Section 28	W1/2SW1/4	80 Acres
Section 29	S1/2	320 Acres
Section 30	SE1/4	160 Acres
Section 31	All	411.6 Acres
Section 32	All	640 Acres
Section 33	W1/2NW1/4, NW1/4SW1/4	120 Acres

<u>Township 16 South, Range 6 East, SLM, Utah</u>		
Section 36	All	640 Acres

All together containing 2,371.6 Acres, more or less.

Published in the Emery County Progress April 19, 26, May 3 and 10, 1994.





United States Department of the Interior

BUREAU OF LAND MANAGEMENT
 UTAH STATE OFFICE
 324 SOUTH STATE, SUITE 301
 SALT LAKE CITY, UTAH 84111-2303

3453
 SL-050862
 U-7653
 (U-942)

CERTIFIED MAIL
 RETURN RECEIPT REQUEST

JUN 20 1986

DECISION

Utah Power and Light Company	:	Coal
P.O. Box 899	:	SL-050862- U-24069- U-24070 and
Salt Lake City, UT 84110	:	U-7653

Assignment Approved
Assignment of Sublease Approved
Bonds Accepted

On September 3, 1985, an assignment of coal lease SL-050862-U-24069-U-024070 and an assignment of a sublease of U-7653, dated August 27, 1985, between Utah Power and Light Company, as assignee, and WA Land Company, as assignor, were filed in this office.

Satisfactory evidence of the qualifications and holdings of Utah Power and Light Company has been filed, and the lease accounts are in good standing. The assignments appear to meet the requirements of the regulations and are hereby approved effective July 1, 1986. Approval of these assignments does not constitute approval of any of the terms therein which may be in violation of the lease terms.

On June 13, 1986 two lease bonds were filed (Nos. 9291562 and 9291563) in the amounts of \$10,000 and \$5,000 covering coal leases U-7653 and SL-050862, respectively, with Utah Power and Light Company, as principal and American Casualty Company, as surety. These bonds have been examined, found to be satisfactory, and are accepted effective the date of filing.

ACTING

William D. Bush
 Chief, Minerals
 Adjudication Section



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
UTAH STATE OFFICE
324 SOUTH STATE, SUITE 301
SALT LAKE CITY, UTAH 84111-2301

3453
U-47977
(U-942)

DWT

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

JUN 17 1986
RECEIVED
JUN 18 1986
SYS. & RES. PLANNING

DECISION

Utah Power and Light Company
P.O. Box 899
Salt Lake City, UT 84110

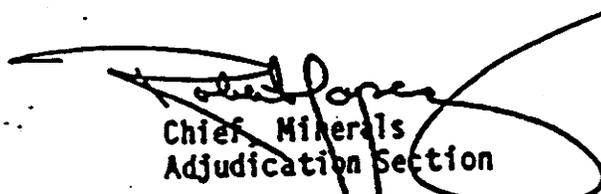
Coal Lease
U-47977

Assignment Approved
Bond Accepted

On September 3, 1985, an assignment of coal lease U-47977 dated August 17, 1985, between Utah Power and Light Company, as assignee, and W.A. Land Company, as assignor, was filed in this office.

Satisfactory evidence of the qualifications and holdings of Utah Power and Light Company has been filed, and the lease account is in good standing. The assignment appears to meet the requirements of the regulations and is hereby approved effective July 1, 1986. Approval of the assignment does not constitute approval of any of the terms therein which may be in violation of the lease terms.

As required by the regulations in 43 CFR 3472.2(a), a lease bond (No. 928 47 99) in the amount of \$1,048,200 covering coal lease U-47977, with Utah Power and Light Company, as principal, and American Casualty Company, as surety was filed in this office on June 10, 1986. The bond has been examined, found to be satisfactory and is accepted effective as of the date of filing.


Chief Minerals
Adjudication Section

Utah State Office
University Club Building
100 East South Temple
Salt Lake City, Utah 84111

353
SL-631
21
(1-2-2)

1979
DEC 1 3 1979

DL 19

DECISION

Utah Power and Light Company	:	Coal Leases
P. O. Box 899	:	Salt Lake 051221, Utah 05039
Salt Lake City, Utah 84110	:	Utah 014275, Utah 024317,
	:	and Utah 024319

Assignments of Coal Leases Approved
Bond Rider Accepted

On May 25, 1979, assignments of coal leases Salt Lake 051221, Utah 05039, Utah 014275, Utah 024317, and Utah 024319, entered into on May 18, 1979, between Utah Power and Light Company as assignee, and Peabody Coal Company as assignor, were filed in this office for approval.

Satisfactory evidence of the qualifications and holdings of Utah Power and Light Company is on file, and the lease accounts are in good standing. The assignments appear to meet the requirements of the regulations and are hereby approved effective January 1, 1980. Approval of the assignments does not constitute approval of any of the terms therein which may be in violation of the lease terms.

Utah Power and Light Company and its surety have also filed a rider to statewide coal bond, No. SL-6239407 which assumes the liability for the necessary reclamation required as a result of operations on the above-mentioned coal leases. The rider is satisfactory and is hereby accepted effective December 10, 1979.

/S/ L. POLLUCK
Chief, Minerals Section

Enclosures
Assignments

cc: Area Mining Supervisor (2)
Accounts

SSradley:al:12/11/79



STATE OF UTAH
NATURAL RESOURCES
State Lands & Forestry

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Ralph A. Miles, Division Director

State Office Building • Salt Lake City, UT 84114 • 801-533-5381

November 12, 1985

RECEIVED
NOV 1 1985

Utah Power and Light Company
1407 West North Temple
Salt Lake City, UT
84110

MINING AND
EXPLORATION

Gentlemen:

RE: ML 22509

The Director, on September 30, 1985, approved the assignment of the above-numbered lease to you by WA Land Company, who reserves 2 percent overriding royalty, in addition to 2 percent overriding royalty previously reserved.

The State assumes no responsibility in collecting or distributing overriding royalty.

Our records have been noted, and we herewith enclose the original lease and assignment..

Yours very truly,



DONALD G. PRINCE
ASSISTANT DIRECTOR

bp

Enclosures

STATE OF UTAH)
COUNTY OF SALT LAKE) ss.

On the 27th day of August, 1985, personally appeared before me Richard F. Conerty, the signer of the foregoing Assignment, who being by me duly sworn, did say that he is the President of WA LAND COMPANY and that the foregoing Assignment was signed on behalf of said corporation by authority of its bylaws or a resolution of its board of directors, and said Richard F. Conerty acknowledged to me that said corporation executed the same.

James W. Christensen
NOTARY PUBLIC, residing in
Salt Lake County, Utah

My commission expires:

9-30-89.



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor

Ted Stewart
Executive Director

James W. Carter
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340
801-359-3940 (Fax)
801-538-5319 (TDD)

June 29, 1994

FIELD(001)

Re: Determination of Completeness, PacifiCorp, Deer Creek Mine, Rilda Canyon Lease Addition, ACT/015/018-94A, Folder #2, Emery County, Utah

Dear Mr. FIELD(002):

PacifiCorp is proposing to expand its current underground coal mining operation in Emery County. The expansion involves adding State Lease ML-22509, Federal Leases SL-050862, U-47977, U-7653 and a portion of U-06039, to the existing Deer Creek permit area. This expansion is known as the Rilda Canyon Tract Extension Area. The leases will be mined as an underground extension of the existing, approved, and currently operating Deer Creek Mine.

The Utah Division of Oil, Gas and Mining (Division) has completed a review of the Permit Application Package (PAP) for the Rilda lease addition. The Division has determined the plan to be complete. In compliance with Utah Coal Mining Rules R645-300-121.300, R645-300-121.310, R645-300-121.320 and the Utah Coal Mining Act (UMC Section 40-10-1 et seq), notice is hereby given to all appropriate agencies having a jurisdiction over or an interest in the area of the operations that a complete plan is available for public review.

The permit area is located in Emery County, Utah in the Wasatch Coal Field approximately 10 miles northwest of the town of Huntington, Utah.

The following areas comprise the proposed permit area:

Township 16 South, Range 7 East, SLBM

Section 28: W1/2SW1/4
Section 29: S1/2
Section 30: SE1/4
Section 31: All
Section 32: All
Section 33: W1/2NW1/4, NW1/4SW1/4

Township 16 South, Range 6 East, SLBM

Section 36: All

Page 2
Rilda Canyon Lease Addition
ACT/015/018-94A
June 29, 1994

The Division of Oil, Gas and Mining has undertaken a technical review to determine whether the plan meets all the criteria of the Permanent Program Performance Standards according to the requirements of UCA, Section 40-10-1 et seq and Utah Admin. R. 645-100 et seq.

Upon completion of the technical review of the plan (anticipated to be circa July 15, 1994), a decision will be made as to approval or disapproval of the permit application. This plan is available for public review at: Division of Oil Gas and Mining, 355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah 84180-1203.

Comments of the PAP may be addressed to:

James W. Carter, Director
Division of Oil, Gas and Mining
355 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

For further information, please contact me at the above address or phone 538-5340.

Sincerely,



Daron R. Haddock
Permit Supervisor

DH/mbm
cc: Price Field Office
RILDADOC.DEE

GENERAL ADDRESS LIST FOR MAILING

Thomas E. Ehmet, Acting Director
Office of Surface Mining
Reclamation and Enforcement
505 Marquette N.W., Ste. 1200
Albuquerque, NM 87102

Richard E. Dawes, Chief
Division of Federal Programs
Office of Surface Mining
1999 Broadway, Ste. 3320
Denver, CO 80202-5733

Mark Bailey, Area Manager
Price River Resource Area
Leased Operations
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900 North 700 East
P. O. Box AB
Price, UT 84501

Alan Rabinoff, Chief
Mining Law and Solid Minerals
Bureau of Land Management
324 South State Street
P. O. Box 45155
Salt Lake City, UT 84145-0155

Robert D. Williams, Asst. Field Supervisor
U. S. Fish & Wildlife Service
Ecological Services
Lincoln Plaza
145 E. 1300 S., Ste. 404
Salt Lake City, UT 84115

George Morris, Forest Supervisor
U.S. Forest Service
Manti-LaSal National Forest
599 West Price River Road
Price, UT 84501

Robert Morgan, State Engineer
Utah Division of Water Rights
Department of Natural Resources
1636 West North Temple
Salt Lake City, UT 84116

Brent Bradford, Deputy Director
Office of the Executive Director
Department of Environmental Quality
168 North 1950 West
P. O. Box 148810
Salt Lake City, UT 84114-4810

Robert Valentine, Interim Director
Utah Division of Wildlife Resources
1596 West North Temple
Salt Lake City, UT 84116

Max J. Evans, Director
Utah Division of State History
300 Rio Grande
Salt Lake City, UT 84101

Scott Hirschi, Director
Division of State Lands and Forestry
3 Triad Center, Ste. 400
355 West North Temple
Salt Lake City, UT 84180-1204

Bill Howell
Southeastern Utah Association
of Local Governments
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Price, UT 84501

Bryant Anderson
Emery County Planning and Zoning
P. O. Box 297
Castle Dale, UT 84513

Ronald P. Parkin
State Mine Inspector
Industrial Commission of Utah
College of Eastern Utah
451 East 400 North
Price, UT 84501

Carolyn B. Wright
Research Analyst
Governor's Office of Planning and Budget
Government Relations Dept
State Planning Coordinator Office
116 State Capitol
Salt Lake City, UT 84114

Barclay Gardner
Dept of Community and Economic Development
324 South State Street, Ste. 500
Salt Lake City, UT 84111

Mike Schwinn
District Engineer
U.S. Army Corps of Engineers
1403 South 600 West
Bountiful, UT 84010

Gary L. Roeder
District Conservationist
U.S. Soil Conservation Service
350 North 400 East
Price, UT 84501

GENERAL ADDRESS LIST FOR MAILING (Cont'd)

William P. Yellowtail, Jr.
Regional Administrator
Environmental Protection Agency
999 18th Street
Denver Place, Ste. 500
Denver, CO 80202-2405

Ted Stewart
Executive Director
Dept. of Natural Resources
1636 West North Temple, Ste. 316
Salt Lake City, UT 84116-3193

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

ss.

County of Emery,)

I, Kevin Ashby, on oath, say that I am the Publisher of the Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and that the first publication was on the 19th day of April, 1994 and that the last publication of such notice was in the issue of such newspaper dated the 10th day of May, 1994.



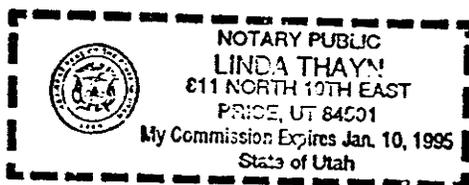
Kevin Ashby - Publisher

Subscribed and sworn to before me this 10th day of May, 1994.



Notary Public My commission expires January 10, 1995 Residing at Price, Utah

Publication fee, \$330.00



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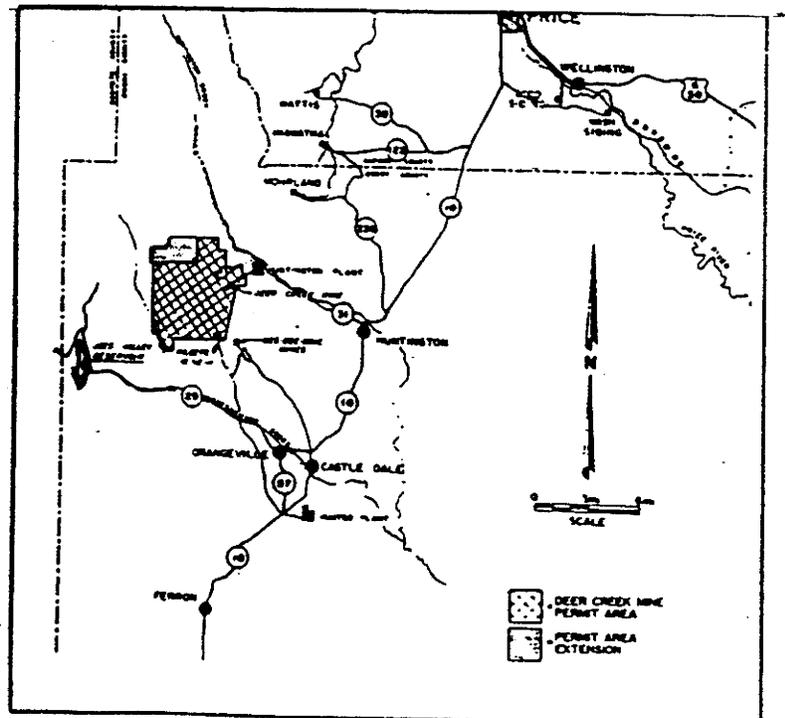
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Section 36	All	640 Acres

All together containing 2,371.6 Acres, more or less.
Published in the Emery County Progress April 19, 26, May 3 and 10, 1994.



REPLACES AMERICAN CASUALTY COMPANY
BOND NO. 9272158

Bond Number: 400 JN 6140
Permit Number: ACT/015/018
Deer Creek Mine

EXHIBIT "B"

SURETY BOND
(FEDERAL COAL)

THIS SURETY BOND entered into and by and between the undersigned PERMITTEE, and SURETY company, hereby jointly and severally bind ourselves, our heirs, administrators, executors, successors and assigns unto the State of Utah, Division of Oil, Gas and Mining (DIVISION), and the U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSM) in the penal sum of TWO MILLION & NO/100 ~~\$2,000,000.00~~ (Surety Bond Amount) for the timely performance of reclamation responsibilities of the permit area described in Exhibit "A" of this Reclamation Agreement.

This SURETY BOND will remain in effect until all of the PERMITTEE's reclamation obligation have been met and released by the DIVISION and is conditioned upon faithful performance of all of the requirements of the Act, the applicable rules and regulations, SMCRA, the approved permit and the DIVISION.

The SURETY will not cancel this bond at any time for any reason, including non-payment of premium or bankruptcy of the Principal during the period of liability.

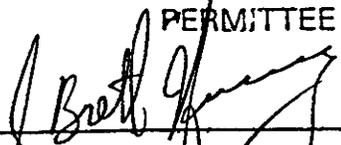
The SURETY and their successors and assigns, agree to guarantee the obligation and to indemnify, defend, and hold harmless the DIVISION and OSM from any and all expenses which the DIVISION and OSM may sustain as a result of the PERMITTEE's failure to comply with the condition(s) of the reclamation obligation.

The SURETY will give prompt notice to the PERMITTEE and to the DIVISION and OSM of any notice or action involving insolvency or bankruptcy of the SURETY, or alleging any violations of regulatory requirements which could result in suspension or revocation of the SURETY's license in this state. In the event the Cooperative Agreement between the DIVISION and OSM is terminated, then the portion of the bond covering the Federal Lands will be payable only to the United States, Department of Interior, Office of Surface Mining.

Terms for release or adjustment of this BOND are as written and agreed to by the DIVISION and the PERMITTEE in the RECLAMATION AGREEMENT incorporated by reference herein, to which this SURETY AGREEMENT has been attached as Exhibit "B".

IN WITNESS WHEREOF, the PERMITTEE has hereunto set its signature and seal
this 31st day of July, 1994.

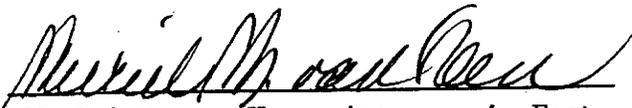
PACIFICORP

By:  PERMITTEE
Title: President, Interwest Mining Company
A wholly-owned subsidiary of PacifiCorp
and Managing Agent

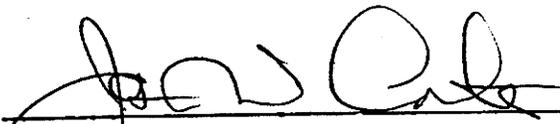
IN WITNESS WHEREOF, the SURETY has hereto set its signature and seal
this 1st day of July, 1994.

ST. PAUL FIRE AND MARINE INSURANCE COMPANY

SURETY

By: 
Title: Muriel M. van Veen, Attorney-in-Fact

ACCEPTED BY THE STATE OF UTAH
this 16th day of September, 1994.

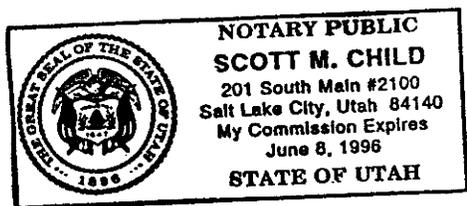

James W. Carter, Director
Division of Oil, Gas and Mining

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 PERMITTEE is a corporation, the Agreement shall be executed by its duly authorized officer.

ACKNOWLEDGEMENT OF CORPORATION - PERMITTEE

On this 31ST day of JULY, 1994, before me, a Notary Public in and for the County of SALT LAKE, in the state of UTAH, appeared J. BRETT HARVEY to me personally known who, being by me duly sworn, did say that he/she is J. Brett Harvey, President of Interwest Mining Company, a wholly-owned subsidiary of PacifiCorp and managing agent, the corporation (PERMITTEE) named in and which executed the within instrument, and that the seal affixed to said instrument is the corporation seal of said corporation, and that said instrument was signed, sealed and delivered in behalf of said corporation by authority of its Board of Directors, and he/she as such officer, acknowledged said instrument to be the free act and deed of said corporation for the uses and purposes of said instrument as therein set forth.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal on the day, month, and year aforesaid.



Scott M. Child
Notary Public in and for said
County and State

My Commission Expires:

6-8-96

AFFIDAVIT OF QUALIFICATION
FOR SURETY COMPANIES

STATE OF OREGON }
COUNTY OF MULTNOMAH } SS

Muriel M. van Veen
..... BEING FIRST DULY SWORN, ON OATH DE-
POSES AND SAYS THAT HE IS THE ATTORNEY-IN-FACT OF SAID COMPANY,
AND THAT HE IS DULY AUTHORIZED TO EXECUTE AND DELIVER THE
(OFFICER OR AGENT)
FOREGOING OBLIGATIONS: THAT SAID COMPANY IS AUTHORIZED TO EXE-
CUTE THE SAME AND HAS COMPLIED IN ALL RESPECTS WITH THE LAWS OF
UTAH IN REFERENCE TO BECOMING SOLE SURETY UPON BONDS UNDER-
TAKINGS AND OBLIGATIONS.

SUBSCRIBED AND SWORN TO BE-
FORE ME, THIS 1st DAY OF
July, A.D., 19 94

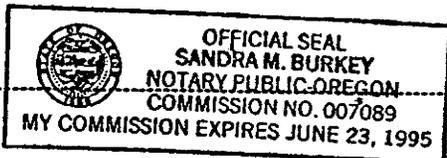
Muriel M. van Veen
.....
(SIGNATURE OF OFFICER OR AGENT)

Sandra M. Burkey
.....
(SIGNATURE OF NOTARY PUBLIC)

Troutdale, Oregon
.....
(RESIDENCE)

(SEAL)
MY COMMISSION EXPIRES:

(SURETY SEAL)



(THIS FORM REQUIRED TO BE FILLED
OUT BY SECTION 31-24-3, UCA 1953)

CERTIFIED COPY NO.

For verification of the authenticity of this Power of Attorney, you may telephone toll free 1-800-421-3880 and ask for the Power of Attorney Clerk. Please refer to the Certificate of Authority No. and the named individual(s).

1749236

F-12039

GENERAL POWER OF ATTORNEY - CERTIFIED COPY
(Original on File at Home Office of Company) (See Certification)

KNOW ALL MEN BY THESE PRESENTS, That St. Paul Fire and Marine Insurance Company, a corporation organized and existing under the laws of the State of Minnesota, having its principal office in the City of St. Paul, Minnesota, does hereby constitute and appoint:

Daniel J. Sloan, Thomas M. Pearson, Muriel M. Van Veen, Richard A. Stevens, individually, Portland, Oregon

its true and lawful attorney(s) in fact to execute, seal and deliver for and on its behalf as surety, any and all bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof which are or may be allowed, required or permitted by law, statute, rule, regulation, contract or otherwise.

NOT TO EXCEED IN PENALTY THE SUM OF FIFTY MILLION DOLLARS (\$50,000,000) EACH

and the execution of all such instrument(s) in pursuance of these presents, shall be as binding upon said St. Paul Fire and Marine Insurance Company, as fully and amply, to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at its principal office.

This Power of Attorney is executed, and may be certified to and may be revoked, pursuant to and by authority of Article V, Section 6(C), of the By-Laws adopted by the Shareholders of ST. PAUL FIRE AND MARINE INSURANCE COMPANY at a meeting called and held on the 28th day of April, 1978, of which the following is a true transcript of said Section 6(C):

- (1) The President or any Vice President, Assistant Vice President, Secretary or Service Center General Manager shall have power and authority to appoint Attorneys-in-fact, and to authorize them to execute on behalf of the Company and attach the Seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings obligatory in the nature thereof, and
- (2) To appoint special Attorneys-in-fact, who are hereby authorized to certify in copies of any power-of-attorney issued in pursuance of this section and/or any of the By-Laws of the Company, and
- (3) To remove, at any time, any such Attorney-in-fact or Special Attorney-in-fact and revoke the authority given him.

Further, this Power of Attorney is signed and sealed by facsimile pursuant to resolution of the Board of Directors of said Company adopted at a meeting duly called and held on the 5th day of May, 1959, in which the following is a true transcript:

"Now therefore the signatures of such officers and the seal of the Company may be affixed to any such power of attorney or any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached."

IN TESTIMONY WHEREOF, St. Paul Fire and Marine Insurance Company has caused this instrument to be signed and its corporate seal to be affixed by its authorized officer, this 30th day of November, A.D. 1991.

ST. PAUL FIRE AND MARINE INSURANCE COMPANY

Michael B. Keegan
MICHAEL B. KEEGAN, Secretary



STATE OF NEW JERSEY) ss.
County of Somerset

On this 23rd day of February, 1994, before me came the individual who executed the preceding instrument, to me personally known, and being by me duly sworn, said that he/she is the therein described and authorized officer of St. Paul Fire and Marine Insurance Company; that the seal affixed to said instrument is the Corporate Seal of said Company; that the said Corporate Seal and his/her signature were duly affixed by order of the Board of Directors of said Company.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal, at the township of Bedminster, New Jersey, the day and year first above written.



Linda Smethers

LINDA SMETHERS, Notary Public, Middlesex, NJ
My Commission Expires December 16, 1996

CERTIFICATION

I, the undersigned officer of St. Paul Fire and Marine Insurance Company, do hereby certify that I have compared the foregoing copy of the Power of Attorney and affidavit and the copy of the Section of the By-Laws of said Company as set forth in said Power of Attorney, with the ORIGINALS ON FILE IN THE HOME OFFICE OF SAID COMPANY, and that the same are correct transcripts thereof, and of the whole of the said originals, and that the said Power of Attorney has not been revoked and is now in full force and effect.



IN TESTIMONY WHEREOF, I have hereunto set my hand this

1st July 1994
day of July, 1994

Roy F. Seymour

ROY F. SEYMOUR, Asst. Secretary

Only a certified copy of Power of Attorney bearing the Certificate of Authority No. printed in red on the upper right corner is binding. Photocopies, carbon copies or other reproductions of this document are invalid and not binding upon the Company.

ANY INSTRUMENT ISSUED IN EXCESS OF THE PENALTY AMOUNT STATED ABOVE IS TOTALLY VOID AND WITHOUT ANY VALIDITY.

EXHIBIT "A"
PERMIT AREA
LEGAL DESCRIPTION

EXHIBIT "A"
PERMIT AREA

In accordance with the RECLAMATION AGREEMENT, the PERMITTEE intends to conduct coal mining and reclamation activities on or within the PERMIT AREA as described hereunder:

Total acres within the approved PERMIT AREA: 14,911.77

Total acres of DISTURBED AREAS within the Permit Area: 93.29

Map(s) showing the approved PERMIT AREA are attached and provided as:

General Location Map (Drawing No. CM-10860-DR)
Map 1-3: Mine Permit Area (Drawing No. CM-10367-DR)

Map(s) showing the DISTURBED AREAS within the approved Permit Area are attached and provided as:

Map 1-4: Disturbed Area Boundary (Drawing No. CM-10882-DR)
Map 1A: Surface Yard Map (Drawing No. DS202E)
Map 2: Waste Rock Storage Site (Drawing No: none)

Legal Description of BONDED AREA:

<u>Area</u>	<u>Location</u>	<u>Surface Owner</u>	<u>Acreage</u>
1. Mine Complex (Including overland conveyor, sediment pond, sewer absorption field, yard extension, truck loadout facilities in Elk Canyon, etc.)	Located in Deer Creek Canyon and situated within the NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 1, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 2, E $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 11 and SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ Section 10, T.17S., R.7E., SLM	Private, BLM, USFS, St. of Utah	44.6
2. Waste Rock Storage Site	Located approximately 1 mile East of the Huntington Power Plant off of state road 31 and situated within the E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 6, NW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 5, T.17S., R.8E., SLM	Private	48.69

NOTE: In the event that more than one bond is provided for the Permit Area, the Permittee must provide a map and legal description for each sub area of the Permit Area for which each bond is provided.